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Technological leadership systems and principal skills at the primary level: Is there a relevant evidence match?

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Abstract---The skills of leaders are highly value the technology leadership system in every educational institution. Likewise, achieving educational goals at the elementary school level certainly has to do with the principal's ability to influence his subordinates to work according to their rules and technological resources. This study examines the relationship between elementary school principals' skills and technological capabilities in advancing student learning outcomes. The data search will be carried out electronically on some data sources that actively discuss the issue of leadership and leadership in elementary schools in Indonesia from various artist contexts and applications. Our data have been analyzed using an economical approach to obtain valid and valid study answers. The review process involves testing the evaluation data and drawing conclusions that answer the problem with validity. We discuss the results of this study by concluding that the technology leadership system has reciprocal evidence relevant to principals' skills in elementary schools in Indonesia. Hopefully, these findings will shed new light on the development of primary school education.

Keywords---leadership, education, technology, principal, research evidences.

Introduction

Information and communication technology is part of the progress of human civilization, which is intended to improve the quality and welfare of humans through educational products and work ethic, which is currently following the development of the times (Papa, 2011). By digesting the phenomenon of the emergence of cutting-edge technology in the education sector and human resource development, the parties benefit greatly when they want to take advantage of this technology's application to increase the quality and productivity of educational work. Scientific evidence has proven that technological excellence, through its innovation power, proves its reliability with skills and benefits that, in principle, will positively impact improving human resources in the education sector (Abowitz & Toole, 2010). One of the impacts of the technological leadership system is those who play an essential role in developing human resources, such as at the basic education level. Many studies have proven the technology work system's reliability in improving the education system's governance towards development towards progress. Still, few have connected the country's technology leadership system and elementary school leadership skills. Therefore, the author wants to understand the correlation between technology leadership systems and basic education governance skills by reviewing published information sources from various application contexts nationally and internationally (Kagermann, 2015).

Along with revolution 4.0, the role of educational leadership determines the success of the organization they lead. Because the advantages of technology, when able to be utilized in achieving the goals of educational organizations such as elementary schools, are not limited to how to lead, but to how to involve technology and influence the many resources they lead to achieve the desired goals jointly (Rüttimann & Stöckli, 2016). In other words, technology has now become the backbone of the movement machine, where technology can provide connections between humans to one that allows every human activity, including in the field of education, to be more efficient. Indeed, challenges still exist, but when leaders can utilize technology to respond to all problems quickly, all the challenges and difficulties faced by the world of education will easily be solved. In addition, the educational governance system certainly has a strategic policy where when human resources that support essential education organizations can be distinguished from technological capacity, institutionally, this will have a tremendous impact in efforts to produce educational work productivity to achieve school goals (Liu et al. al., 2020). Improving the quality of primary education is even more critical because this is the forerunner where the empowerment program to improve the quality of human resources has been equipped from the beginning with a variety of essential skills and knowledge so that the continuation of primary education has quality standards in various skills including science which make education output base will be very high quality.

The difficulties of modern revolution 4.0 should be answered rapidly and precisely by all partners in the training climate to have the option to build the seriousness of the Indonesian country amidst the worldwide contest (Lu, 2017). "Key arrangements should be formed in different viewpoints going from organizations, fields of study, educational plan, assets, as well as the advancement of innovation focus programming apparatuses, innovative work to development." Working on the nature of schools to be preferable over the past execution is genuinely challenging. It has been an examination interest worldwide for quite some time. The test of school pioneers in working on the nature of understudy learning results will constantly be a fascinating focal point of instructive examination. As of late, the OECD (2016) detailed that 15% of low-gaining accomplishments were bound to come from varieties in financial circumstances, socioeconomics, and instructive foundation of understudies.

