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TECHNOLOGY LEADERSHIP IN INDONESIAN JUNIOR HIGH SCHOOLS DURING THE POST-COVID ERA: A CASE STUDY OF SPIRITUAL DIMENSIONS

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Abstract

COVID-19 in Indonesia necessitated a shift from traditional face-to-face learning to technology-based distance learning. This transition also redefined the role of school principal who must lead change and work in new ways. This study aims to explore the new role of the principal as a technology leader and develop a technology leadership model in learning in the new normal era. Employing a qualitative approach with a single case study method, the study involved 20 participants, including 5 principals, 5 vice principals, 5 IT coordinators, and 5 subject teachers from five public junior high schools (SMP Negeri) in Surabaya, Indonesia.. The findings study show that school principal has a key role in keeping the school functioning well in the new normal era. This findings highlight the latest model of technology leadership in education by developing 5 dimensions of technology leadership from NETS-EL 2018 into 6 dimensions. The spiritual dimension makes technology leaders and teachers are more effective in leading schools during and after COVID-19. These findings specifically contribute to the development of a technology leadership framework and generally complement existing leadership theories.

Keywords: Leading school, new normal, online learning, spiritual, technology leadership.

Introduction

The influence of technology in education field has become increasingly pronounced with the presence of the COVID-19 pandemic, which has dramatically transformed the teaching and learning process between teachers and students. In the new normal period, school principals are leading their schools in ways they never envisioned. They teach from behind their laptops in an empty school building with no students. Technology is gradually dominating and becoming an essential component in classrooms. The school's management has changed. Schools rely heavily on technology, the development of new curricula, and novel forms of collaboration (Schleicher, 2018). Certainly, this transforms the principal's position, requiring them to navigate change and adapt to new ways of working.

In Indonesia, technology-based learning methods are supported by a Joint Decree by four Ministers through Circular Letter Number 4 of 2020. This decree has been in effect for more than five years, yet many obstacles remain. Concerning obstacles in the implementation of technology-based learning, Sincar (2013) explain that these obstacles come from (1) resistance to change due to human resource problems and rejection from senior teachers, (2) problems with unstable network infrastructure and expensive internet quota, (3) not all students have digital devices and the impact of the pandemic that parents must bear due to economic problems, and (4) the availability of standardized Learning Management System (LMS) applications.

According to Rateno (2019), the principal role has now become a technology leader in schools. However, this raises new questions, what is the role of the principal as a technology leader in the new normal era? What constitutes an effective technology leadership model? Thus, Given the rapid and sudden change in the learning process from face-to-face to online learning, preparing the principal to lead a school organization that is now digitally based is essential to conduct more in-depth research. To overcome existing obstacles, the principal as a technology leader needs to consider several factors, for example building multiuser and multicenter applications through open source (Microsoft Office 365) or a developing home-made system (e-learning). However, each option has its own advantages and limitations that must be carefully evaluated. The advantages of using LMS compared to e-learning adoption according to Aydin and Tirkes (2010) are related to trust, flexibility of use, data security, and innovation. LMS applications are preferred in the education system due to their perceived efficiency and effectiveness.

Principals must encourage instructors to shift their mindsets and adapt to the digital-based learning

process, which was previously conducted offline. According to Wicaksono and Setyowati (2022), the advantage of online learning is the flexibility to learn at any time and from anywhere. On the other hand, technology-based learning has been proven to reduce costs by eliminating the need for paper. However, online learning also presents several challenges, including reduced interaction between teachers and students, a lack of emotional connection and character education, and additional expenses for internet quota. In contrast, offline learning allows teachers to better monitor students and prevent cheating. However, online learning is often considered less engaging due to the way it is delivered and the limited use of innovative teaching methods. Therefore, a change in mindset is needed so that principals and teachers can adapt to digital-based learning and continue to innovate. Equally important, school principals as technology leaders must ensure improved data security in every application used to secure students and teacher data and disseminate ethical digital behavior responsible to teachers, students, and parents.

Prior making this article, the author have done preliminary study (using quantitative method) involving 250 teachers and 63 headmasters/principals from SMP Negeri in Surabaya. This study measured the influence of technology leadership on teacher's knowledge in technology-based teaching. The findings identified that technology leadership has significant positive effect on TPACK, with total impact of 0.735 (from principal's point view) and 0.643 (from teacher's point of view).

Table 1 is Test Results of the Influence of Principal and Teacher Technology Leadership on Teachers' Ability to Manage Technology-Based Teaching (TPACK).

Table 1
Test results

Relationship	T Statistics	P Values	Total Effects
Headmaster			
Technology Leadership → TPACK	16.866	0.000	0.735
Teachers'			
Technology Leadership → TPACK	13.517	0.000	0.643

Source: SmartPLS 3.0 data processing, 2022

From their research review, Chua and Chua (2017) stated that researchers agreed that e-learning research in the world of education is rare and further research is needed. Therefore, technology leadership is important and urgent to be studied aiming (1) to solve various problems of digital-based online learning in the new normal era and (2) knowing that technology leadership is important because principals have the responsibility to prepare their students for the future so that they master 21st-century skills. Hinsotroza et al. (2008 in Cox, 2008) stated that mastery of technology is a "life skill" that is fundamental for the future. Technology mastery is also an opportunity for economic development and a requirement for students to be able to be employed (employability) in the future.

In relation to that, technology leadership is one of the tools used to make organizational changes facilitated by the digital revolution. Therefore, principals must be willing to learn and adapt to the emergence e-leadership, electronic teams (e-teams), telework, electronic meetings (e-meetings), various online files, electronic reports (e-reports), electronic learning (e-learning), electronic surveillance (e-surveillance), and electronic development (e-development).

The empirical research gap is shown in Appendix 4 showing the implementation of technology in 63 public junior high schools in in Surabaya. The local education office, as the coordinator of all state schools in Surabaya, has launched more than 20 online applications aimed to help schools speeding up their administration process and improve the student learning and teaching process. However, the use of technology applications has yielded varying results across schools, despite the fact that all SMP Negeri in Surabaya have relatively similar infrastructure readiness and access to technology-based training. For instance, the Surabaya city government, through the education office as the regional coordinator, has ensured an even distribution of facilities and infrastructure—such as computers, servers, and essential equipment—to all SMP Negeri in Surabaya (see Appendix 3 for the list of tables

According to Jameson (2013), and Suprapti et al. (2020), studies on how school principals learn about their new roles and carry out technology leadership effectively is still very limited. It was revealed that many principals felt unprepared or lacked the necessary qualifications to integrate technology leadership into their schools. (Rateno, 2019). At the same time, Jameson (2013) emphasizes that studies on technology leadership are not only necessary but also critical. They help leaders, educators, and all stake-holders in the educational process to recognize the importance of adapting to rapid changes that occur exponentially. These advancements have significantly impacted education, making principal leadership a key factor in determining the success or failure of an institution. As leaders in an educational institution, the

school principal has great duties and responsibilities (B et al., 2023), thus, this study is crucial, as the continuous development of education requires school leadership that can effectively manage, organize, and administer the institution while maximizing the use of available resources.

Development of Leadership Theories

From a review of various existing leadership theories, it can be concluded that first the leadership study has experienced significant growth. In line with time and the progress of the era, leadership theory will continue to experience development. Second, all perspectives on leadership have presented their uniqueness and strengths, including their limitations. To understand leadership properly, the author does not focus on a single theory. Instead, I must examine various existing approaches to gain a broader understanding of leadership while continuously refining the theory over time. This ensures a flexible leadership concept that can adapt to different situations and eras.

There are differences between the leadership theories that emerged before the pandemic and after the pandemic. In the era of the COVID-19 pandemic, where the economic, social, and political conditions around the world has extremely changed, leaders in all parts of the world face a 'VUCA World' (volatile, uncertain, complex, and ambiguous). The organizations they lead face an ever-changing environment, unpredictable things, and problems that are complex, complicated, interrelated to one another, and full of obscurity. Therefore, organization need leaders who are agile, super flexible, respond quickly, and decisive, but must be more humane, collaborative (high coordination), and innovative (entrepreneurial).

Several leadership practices in organization during new normal era are VUCA leadership (Shufutinsky & Long, 2020), decisive leadership (Saidi, 2020), transformational leadership (Aziyah, 2020; Suprapti, 2020), digital leadership (Corte, 2019; Basit, 2020), situational leadership (Fransisco,2020), entrepreneurial leadership (Soehari, 2020), cooperative leadership (Munoz, 2019), and spiritual leadership (Houston, 2008). Thus, a transformational approach could progress instructive educate, bring approximately advantageous alter, and offer assistance partners and understudies realize their full potential (Okunlola, 2024; Green et al., 2013). In accomplishing this, Okunlola, (2024) contended that technology adjustment is what Nigerian society ought to proceed to enhance and progress instruction. Accomplishing critical breakthroughs in computerized innovation appropriation in school administration will be troublesome unless school principals lead from the front by illustrating computerized innovation capacity. Studies have revealed several leadership approaches that emerged during the COVID-19 pandemic and new normal era, which are considered more relevant to the situation of society and organizational conditions in the new normal era.

Hypotheses Development

This study aimed to investigate the principal's new position as a technology leader and create a model of technology leadership in the new normal period. The goals, competencies, and leadership responsibilities needed to achieve this desired future are elaborated. School leaders play an important role in providing an infrastructure that is conducive to the use of educational technologies (Tan, 2010; Flanagan & Jacobsen, 2003).

This qualitative research seeks to answer the following research questions:

RQ1: What role does the school principal's technological leadership play in bringing digital-based learning into schools during the new normal period?

RQ2: What is the technology leadership model in learning in the new normal era at leading public Junior High Schools in Surabaya, Indonesia?

Research Methods

This study seeks to investigate the role of school principals' technology leadership and how they develop technology leadership models in implementing digital-based learning in schools during the new normal period.

This study employs a single case study research method. This method is an appropriate strategy if the main question of a study contains elements of how and why. Case studies can be used by researchers to control the events that will be studied such as the process of organizing and compiling research data, real events in an individual's experience (Creswell, 2012).

The role of technology leaders in schools was be analyzed based on the technology leadership standard from NETS-EL (2018), consisting of five dimensions of technology leadership, namely:

Figure 1. Education leader
Sources: ISTE - iste.org

1. ***Equity & Citizenship advocate***: Principals use technology to increase equality and diversity, provide insight and digital awareness to carry out digital activities that are responsible to all school members.
2. ***Visionary Planner***: Principals involve stakeholders in building a common vision for technology-based learning.
3. ***Empowering Leader***: Principals motivate teachers and students to use technology innovatively to enrich the teaching and learning process.
4. ***System Designer***: The principal builds an IT team and system to implement technology that can support the learning process**.**
5. ***Connected Learner***: The principal as a role model and driver of continuous professional learning for himself and others.

The participants of this study were selected using a purposive sampling approach based on two criteria: (1) Principals who served at leading state junior high schools (high IT application usage), and (2) high-achieving principals. According to the Surabaya City Education Office, the five schools chosen for this study are among those in Surabaya, Indonesia, with high IT application usage implementation. These schools are SMP Negeri 1 Surabaya, SMP Negeri 6 Surabaya, SMP Negeri 19 Surabaya, SMP Negeri 22 Surabaya, and SMP 2 Negeri 8 Surabaya, respectively. The reason the researcher selected these SMPN schools managed by the Surabaya City Government as the research sample is that Surabaya, under the leadership of Mrs. Tri Risma Harini for eight years, received the Smart City designation. A city with the Smart City designation is recognized for effectively and efficiently managing its resources to address various urban challenges. This is achieved through innovative, integrated, and sustainable solutions that enhance infrastructure and city services, ultimately improving the quality of life for its citizens through technology (Sidik, 2017).

This study employed data collection methods using historical records, questionnaires, direct observation, documentation, and in-depth interviews. The interviews were performed face-to-face using the open-ended method. In-depth interviews in this research were conducted by involving 20 informants consisting of five school principals, five vice principals for curriculum, five IT coordinators, and five subject teachers. The questions were prepared based on a literature review on the topic under study, which is related to the five dimensions of technology leadership concerning the 2018 NETS-EL published by ISTE (2018), including (1) Equity and Citizenship Advocate, (2) Visionary Planner, (3) Empowering Leaders, (4) System Designer, and (5) Connected Learner. Each dimension has sub-dimensions that have been adapted to the education conditions in Indonesia, especially in Surabaya, and statements have been adjusted to make it easy to understand.

The analysis technique used in this study is thematic analysis, which was supported the data processing results using NVIVO software. For data triangulation, data were collected from principal, vice principal and school IT coordinator and teachers. In addition, triangulation were was also carried out by involving 2 people in pairs when conducting in-depth interviews to prevent missing information that can be received from respondents. For triangulation method, this study integrates multiple data collection methods, including surveys, in-depth interviews, field observations, supporting documents from schools, focus group discussions (Sheppard & Brown, 2014).

According to Green et al. (2013), triangulation can also be used to establish the consistency of cross-methods, such as observation and interviews or the use of the same method, such as interviews with several informants. In addition it also pays attention to the principles of transferability, dependability, and confirmability. The following is the methodology process of this study:

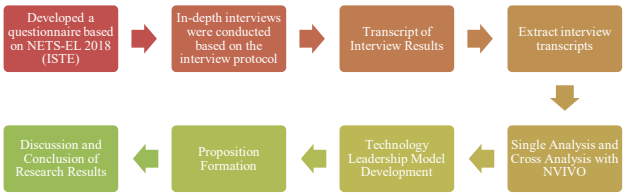

Figure 2. Research process
Source: Data processed, 2022

Results and Discussion

In-depth interviews were conducted with five leading principals of the following schools: SMPN 1, SMPN 6, SMPN 19, SMPN 22, and SMPN 28 Surabaya. The data obtained from in-depth interviews resulted in a transcript. From the transcript, the results of a single analysis were compiled according to the answers from each principal. A summary of the single study can be seen in Appendix 1. In the next stage, the single analysis results were tested using Word Cloud analysis in the NVIVO application to identify key terms in each dimension, which were then interpreted based on the test results. By combining the findings from the single analysis and NVIVO testing, common patterns across all schools, as well as the unique characteristics of each school, were identified. These findings are summarized in Appendix 2.