Simultaneously, the difficulties of learning accomplishment in the 21st century give novel open doors that have never existed, specifically the upsides of correspondence and data innovation. This peculiarity makes sense of the advancement of administration worldview changes, particularly regarding instructive authority, as well as the genuine circumstances in which the computerized world rules and valuable chances to make the most of it (Horváth & Szabó, 2019). The image above shows how the training states are great, and there is an exceptionally great expectation in schooling. In Japan, a teacher gives significant inquiries to his understudies. What are the desires of the understudies? Promptly with energy, the understudies answered, needing to turn into an instructor. The issue lies in instructive establishments in Indonesia, from rudimentary to auxiliary schools. These strategies are unfit to answer rapidly whenever there is a chance to develop the helping calling further to stay aware of instructive advancements in the computerized time. This one thing is frequently hindered by strategies in the school climate, bringing about the development of helpful position gatherings (Kergroach, 2017).

So anything that wants to carry out the policies that have been programmed by the Ministry of Research, Technology and Higher Education regarding the need for changes in the digital era in all educational institutions must be gradual for those who can carry out the needs of the digital era can be carried out and for those who are not able to be assisted with existing provisions in the government through agencies related in the educational environment (Caputo, E. L., & Reichert, F. F. 2020). The era of the Industrial Revolution 4.0 was marked by artificial intelligence, supercomputers, genetic engineering, nanotechnology, automatic cars, and innovation. These progressions happen at a remarkable rate that will affect the economy, industry, government, and legislative issues. In this period, it is progressively noticeable that the world has become a worldwide town (Rastogi, R., et al., 2018).

All the more significantly, Industrial upheaval 4.0 is a term that was first begotten in Germany in 2011 and was set apart by the computerized upset. This industry is a carefully associated everyday interaction that incorporates different kinds of innovation, from 3D printing to mechanical technology, which is accepted to increment efficiency. Before this, there had been three modern upsets set apart by the development of the steam motor and trains in 1750-1930, the creation of

power, correspondence gear, science, and oil in 1870-1900, and the development of PCs, the web, and cell phones in 1960 as of not long ago (Satya, 2018). The difficulties of modern upset 4.0 should be answered rapidly and precisely by all partners ready to expand the intensity of the Indonesian country amid rivalry. The capital is expected to enter the 21st 100 years and expert the current unrest 4.0 (Sima et al., 2020).

Administration in associations plays an enormous part in building connections among people and shaping hierarchical qualities utilized as the essential starting point for accomplishing hierarchical objectives. The initiative's impact on hierarchical viability should be visible as an immediate and roundabout administration impact (Baharun, 2017). The importance of a school can be deciphered by the head of the school or establishment where he gets and gives examples. The chief is an educator who can lead all current assets in a school so they can be used ideally to accomplish shared objectives (Wahjosumidjo, 2011). Moreover, as per Kamidin., et al (2010), chiefs who are knowledgeable about doing their entire orders, the simpler it is to give speed, comfort, exactness, and combination in giving execution administrations. The more an individual's work insight, the more advantages that will affect the broadness of information in the field of work and the more one's abilities will build (Soetjipto, 2007).

Present day upheaval 4.0 Kagerman et al. (2015) revealed that Industry 4.0 is the blend of Cyber-Physical System (CPS) and Internet of Things and Services (IoT and IoS) into current cycles, including gathering and activities and various cycles. CPS is an advancement to merge this current reality with the virtual world. Industry 4.0 was brought into the world from the chance of the fourth current turmoil. Siu et al., (2016) showed that the Year 2011 meant the primary authority use of the term Industry 4.0. Openness and displays of how it could help the association began to appear in the presentations. In 2013, the German gathering industry chose to place assets into Industry 4.0 cycles, and the German government extended funding, which provoked the creation of the Industry 4.0 Platform. In 2014, high-level thing creating practices and using LoT began to occur (Halimah et al., 2018).

Drive and head initiative are an understanding of "authority" from "trailblazer." A trailblazer is a person who leads. While power is happening, in another sense, etymologically, the term authority comes from "lead," which means to guide or guide. From "Pimpin" was considered the activity word "trailblazer," and that means to guide and ask for. Enyoghasi & Badurdeen (2021) states that the initiative is about course setting and motivating others to make the excursion to a better than ever condition of the school. The administration is tied in with overseeing authority and moving others to venture out and further develop the school association. The initiative is the way of behaving of a principal to direct, impact, and clarify for subordinates, start and keep up with bunch cohesiveness, steady disposition so every part can contribute really to the association to accomplish objectives. As authority in the field of schooling additionally has the comprehension that pioneers should have abilities in affecting, empowering, directing, coordinating, and activating other people who have to do with the execution and advancement of training and educating or preparing so movements of every kind can run successfully and productively. This will accomplish the

instructive and instructing objectives that have been set. The average initiative is future-arranged administration (Taufikurrahman, 2021).