Technology Leadership Model Development

Figure 3 shows the dimensions of technology leadership in digital learning based on the single analysis and cross-analysis results. Dimension 1 talks about equity and citizenship advocacy, which emphasizes to the role of school principals in utilizing technology to increase equality, diversity, and digital awareness to carry out digital activities that are responsible to all school members. This dimension focuses on principal's role in ensuring the equality of IT competencies from teachers, equality of digital devices and student connectivity, also the assurance of data security policies and ethical digital behavior.

Figure 3. Technology leadership model in online learning

Dimension 2 focuses on the visionary planner which relates to the role of the principal in involving stakeholders to build a common vision for digital-based learning. This dimension discusses the role of school principals in equating the vision of digital learning, asking for support from all stakeholders, and establishing strategic partnerships with various parties to support success in digital learning.

Dimension 3 is about empowering leader which relates to the principal's role in motivating teachers and students to use technology in innovative ways to enrich the teaching and learning process. This dimension shows the role of the principal who must have empathy for all the problems of teachers and students and the principal encourages personalized professional learning. Distributed leadership is part of the principal's leadership, where leadership authority is divided between the teacher and the team under him. Teachers and students collaborate with each other to carry out digital learning experiments using various applications. Teachers also share knowledge with fellow teachers inside and outside the school.

Dimension 4 prioritizes the system designer related to the role of the school principal in building an IT team and a system for implementing the use of technology that can support the learning process. The principal builds an IT team to accelerate the digitization of learning. The school principal also prepares the necessary infrastructure (hardware and software) by utilizing government assistance, the community of parents, alumni and teachers.

Dimension 5 highlights the connected learners which relates to the principal's role as a role model and driver of continuous professional learning for himself and others. Principals are connected digitally with professional educators to update digital learning best practices from the latest. The principal also serves as a mentor for other schools and shares knowledge, experiences, and best practices with the professional network.

Dimension 6 articulates spiritual aspects related to the principals' role in motivating their team by combining vision, hope/faith, love, and kindness in the workplace, with the aim of increasing commitment and productivity. Spiritual principals can be seen from the categories, namely vision, altruistic, and faith. There are trust and loyalty in the leadership of the principal. The principal takes a humanist approach to the school community by being honest, friendly, patient, and always full of gratitude in carrying out your duties. The principal is persistent, does not give up easily, and is diligent in carrying out his duties, and believes that work must be sincere. The principal has noble aspirations to produce a generation that is not only technologically literate but also has noble character. In realizing an aligned vision, the principal encourages teachers to teach sincerely, students start learning with real intentions, and maintain the harmony and cohesiveness of all school members.

The school principal always oversees and assists in increasing the capacity of knowledge and competence of teachers related to digital-based learning and ensures that students can access and participate in digital-based learning. The principal maps students into several categories to overcome various problems in online learning. In the field, it was found that students could not participate in learning activities because only 1 mobile phone was owned by their families, so they had to take turns using it.

On the other hand, some teachers experience difficulties when the learning system changes from offline to online. This is especially experienced by senior teachers. To overcome this, the principal mapped teachers according to their IT skills. Then, the

principal formed an IT team consisting of young teachers and gave instructions to assist teachers who had difficulties in using IT.

To overcome issues related to the limitations of the equipment they have, the school organizes offline learning to facilitate students who cannot take part in digital learning. On the other hand, schools have also made efforts to provide support for the smooth running of the online learning process by operating government assistance. One way is to provide training related to applications that support online learning.

Proposition 1: The school principal's duty as a technology leader is to improve teachers' technological competency and assure students' readiness to participate in digital-based learning. The school principal mapped the level of teacher technological competence and mapped student readiness into three categories. The mapping of teachers includes high IT competence, medium IT competence, and low IT competence. Students were classified into 3 groups, namely full support parents (digital devices and internet access), half support parents (digital devices or internet access only), no parent support (without digital devices, without internet access). At the same time, the school principal is working with counseling teachers to educate students and parents on digital learning ethics.

To overcome various obstacles that arise during online learning activities in the COVID-19 pandemic era, schools have made various efforts. One of them is to map various categories according to the conditions in each school. Mapping was done at the teacher level and then given different treatments in each category (see Table 3)

According to Table 3, teachers who had higher IT competence were obliged to teach teachers with low IT competence (peer trainers). Peer trainers were also carried out by forming a team of IT coordinators. This is consistent with study published by Leithwood et al. (2020) believing that school principals are accountable for their actions and that distributed leadership is part of the school principal's leadership. The concept of dispersed or shared leadership has entered the leadership discourse in the crisis age, specifically leadership induced by the COVID-19 outbreak. Furthermore, the principal and teachers must ensure that everything works smoothly, particularly in the new normal age. This is consistent with Harris's (2020) statement that in the new normal era, principals and coordinating teachers should strive to ensure that schools continue to function effectively and efficiently, run normally, answer parent questions, and liaise with relevant agencies as a whole are responsible for school performance.

Table 3. Category mapping for teachers

No	Category	Description
1	*High IT competence*	Served as the school's IT coordinating team. Assigned as IT coordinating team for MGMP. If necessary, representing the school in IT development training organized by external parties.
2	*Medium IT competence*	Get mentoring from teachers who have high IT competence.
3	*Low IT competence*	Get more intense mentoring from teachers who have high IT competence. If needed, get mentoring directly from the school principal.

Source: Processed data, 2022

The principal's primary responsibility is to ensure that everyone in their organization has the necessary technological competence. The COVID-19 pandemic enabled the deployment of digital learning as an emergency alternative education system at all levels of schooling. From this perspective, more innovative and participatory "online learning" techniques will help educational institutions become more robust and prepared to deal with any crises and uncertainties in the future. During pandemic, principals and teachers at all levels must acquire the necessary digital skills to implement digital-based learning. Proper management of digital learning allows for the enhancement of the quality of education services supplied at the educational level. This is consistent with Karakose's (2021) statement that the first aim for school administrators is to close the knowledge and technology skill gaps among teachers that are required for digital-based learning activities in schools. Principals must guide and facilitate the proper use of technology in digital-based learning (Karakose, 2021).

At the same time, students also experienced obstacles in participating in the online learning process. According to Bogdandy et al. (2020), there are two reasons students cannot take part in online learning. First, it may be related to technical problems such as limited technological devices such as cell phones and internet access. Second, it is related to other problems in the family. Based on the findings in the field, to overcome these obstacles, all schools mapped student needs into several categories related to various student problems.

Based on Table 4, it can be concluded that school principals use different approaches to each category of different student problems. Principals must also create a flexible learning environment (Hadriana et al., 2021).

This is consistent with what Karakose (2021) revealed in responding to the global education crisis caused by the COVID-19 pandemic; school principals must care about the distance learning process as a teaching and learning strategy that must be constantly improved, and school principals must play a role in their schools' readiness to respond quickly to potential crises and uncertainties arising from the effects of a pandemic.

Furthermore, device issues and insufficient access at home are obstacles that prevent students from marginalized groups from participating in online learning. Mustapha and Kurt (2021) observed that perceptions of digital-based education and learning challenges that affect students' learning are significantly influenced by disparities between urban and rural contexts as well as family backgrounds. Socio-economic constraints within the family aggravate this disease (Mustapha & Kurt, 2021). According to Domina et al. (2021), the primary factor influencing students' participation in online learning is their access to technology, particularly the internet. The availability of devices and internet connection has a substantial impact on students' participation in online learning (Domina et al., 2021). However, their findings also showed that students who have access to a sufficient amount of internet and gadgets were more engaged in digital learning activities.

Table 4. Mapping category for students

No	Category	Explanation
1	Have the device and access to technology	-
2	Have a device but do not have access to technology	Utilizing assistance from the government and assistance from teachers regarding the provision of data packages.
3	Do not have devices and access to technology	Providing device assistance (mobile or tablet) by utilizing funds from the relevant government as well as assistance from alumni and parent committees.
4	Do not have devices and access to technology and have family problems	Conduct home visits and establish communication with families and students concerned.

Source: Processed data, 2022

Visionary Planner Dimension

The principal worked with all parties involved to realize the school's vision and ensure the success of the online learning process by involving education office, alumni, universities, and related institutions, as well as internal parties like teachers, non-teacher employees, students, and parents. Support from the government (Surabaya City Education Office) in the use of technology was demonstrated by providing training for all school principals and teachers. The training provided was on using Microsoft Office 365 applications and various other online learning applications such as Kahoot and Quizziz. In addition, the Surabaya City Education Office provided a domain for school websites to support branding in each school. The form of support from the government was not only in the form of training and providing school websites but also in the form of providing a budget for procuring and adding technology-based school facilities, such as providing a budget for building learning studios.

Schools assisted by the Surabaya City Education Office also assist children who are in the Low-Income Community (MBR, *Masyarakat Berpenghasilan Rendah*) category whose income is less than the Regional Minimum Wage (UMR, *Upah Minimum Regional*). This assistance was provided through the Smart Indonesia Program (PIP, *Program Indonesia Pintar*) with cash assistance in the amount of Rp. 750,000.00, which MBR students can use to buy cell phones for the smooth running of online learning in the new normal era. In addition, some schools used BOS (School Operational Assistance) funds to buy tablets and lend them to students who need them. Unfortunately, not all schools receive BOS funds. Only a few schools received performance BOS funds because they were among the top schools with good performance.

In the new normal era of education, parental and alumni collaboration and support are significant to the success of online learning as government funding. Parental support can take the form of giving learning support infrastructure and amenities, including air conditioning, TV, Wi-fi, and free data packages, to make teaching and learning activities in the classroom more comfortable, in addition to helping teachers condition each of their children.

Proposition 2: The school principal, as a visionary planner, leads the change process by involving internal stakeholders (teachers, non-teacher employees, students, and parents) and external stakeholders (education office, alumni, and related institutions) in building a common vision of using technology in schools. Support from the government, parents, and alumni is the main supporting factor for the success of digital learning in the new normal era.

Another important factor in the effectiveness of online learning is stakeholder involvement. According to Karakose (2021), school principals must foster innovation, establish a digital learning culture, promote

the development of a professional learning environment through the use of appropriate technology, and construct and lead a shared vision within their organizations. Therefore, school principals must establish and maintain strong relationships with all stakeholders, especially the government—in this case, the Surabaya City Education Office. As the primary force behind the success of digital-based learning in the new normal era, the government plays a crucial role in setting the direction, developing digital learning applications used by schools during the pandemic, and organizing training programs for teachers and principals.. During the new normal era, the form of government support for schools was in the form of Microsoft Office 365 training for all principals and teachers of private and state elementary and junior high schools, disbursing performance BOS funds used to purchase digital devices for teachers and students, and PIP program.

Apart from government support, support from parents and alumni is also crucial. Parents through the school committee are the second supporting factor for the success of online learning during the new normal period. The forms of parent and alumni committee support for the success of digital-based learning include: (1) procuring 360 cameras in each class for hybrid learning activities in schools; (2) provision of CCTV in each class to support school security; (3) free WIFI access for a year for each class; (4) Provision of air conditioning in each class to support learning comfort.

In addition, school principals must make sure that all parties involved can cooperate through shared commitment and cooperative effort in order to realize the anticipated benefits of online learning (Hadriana et al., 2021). Additionally, Harris (2020) asserted that in order to sustain academic excellence, schools—especially exceptional schools—will require additional support from guardians, parents, and community organizations in the future.

Empowering Leader Dimension

The rejection of technology at the beginning of the digital-based learning process occurred in all schools. This rejection comes from teachers who are senior or near retirement age. In terms of overcoming rejection, school principals have their strategies, with personal and professional approaches. The strategies undertaken include providing accompanying teachers with assistance in the operation of online learning support applications. Another strategy is to motivate and increase teachers' confidence in using technology.

Motivation to increase self-confidence is not only given to teachers but also to students. This was done to ensure that the online learning process in the new normal era can run well and that every student gets the right to take part in learning.

The principal supports a culture of innovation for teachers and students. Each teacher and student was allowed to explore their capabilities in terms of information technology that can support the online learning process. Some examples of school principals' support in terms of IT innovation are providing opportunities for teachers to build and organize their learning studios. Moreover, teachers are also given the freedom to explore online applications and effective online learning methods for students, and for students to explore their creativity through the use of various social media (Instagram, TikTok, Live Streaming).

Proposition 3: In leading digital-based learning, school principals must motivate teachers and students both personally and professionally. Principals must also support teachers and students in innovating and exploring digital learning.

During the transitional period at the start of the pandemic, teachers needed to develop new digital-based learning methods that were relevant to students and ensure that these learning methods reached all students. Technology-based learning to produce learning innovation is not possible if the teacher is unable or unwilling to support it. Therefore, according to Karakose (2021), school principals need to support teachers in exploring their skills in developing learning technology (such as Kahoot, Quizziz, and other learning applications). One way is to strengthen networking, both with internal schools, between schools, and professional teacher training institutions. School principals can participate in courses and seminars, sharing information among teachers and between schools, and encouraging the use of digital media for the learning process in the form of e-books and e-exams so as to achieve a digital learning environment and culture.

For students who are not present in digital-based learning, the principal assigns subject teachers to record absent students and report them to the homeroom teacher. Furthermore, the homeroom teacher, together with the guidance and counselling teacher, will conduct a home visit to explore more deeply the problems faced by these students. Student problems will be dealt with as soon as possible. However, if the problem persists, then the vice principal or principal will intervene (distribution of leadership and multilevel leadership). From the results of home visits conducted at the five schools studied, it was found that students who were not connected to remote learning mostly came from the MBR who were experiencing problems in their families, so it was not

simply that they did not have technological tools. Therefore, home visits are needed to establish two-way communication between teachers and students, which is vital in online learning, considering that the biggest challenge in online learning is the disparity between students who are well-facilitated and those who are not.

In addition, findings in the field show that school principals encourage teachers to take part in competitions held by the service. The following what was revealed by Hamzah et al. (2021) stating that principals need to promote professional development among teachers to increase instructor confidence in integrating digital teaching and learning. This suggests that principals need to correct deficiencies in their management and administration. They must provide opportunities for professional development so that teachers can learn the practical skills necessary to advance their professional practice.

System Designer Dimension

To support system designers in online learning activities, school principals form a special team whose job is to coordinate IT in schools. This team is in charge of managing the design of the IT system during teaching and learning activities. The principal forms an IT coordinating team.

Proposition 4: The principal acts as a system designer. The school principal forms an IT team to accelerate digitization in schools through a tiered scheme, namely (1) an IT coordinating team for the MGMP (*Musyawarah Guru Mata Pelajaran*/Teacher Working Group) and (2) an IT coordinating team that oversees several teachers. The school principal also develops digital technology infrastructure in schools to ensure the smooth running of digital learning activities.