Based on the explanation above and the problems we want to get where we want to get scientific evidence from various thoughts and views of technology leadership experts and the success of elementary school principals, then we want to examine some literature and other information as scientific evidence that has been published in many publications nationally and internationally. The problems above will not be answered without a more in-depth study to see the relationship between various contexts and the principal's ability to manage technology management for all functions to improve learning outcomes. Therefore, we try to do a more in-depth study and discussion, which we will present in the results and discussion section.

Method

This study is to obtain relevance in the form of scientific evidence to see the relationship between technology-based elementary school leadership systems and the success of school principals in carrying out educational functions and responsibilities (Kartal, 2016). To prove this, our search for scientific evidence visited many applications in the form of books and academic scientific work on technological leadership and skills possessed by elementary school principals, which we believe can answer the problems of this study (Hoppey & McLeskey, 2013). As for the literature search, we did on the history of technology, namely a search through the Google Scholar application using keywords according to the keywords of this study.

Furthermore, we found several scientific pieces of evidence and are ready to study them. Our research process involves, among others, existing qualitatively, coding data, and evaluating and concluding important things phenomenologically, namely efforts to gain some understanding from phenomenal data (Hammonds, 2017). At the same time, our report selects a literature review writing system in a qualitative study where we try to see the understanding of the technology leadership system and technology mastery for elementary school principals to improve the quality of learning outcomes and look for references in the form of opinions and views of experts (Tallantyre et al., 2022). So, in other words, this study is entirely dependent on secondary data, including the stages of implementing the study, which we started with problem formulation, then exposure to preliminary elaboration, searching for data for analysis, and final reporting (Dźwigoł, 2019). That is, among others, the explanation of this method and material section, which we started from the preliminary elaboration and study problems, continued with data searching, analyzing the data, testing the data for validity, and finally drawing conclusions before we reported the results in the format of writing a descriptive qualitative design scientific report.

Discussion

We presented the results of a review of scientific evidence from various journals and book publications that discuss the issue of technology leadership and principals' skills in optimizing their leadership at the elementary school level. In

this section, we will also discuss the critical points that we got from a series of studies of scientific evidence from various application contexts, all of which are to see the relevance between technology leadership systems and the ability of school principals to manage primary education.

Technological leadership and principal roles

The principal, in terms of functions and responsibilities, must be the driving force for all functions in the school, starting from the organizational management of the school's overall teaching and learning program, including the function of technology; in other words, leadership that has an impact on the empowerment of information and communication technology. This is because when the school's goals with all the capacity and human resources owned by the school when technology leadership is not carried out correctly, this risks the school's inability to achieve the primary goal. This is the following (Miroj et al., 2020). A similar idea also from Karamizadeh et al. (2020), which says that the role of the principal also includes the ability to distinguish technology, which in practice, technology can innovate all the potential of schools both in terms of management and learning, which in the end, when appropriately managed, is believed to improve performance. Leadership and ultimately able to create appropriate technology resources for achieving school goals as expected by the curriculum, the government, and students' parents. In his capacity as the principal's technology guard, the principal or educational leadership certainly provides resources and social and moral support to all school (Aprilana et al., 2017).

Furthermore, Saifurrahman et al., (2021) also argue that the principal as a school managerial leader is a determinant who must have skills in the use of technology, mainly when education is carried out in an era where technology is no longer a problem as an ordinary communication tool. However, he is a critical infrastructure that can innovate. The purpose of the school because with its very serviced role and function on credit, every school leader of course in addition to having insight and also the ability to apply technology to achieve its goals, namely to move all components and the educational community such as teachers, administrators, researchers and students to all of them must have the ability to adopt technology functions which are of course initiated and driven by the functions and systems of leadership in schools (Supartilah & Pardimin, 2021).