Digital teaching, whether online or offline, can foster an active learning environment among students. Teachers can use digital devices to communicate and cooperate with students, other teachers, and parents. In addition to hardware and phone line issues, schools confront internet connection challenges that necessitate support from a variety of sources (Van et al., 2021). This remark is corroborated by the findings of Sung et al. (2016) discovering that digital gadgets can improve the integration of teaching and student learning effectiveness. Most students use laptops to write, surf the internet, create presentations, complete homework, and take examinations. Teachers will be able to make more adjustments to their teaching approaches as they have more possibilities to use laptops.

According to Emelyanova and Voronina (2014), the purpose of LMS in classroom settings is to enhance learning and increase student commitment, involvement, and learning outcomes. Based on field research, LMS is critical for schools to facilitate dynamic learning. According to Fung Kee Fung et al. (2000), an internet-based, multi-user, multi-center learning portfolio has a considerable positive influence on student and teacher perspectives. According to Pokhrel and Chhetri (2021), creating a good system that can meet the needs of a variety of students is extremely challenging. The COCID-19 pandemic has taught instructors and students the importance of using real-time online instructional tools.

Connected Learner Dimension

As human learners, the principal is always curious for knowledge and upgrades with digital-based learning technology and connects with fellow professional educators. Upgrading knowledge can be done by school principals by participating in various training webinars, as well as by sharing knowledge with various parties, both internal and external. The government (Surabaya City Education Office) has also facilitated training on online learning support applications for school principals and teachers.

Proposition 5: The role of the school principal as a technology leader is to strive to be digitally connected for his development so that he can keep up with the latest digital learning updates. At the same time, school principals also share knowledge with fellow principals from various cities and professional communities.

Digital school principals must be adaptable, versatile, and eager for intellectual curiosity and new knowledge (Karakose et al., 2021). According to Karakose (2021), the COVID-19 pandemic has resulted in relatively minimal face-to-face learning, and the school sector's transition to digital learning must be accelerated. At that time, education policymakers and administrators must create more functional programs that can be implemented swiftly. Thus. school principals must improve their knowledge and abilities in order to lead effective technological initiatives. Principals must take the initiative to conduct independent research on the use of technology and organize professional development for teachers in this area (Karakose, 2021).

As connected learners, school principals need to learn about digital learning best practices from professional educators, both at home and abroad, as well as carry out professional self-development (Chua & Chua, 2017). Therefore, school principals should have adequate knowledge and skills to navigate all forms of change in digital schools.

Spiritual Dimension

The COVID-19 pandemic has affected a large number of students and their families. This increases the opportunities for students to disconnect from digital-based distance learning. Meanwhile, one of the principal's obligations is to ensure that the learning process does not stop and all students can attend online learning. Therefore, the principal motivates teachers to work together to help students who need assistance with their digital learning.

In digital-based learning, school principals realize that the pandemic has caused limitations in face-to-face learning, a lack of emotional touch between teachers and students, and a lack of character education. The principal, as an online learning leader, should always motivates teachers to carry out their duties sincerely and selflessly and help each other. At the same time, programs implemented by school principals in leading schools related to spirituality can also be used to increase a sense of kinship cohesiveness and form a harmonious environment within the organization. A sense of mutual help also continues to be inflamed within the organization. A culture of smile and great must always be applied at school.

The principal also uses a spiritual foundation as motivation to help solve various problems that exist within his organization. Whether it is a problem between teachers, teachers and students, or between students. Even spirituality is also one of the school's visions. In realizing the school's vision, the principal collaborates with various stakeholders, both internal and external.

The grouping of research findings from spiritual elements possessed by each principal, deputy principal, IT coordinator, and school teacher in carrying out their duties at school was found during the in-depth interview process based on Fry's theory (2003). The results of these findings can be seen in Appendix 3.

Proposition 6: The principal takes a spiritual approach to all school members by always reminding them that work must be sincere. In addition, the school principal emphasized that digital learning is not only academic but also forms the character of students. In fact, digital-based learning in the new normal era has resulted in the teacher's touch in building children's character being very minimal so that the principal emphasizes teachers build character building for students.

This is consistent with Fry's (2016) research discovering that in spiritual leadership, a leader must always motivate and involve followers in actions that stem from a desire to serve others. The five principals of Surabaya's Superior State Junior High Schools agree that when running a school, principals must balance academics with the development of students' character. This is crucial and must be examined in order to produce students who are "IT literate" while still having noble character and values, allowing them to use technology properly in the online learning process. This character's development and strengthening is critical in the new normal era of online learning.

Effective leadership is more than just a set of competencies, it is also influenced by a leader's character, beliefs, morals, values, emotions, and spirit. To lead schools into entering the new millennium, which is unpredictable and full of uncertainty, principals need to strengthen the correlation between organizational success and spiritual development. According to Fry (2003), leaders with spirituality show true "care" in the organization. Their approach to problem-solving is synergistic, not adversarial. They seek to understand others first without wanting to manipulate them.

Principal spirituality encourages and facilitates positive change in the school community. In the new normal era, which is still shrouded in uncertainty, school principals have been leading with a spiritual approach since before the COVID-19 pandemic. For example, the school principal leads fundraising for students who are grieving or sick and aids victims of natural disasters. There is a culture of greeting before learning begins. However, during the COVID-19 pandemic, many students and their families were severely affected and required assistance, whether due to illness, the loss of loved ones, or financial hardship caused by job terminations (PHK, *Pemutusan Hubungan Kerja*). As a result, school principals adopted a stronger spiritual approach in the new normal era, providing guidance and support to their school communities.

Based on the aforementioned ideas presented, it is possible to conclude that the role of school principals in digital learning in the new normal period includes:

1. The school principal should always upgrade the technological competence of teachers and ensures students' readiness to take part in digital-based learning. Principals are the main decision-makers in digital learning in their schools.
2. Principals must develop and lead a shared vision inside their institutions in order to foster a digital learning culture, as well as establish and maintain strong relationships with stakeholders (particularly associated agencies, parent committees, and alumni), all of which contribute to the success of digital-based learning. The principal must guarantee that the primary drivers collaborate and work hand in hand.
3. Principals need to support and motivate teachers and students to explore skills and develop learning

technology (Kahoot, Quizizz, Sway, Google Classroom) to produce innovative learning methods. The principal must also support and strengthens the networking of school members with internal and external parties of the school.

4. School principals need to support dynamic, multi-user, multi-center learning, internet-based learning LMS, and invest in an effective and integrated digital learning system in real-time with the support of a competent IT team and an adequate infrastructure system in schools.
5. Principals must always be digitally connected for professional self-development so that they can understand the latest digital learning updates (by building digital communities, digital professional communities, and sharing knowledge between fellow principals and other parties). Also, principals must be flexible, adaptable, and thirsty for new knowledge.

The school principal prioritizes spiritual values in carrying out his duties & responsibilities. Spiritual values are instilled in all school members that work must be sincere, evoke feelings of gratitude, and have good values in every action, and that digital-based education not only develops children's academics but must also shape students' character and morals.

Conclusions and Implications

From the findings in the field and the results of in-depth interviews, the spiritual dimension emerged quite strongly from all informants (principals). In fact, the lessons learned by school principals in leading digital-based learning during the new normal era were (1) the school principal succeeded in making teachers more technologically literate, and (2) the school principal invited school members to believe that work must be sincere. This study produces the latest model that is suitable for school principals as technology leaders in the new normal era, the latest technology leadership model consists of 6 dimensions, namely Equity and Citizenship Advocate, Visionary Planner, Empowering Leaders, System Designer, Connected Learner, and Spiritual. This study discovered that the spiritual aspect became the basis of motivation for actions taken by school principals, which were reflected in actions in the other five dimensions investigated in this study, implying that it is this spiritual aspect that promotes the establishment of effective technology leadership in the new normal era.

From the discussion above, it can be concluded as follows:

1. A technology leader is not only a leader who understands technology but is also able to move his organization to adopt a technological culture and anticipate changes and obstacles that may occur in the future.
2. Technology leaders must be leaders who are people-oriented, make high connections and collaborate with many parties, are super flexible, have strong empathy, and can conduct personalized professional learning.
3. Technology leaders who lead with passion, and their responsibilities grow on the values of sincerity, earnestness, good intentions, honesty, and kindness. However, at the same time, the technology leader shows tenacity and belief and struggles to achieve goals.

Theoretically, the findings of this study are expected to have several implications, including: (1) Strengthening the development of existing leadership theories. Leadership theory has evolved alongside changes in organizational conditions and technological advancements. Initially rooted in the Great Man Theory, leadership thought progressed through Trait Theory, Behavioral Theories, Contingency/Situational Leadership, and Transformational Leadership. Today, these theories continue to develop, adapting to contemporary challenges and innovations in leadership practices. The rapid development of information technology and the emergence of COVID-19 have further strengthened the position of the Technology Leadership theory; (2) The results of this study strengthen and develop the existence of the previous Technology Leadership theory. This study has succeeded in finding that the spiritual aspect is the sixth dimension in technology leadership. The development of this technology leadership theory can be a reference for further research with similar topics.

In practice, the findings of this study provide several implications, including (1) Providing an overview of effective principal leadership in the new normal era; (2) Providing a reference for principal competency standards in leading learning in the new normal era; (3) Confirming that the key drivers for the success of digital learning in the new normal era are government and parent community support; and (4) Providing insight into the similarities in management practices in leading schools that implement digital-based learning in the new normal era.

This study has several limitations. First, the limitation concerns the principal informants, SMPN 1 and SMPN 6 Surabaya, who are still serving as Acting Task Force (Plt, *Pelaksana Tugas*) and have had short tenure at the school. Consequently, the material

gathered during the interview focused less on the role of the school principal in guiding the use of technology in the process of integrating digital learning in schools during the COVID-19 pandemic. Second, given the total number of state junior high schools in Surabaya and the amount of samples collected, the findings based on field observations supplemented by in-depth interviews with school principals, deputy principals, IT coordinators, and teachers, they stated that they also taught these IT skills to other schools, indicating suggest that the selected sample adequately represents the latest trends in technology leadership within Surabaya's state junior high schools.. Additionally, many of the participants indicated that they also shared their IT knowledge with other schools, further supporting the relevance of the sample in understanding digital learning integration.

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Appendix 1. Single Analysis Results

	Equity & Citizenship Advocate	*Visionary Planner*	*Empowering Leader*	*System Designer*	*Connected Learner*	*Spiritual*
SMPN 1	• Technology training for teachers. • Grouping students based on ownership of IT devices (lend tablets, distribution of internet quota from the government (PIP), and conducting home visits). • Together with the homeroom teacher and the Counseling Guidance teacher, the school principal conducts outreach to parents and students about the ethics of digital behavior. • The principal ensures data security.	• Educating parents. • High collaboration with government agencies. • The school took part in an IT competition held by government agencies. • Peer tutor between internal teachers. • Microsoft Office 365 is the material for the Student Orientation Period at school. • 17 classes received online learning camera assistance by the parent committee. • Collaboration with parents and Rotari Club (lending tablets and distributing 1,500 starter packs). • The principal and parents of students distribute various assistance.	• Sharing knowledge gained from training to other Principals and teachers at school. • Encourage teachers to take part in learning innovation competitions. • Enter digital classes. • The principal gathers young teachers to share knowledge accompanied by the subject coordinator. • The principal supports teachers to innovate in learning applications. • The Principal provides outreach, training, and motivation for teachers. • The principal encourages the teacher to appear on the TV9 show. • The Principal supports the training of OSIS members to operate cameras, record, edit and live stream.	• The Principal arranges an IT team consisting of 3-4 people. • The Principal creates modules and tutorials for using Microsoft Office 365 and Zoom. • Utilize Zoom to coordinate with parents. • Mapping 11 subject coordinators. • There is a username and password for each student. • The principal asks the teacher to record lessons in class. • The Principal supports the construction of a podcast studio for students. • Use the Quizziz and Sway apps connected within Microsoft Office 365. • Data security is centralized in the IT Team.	• The principal always updates knowledge. • The Principal as a digital user. • Joined the WhatsApp group of school principals with achievements throughout Indonesia. • Collaboration with Al-Azhar (Moodle) and other junior high schools.	• There is no emotional touch in online learning so that student discipline is reduced. • The principal feels guilty if he doesn't help his fellow human beings. • The principal of the school puts forward morals and morals. • Conduct home visits to find out the actual state of students. • The school's vision contains spiritual aspects and character education. • Escort grade 12 students who have problems during school exams so they don't drop out of school. • Teachers are directed to empathize with the condition of students. • Smile and great campaign. • Providing compensation/ social assistance to students who fall into the category of Low Income Communities (MBR).
SMPN 6	• Mapping teachers & students. • Actively sending	• The parent committee provides cell phone and Wi-fi assistance in all	• The Principal motivates teachers to use Microsoft Office 365 (certified).	• Form an IT team (teachers and TU) of 5 people. • Received	• Participated in training held by the Indonesian Teachers	• Providing compensation/ social assistance to students who

	Equity & Citizenship Advocate	*Visionary Planner*	*Empowering Leader*	*System Designer*	*Connected Learner*	*Spiritual*
	teachers for training. • Internal training. • Students with category level 3 can use the computer laboratory. • For level 3 students, several treatments will be carried out including (1) home visits, (2) lending cellphones, (3) providing modules for offline learning. • The Principal ensures equal access and student connections as well as facilitated by technology.	classes. • At the beginning of the pandemic (before there was an official directive), the Principal ensured the same 1 application (the EdMoodo application). • The Principal coordinates with parents to support children. • ABC learning motto (Teach with heart, Learn with heart, Create meaningful learning).	• Watch a movie together in the teacher's room. • For teachers in the low competence category, the following treatment was carried out: (1) reminded by the MGMP coordinator, (2) backed up by the school's IT team, (3) motivated. • The principal goes directly to help teachers who cannot use IT. • The principal motivates students and teachers to adhere to the principles and vision of the school. • The headmaster asked that teachers with the same subjects have to make different questions. • Supervisory School Principal by entering the digital class. • The principal motivates teachers to share knowledge with fellow teachers and with other schools. • The principal reminds the teachers to be committed to the ABC vision in integrating teaching and learning. • The Principal supports the school's IT coordinator to share knowledge with other schools in the sub-region. • The school supports the IT coordinator to conclude an MOU with the Santa	assistance of 50 complete computer sets from alumni. • The principal instructs to be paperless in teaching and learning activities.	Association (IGI) and the agency. • The Principal is a Microsoft office trainer. • Trained high school teachers from Papua and Raja Ampat and trained school principals throughout Indonesia.	fall into the category of Low Income Communities (MBR). • The school principal motivates teachers to set aside some of their money as social assistance. • Conduct home visits to find out the actual state of students. • In the morning there is a special hour for character strengthening. • The school's vision contains spiritual aspects and character education. • The head of the school and the teacher pay attention to the students. • Teachers have social funds to buy quotas. • The principal continues to employ teachers who have physical disabilities and wish to resign. • Teachers are directed to empathize with the condition of students. • Smile and great campaign