The principal's leadership cannot be separated from his capacity in the form of skills and other technology leadership knowledge; organizationally, he can invite all followers to achieve educational development goals as expected (Salimin et al., 2021). Thus, with the principal's capacity to form conditions that invite individual school community members to be actively involved in the process of achieving school goals by being ready to innovate and adapt themselves to various possible changes to achieve goals, then technological leadership in the educational leadership sector this includes various skills such as the ability to continuing education infrastructure managing existing human resources by paying attention to every person to continue to actively master and apply channels in informatics in all processes of achieving educational goals. So the overall capacity of principals with technological leadership they master will doubtful positive impact on learning to transfer teacher human resources how they can use technology

according to their needs, and they can also access all technology for self-development and educational professionalism, how to apply the skills that teachers have by continuously upgrading themselves with technological changes and being able to carry out learning as assigned to each teacher. This is the premise that it is essential to distinguish how teachers teach and apply information technology both in teaching work and to master computers as literacy in an era that requires all individuals to apply skills to technology (Ripki et al., 2020).

With the thought that teachers need to apply information technology both in the teaching and learning process today and to master technological literacy for professional development and to carry out teacher duties, Furthermore, when teachers are considered the key who must master technology, the school leadership must first understand how teachers must be able to apply technology both in terms of teaching and to achieve success in their duties. Furthermore, school leaders here need to play a very strategic role, namely being able to invite teachers to want to work with the challenge of using technology to improve their teaching and learning process effectively (Jones et al., 2015).

So when teachers and other school communities have played their role as part of the technology players, we can say that their leadership function and technological capabilities are recognized. Indeed, lately, many elementary school leaders have found that, on average, they do not have significant skills in the field of technology. However, because today's technology is the most critical part, we often see that technology often does not come from elementary school leaders but instead comes from those who the newly appointed teacher is, a generation that is indeed capable and was born when the technology existed. So in such conditions, the technological leadership of elementary school leaders is not always the foundation of hope. However, such conditions require collaboration on how the young teacher provides new support and contributions to strengthening the elementary school leadership level (Munir & Khalil, 2016).

The role of the school principal

Setting instructor limits on the use of information and communication technology is the principal's authority, although often, it is not fully capable of being carried out at the elementary school leadership level. The attention of school principals on technology is indeed not so intense in intermediate schools in Indonesia. Rahayu (2012) stated that the principal is the spearhead of education management in the education unit. They are an essential factor for school progress and, at the same time, are seen as people who are responsible for school progress. On the other hand, principals point out that, in the initial acquisition of a technology framework for principals, Fitriana et al. (2021) assessed that the school strategy in improving the learning quality of students started from how to lead a program of attention to technology for councils that were not educated on technology. It is hoped that with basic technology skills, they will have the choice to use technology for all work and self-development purposes for teachers. It is an observation that technology tools are not evenly accessible in elementary schools in Indonesia. So for that, school leadership who understands technology will benefit teachers and ultimately progress students. Therefore, educators need to

pay attention to the essence of technology in current professional career and train their students to primary skills and how to utilize different technological instruments for the future of elementary school students in Indonesia, especially in rural areas (Yang, 2014).

Therefore, pioneering primary school leadership seems to impact educators' enthusiasm for computer training and applications that support educational work. In addition, the perspective of principals and educators in Indonesia shows that school principals expect improvements to show teaching staff innovation, which is part of the main task of improving education quality. Therefore, it is essential to involve technology skills in teaching and educational experiences at the elementary level. This follows the perspective of Ahmadi (2017), who said that innovation improvement and staff preparation are essential to the administrator's innovation authority'. Writers also argue that mechanical education in today's society is emotional support in economies worldwide and results in the new data era. Therefore, by providing educators with the opportunity to gain enrollment at the school level, school pioneers not only influence and enable them to recognize and make an educational change but also provide resources to connect continuing gaps in the school environment in this way helping, to some degree, increasing hierarchical school boundaries (Permata & Fatkhurrohman, 2021).