	Equity & Citizenship Advocate	*Visionary Planner*	*Empowering Leader*	*System Designer*	*Connected Learner*	*Spiritual*
			Agnes and Santa Clara schools. • The Principal guides the teachers directly through video calls. • The assessors use the Canva, Quizizz, Jigsaw applications (based on teacher organization recommendations). • The Principal supports teachers to conduct independent training from the IKIP and MGMP. • The Principal motivates teachers to experiment with digital technology.			
SMPN 19	• Participate in government training. • The school principal found that the child's problems were motivated by family problems. • Mapping teachers and students. • Provide computers for students who are offline. • For students who do not have cellphones, they will (1) lend gadgets, (2) help with data packages, (3) communicate via WA, (4) prepare paper modules (sent/picked up to school). • The school principal ensures that there is security for	• Involve parents in supporting learning needs and facilities. • Parents donated speakers, TV and AC for the school. • The school accepts intern students. • Collaborate with the education office. • Peer tutor between internal teachers. • The school's vision is reflected in every poster on the walls and stairs of the school. • Microsoft Office 365 is the material for the Student Orientation Period at school • Participate in IT competitions held by the government. • The Principal involves alumni and committees	• Directing teachers to ensure that every student participates in teaching and learning activities and visiting students. • Caring for underprivileged students. • The principal enters the class to greet students (empowering students). • The Principal supports teachers to become teachers on TV9 and JTV programs. • The Principal motivates at every teacher meeting. • The principal motivates senior teachers. • The Principal encourages teachers to innovate in digital learning. • The Principal motivated the IT coordinator to become a resource person for other schools. • The Principal	• Formed an IT team consisting of 6 young teachers. • The principal adds wifi points at school. • Conference Camera, CCTV, AC, LCD & projector in each class. • Password & username in each teacher & student account. • Support the development of learning studios. • There are Standard Operating Procedures for learning and using HP. • The principal increases the internet quota. • The principal establishes a Decision Letter for the IT team.	• Keep abreast of IT developments . • Collaborate with education professionals such as ITS, IGI, PGRI, and the Rumah Belajar platform to provide learning technology training. • Principals as pioneers of digital learning.	• Together with the teacher making donations for students affected by Covid-19. • Work must be sincere. • There is a meal with the teachers on Friday. • Teachers are directed to empathize with the condition of students. • Behind the difficulty there is ease. • The poster reads "clean, tidy, diligent, harmonious, friendly • Smile and great campaign • Poster on the school steps that says "social care, positive thinking, obedient, wise, critical thinking,

	Equity & Citizenship Advocate	*Visionary Planner*	*Empowering Leader*	*System Designer*	*Connected Learner*	*Spiritual*
	exam questions and that only the IT team knows the password • The Principal socializes and provides Microsoft Office 365 training to all school members. • The Principal ensures that the privacy of student data is guaranteed. • The principal and the teacher socialize digital ethics to students.	to provide donations to students. • The vision and school program are socialized at the beginning of the school year to teachers, parents and students.	supports the IT coordinator and teachers to collaborate with schools in the sub-region (Al-Azhar Middle School, Gloria, Raden Paku) on Microsoft Office 365. • The Principal supports various digital activities (MOS streaming, competitions, school exploring films, and others) made by students, teachers, and OSIS administrators. • The principal motivates teachers to share knowledge with fellow teachers.			tenacious" • Dare to be Honest Key to a Lucky Life • Conduct home visits to find out the actual state of students. • The school's vision contains spiritual aspects and character education. • Smile and great campaign • Providing compensation or assistance to students who fall into the category of Low Income Communities (MBR).
SMPN 22	• Provide guidance and coaching on Microsoft Office 365. • The principal of the school teacher competency mapping. • The school principal socializes MO 365 to all school members. • The principal knows the condition of students. • Category C students will be prepared for an offline module. • Children are not connected to online learning because of parental problems (parents are imprisoned, parents are	• Collaborating with universities to educate on the use of technology. • Collaboration with parents who work at Telkom to provide internet connection. • Accepting Unesa intern students. • Cooperation with several universities. • The school principal shared knowledge from the training that was attended. • Principal S involves parents to supervise children's online learning.	• All students and teachers are accompanied by the Principal until they can. • The Principal supports OSIS and student activities in the form of Instagram, Tiktok, live streaming, environmental sons and daughters, and entrepreneurship. • The principal encourages teachers to create learning innovations. • The principal supports teachers in sharing knowledge with other school teachers. • The Principal supports the IT coordinator to become a trainer for all elementary and junior high school teachers. • The principal motivates teachers	• Formed an IT team from Teachers and TU consisting of 7 young teachers. • The Principal coordinates the creation of learning accounts. • Internet connection supported by parents. • Each student is given a username and password.	• Become a speaker and provide training to the principals of other public and private elementary and junior high schools in Surabaya. • The Principal collaborates with UNICEF and UNESCO.	• There are social funds from teachers and students to help students who need help. • Smile and great campaign • The Principal maintains relationships and harmonization among school members and resolves problems promptly. • Poster reads "Sincerely without expecting anything in return" • Conduct home visits to find out the actual state of students. • The school's vision contains spiritual aspects and

	Equity & Citizenship Advocate	*Visionary Planner*	*Empowering Leader*	*System Designer*	*Connected Learner*	*Spiritual*
	laid off, parents live out of town, parents die). • The school principal and homeroom teacher bought cell phones and internet quota. • The school principal provides internal training before the teachers attend training with the Education Office. • The principal ensures that the network in all classes is properly prepared. • The principal guarantees the confidentiality of data.		to share knowledge among fellow teachers.			character education. • Teachers are directed to empathize with the condition of students. • Providing compensation/ assistance to students who are included in the category of Low Income Communities (MBR).
SMPN 28	• Create a multilevel system to map teachers and students. • Rejection power before the pandemic was 50%. • Teacher mapping based on age (ring A, B, C, D). • Mapping parental support into 3 categories (full support, half support, no support). • Mapping parents (able and able, able but clueless, unable but willing to accompany, minus knowledge	• Applying a multilevel mapping model to accelerate technology leadership innovation. • Principals collaborate with the government, Stikom, Ruang Guru, Primagama and IGI for application training and activities related to digital learning.	• Take advantage of off-campus networking. • Teachers and students explore digital through broadcasting programs. • Personal approach to senior teachers. • Program 1 teacher 1 IT assistant. • Motivate and encourage senior teachers. • The Principal supports the vice principal, IT coordinator, and teachers to share knowledge with SMPN 2, 3, 11 and 26. • The principal invites IT literate teachers to always update their abilities. • The Principal supports ideas	• Create a learning studio from boss funds. • The IT team consists of Administration and teachers. • The principal creates a system by dividing the number of teachers and the IT team. • The Principal instructs 1 IT team to accompany 3-4 teachers. • There is a password and username for each student and teacher. • Microsoft Office 365 tutorials produced by the IT team are	• The Principal works with internal and external parties to create inclusive education. • The Principal is part of the GPKHI Whatsapp group. • Take Google Classroom training.	• Preparing spirituality before teaching. • Conduct home visits to find out the actual state of students. • The school's vision contains spiritual aspects and character education. • Teachers are directed to empathize with the condition of students. • Smile and great campaign. • Strengthen the jargon of child-friendly schools (diverse learner).