Development of an ICT framework for school principals

Principals are now increasingly focused on supporting teachers by impartially providing technology facilities, for example, teacher workspaces with computer facilities and good frameworks, among many other computerized media, which are considered essential for the reconciliation of ICT in teaching and development experience. In Indonesia, the teacher council and school supervisors must have complete work equipment, including technology facilities. This is because they perceive the development of an ICT framework as an effective procedure for setting boundaries for educators to involve computers in their teaching and educational experience. Siregar & Nasution (2022) support that information technology at the elementary school level can be applied to improve the quality of learning through teacher creativity. The Indonesian Cemerlang House Association also distinguishes between the foundation of innovation and learning exercises that utilize innovation as a necessity to pursue six main types of choices (Muzahidin et al, 2020). Among these six options are an 'adequate innovation plan' and a 'hardware restoration plan.

It can be seen that pioneering schools in Indonesia are planning and providing multimedia platforms to empower technology coordination in education and learning. In addition, decision-making on acquiring technology foundations in Indonesia is participatory in a 'hierarchical perspective; this component of disseminated administrative practice works by rolling out the boundaries of authority, including educators in selecting the essential knowledge base and skills on what technology they need to educate and learn, then ensure participatory decision-making for achieving a vision of the future—state-funded schools (Kuncahyono et al., 2020). Equally interesting, this dynamic authority and methodological practice help educators appreciate and have a teacher council drive, which is a worthy inspiration for instructors to retain IT skills while

simultaneously offering educators better open doors to learning about what is to come in the future (Wahyuni et al., 2020).

Finally, we conclude the critical parts that we have mentioned in the results report and discussion section, which include, among other things, we see the technology that the principal has implemented at the elementary head level makes a variable that plays a role in achieving educational goals in elementary schools where the role of the principal is understanding and friends with technology can influence and invite the teacher council and school community including students to improve the quality of work and learning outcomes so that educational goals at the elementary level can be achieved optimally. Because of such a significant role owned by the principal, this is a pretty good opportunity when elementary schools want to improve the quality of learning, starting with skills and knowledge in technology. Moreover, this is all evidence in the field following what is claimed or understood by experts. How is the role of principals with high degrees in the field of information technology able to invite the academic community in elementary schools to be able to improve the quality of education. To achieve this, of course, there is a framework that must be passed, and with that, the principal has the opportunity to invite all teacher councils including ICT operators to share the view that solutions in the field of teaching and education in the future are greatly affected by which ends are applied both for purposes the work and professional development of each teacher council and the principal itself.

Conclusion

In this final section, we conclude from a series of studies of publications and other scientific evidence to gain an understanding of the problem of the study, which includes how the technological leadership system and computer skills of elementary school principals are any evidence that supports each other. So, after we have examined some scientific evidence, it is evident that in Indonesia today, primary school leaders are paying more and more attention to knowledge and technology leadership, which is an essential aspect of getting job promotions by improving teaching and student learning outcomes. Based on scientific evidence, we see that there is a very close relationship in the form of support for scientific studies where the higher the leadership level of the principal in science and technology, the more successful he is in carrying out managerial and academic functions in order to complete educational goals at the elementary school level.

In addition, we also see that the development of the educational profession, especially school principals, is prepared to be able to inspire and encourage and also influence their subordinates, namely the teacher council to want to be encouraged to master technology because only by increasing their technological skills, teachers and principals can innovate ways. -Means of achieving educational goals in primary schools. On the other hand, we also see that in Indonesia, in general, young teachers who are prepared with various technological skills, among others, make compelling teaching challenges at the elementary school level, especially in big cities. So we can conclude that the role of school principals and leadership in the field of technology is mutually beneficial and interconnected when the government hopes to improve the quality of education in

the hands of school principals who are committed to innovating and transforming education through assistance and use of technology. Not only the role of school principals at the elementary level but also the function can be optimized so that reforms and innovations in the field of education can be continued with self-development efforts with skills in technology and information knowledge, which today are core programs that must be succeeded even from the elementary school level. We certainly have limitations in carrying out this study. Therefore we expect support and supportive feedback for future improvements.

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