Equity & Citizenship Advocate	*Visionary Planner*	*Empowering Leader*	*System Designer*	*Connected Learner*	*Spiritual*
minus facilities). • The Principal conducts a Zoom meeting with parents about the ethics of digital behavior. • For students who fall into the category of Low-Income Communities (MBR) the following treatment is carried out: (1) students are loaned tablets, (2) assistance to parents, (3) providing flexible study time. • Has 100 tablets that can be lent. • The Principal directs students to study together at the Rukun Warga hall for smooth student connectivity.		related to technology. • The Principal supports the production of learning videos by the IT coordinator. • The principal is open to every change and innovation in teaching and learning.	distributed to students and teachers.		• The principal feels the alignment of vision as an educator with the belief to contribute totally to the world of education (smart inclusive school) • Strengthen inner and family connections as well as communicatio n between students, teachers, employees and parents. • Make programs together such as bands, karaoke, sports, and walks outside of school. • Providing compensation/ assistance to students who are included in the category of Low Income Communities (MBR).

Source: Processed data, 2022

Appendix 2. Cross Analysis Results

	Equality	Difference				
		SMPN 1	SMPN 6	SMPN 19	SMPN 22	SMPN 28
Equity and Citizenship Advocate						
Equal distribution of teacher skills in online learning	• Received MO 365 training from the Surabaya City Education Office. • The principal conducts internal training for teachers.	The principal divides the IT team to explain to teachers according to subjects.	• The principal divides the IT team to explain to teachers according to subjects. • Watch IT training together in the teacher's room.	The principal directed the 7 members of the IT team to explain to all teachers.	The principal divides the IT team to explain to the teacher according to class level.	The principal groups teachers with a multilevel system → ring A, B, C, D.
Equitable distribution of devices and internet access for students,	• Mapping the problems of students who are constrained by limited device access and connectivity. • Home visit of students who do not participate in digital learning. • Offline learning (modules sent home / modules taken home / studied in the school laboratory) • The problems of children who do not take part in digital learning are motivated by family problems. • Data package assistance from the Ministry of Education and Culture and digital devices. • The principal conducts internal training for students.	• Receive tablet assistance from the education office for students belonging to Low Income Communities (MBR). • Student mapping → full support 70%, half support 20%, MBR 7%. • At the start of the pandemic, modules were sent to homes. Then, the module is taken at school (once a week). • Received a conference camera donation from the school committee for 17 classes.	• Received cell phone assistance and wifi provision in all classes from the committee. • Modules sent home. • There are 10% MBR students. • Received assistance of 50 tablets from alumni.	• Received assistance in procuring CCTV, AC, LCD and Projector from the committee. • MBR student assistance from teacher donations in the form of cellphones. • Modules are taken on Monday, returned on Thursday.	• The homeroom teacher bought cell phones for MBR students. • Internet quota assistance from teacher & student donations (mosque cans). • Get help with a 1 year internet subscription from the student's guardian. • Assignment taken to school.	• For MBR students: (1) students are loaned tablets (2) assistance to parents, (3) provide flexible study time. • Mapping parental support into 3 categories. • The school principal conducts parent mapping (capable and able, capable but clueless, unable but willing to accompany, minus knowledge minus facilities).
Development of digital behaviour that is correct, safe, ethical, and responsible	• Data confidentiality has been maintained and there have been no problems	There's no difference.	There's no difference.	There's no difference.	There's no difference.	There's no difference.

	Equality	Difference				
		SMPN 1	SMPN 6	SMPN 19	SMPN 22	SMPN 28
	related to scattered data confidentiality → related to system design (username & password). • Challenges faced by the school → lack of discipline in student behavior, not wearing polite clothes, attending class while eating, students writing 'dirty' comments, saying profanities, and the entry of students from other schools. • Outreach to parents and students about digital behavior ethics. • There is security for exam questions and only the IT team knows the password.					
Visionary Planner	• The school vision is communicated at the beginning of the school year to students and parents. • High collaboration with the education office. • Microsoft Office 365 becomes material in the student orientation period. • Conduct outreach & participate in IT competitions held by the service. • Involve internal parties as peer tutors. • Have a vision for the use of technology in learning. • Collaboration from various stakeholders such as committees, parents, alumni,	• Cooperation with parents. • The IT coordinator is in the top 10 in an IT competition held by the agency.	• Cooperation with parents and alumni. • The principal takes a personal approach to direct teachers to have the same vision in the application of learning technology through the ABC motto (Teach with heart, Learn wholeheartedly, Create useful learning). • The principal advises parents who are full of support to buy their children's laptops. • At the	• Cooperation with parents. • Accepting student interns.	• Collaboration with several universities (Ubaya, Untag, Uinsa, Unesa, and Adibuana). • Accepting student interns.	• Collaboration with professional teacher organizations (IGI, Stikom, Primagama, Ruang Guru, Unesa). • Engage Google, Moodle and Microsoft Office 365 Master Trainers.

	Equality	Difference				
		SMPN 1	SMPN 6	SMPN 19	SMPN 22	SMPN 28
	agencies and other external parties.		beginning of the pandemic (before there was an official directive), KS confirmed 1 application (EdMoodo).			
Empowering Leader	• Motivate teachers to share knowledge (peer tutors) internally and externally. • The principal provides more assistance to senior teachers who have low IT competence. • The principal builds a culture of innovation and collaboration to support teachers and students in utilizing technology to improve the quality of various learning (making podcasts, Youtube, Instagram, Tiktok, and others). Regeneration of osis members to operate cameras, record, edit, and live stream. • Assistance for students to be able to take part in digital-based learning. • Principals enter digital classes to conduct evaluations (empowering teachers) and to greet students (empowering students). • The IT coordinator becomes a resource person for other schools.	• Collaboration with Al-Azhar (Moodle) and State Junior High School 11 Surabaya. • Preparing the display for TV9. • All teachers are required to take part in the learning innovation competition. • Learning with Sway, Quizziz and Kahoot.	• Teachers in the same subject were asked to make their own questions. • The principal motivates teachers for Microsoft Office 365 (certified). • IKIP and MGMP independent training. • Knowledge sharing with other schools in the sub-region (Giki Junior High School, Muhammadiyah, Baiturrahman, and Dapena). • MOU with Santa Agnes and Santa Clara schools. • The principal guides directly via video call after the evening prayer. • Learning with Canva, Quizziz, Jigsaw.	• The teacher becomes a teacher on TV9 and JTV shows. • Sharing knowledge with schools in the sub-region (Al –Azhar Junior High School, Gloria, Raden Paku) about Microsoft Office 365. • The principal provides motivation at every teacher meeting	• Learning with Sway, Quizziz and Kahoot. • Students won the competition to make a video with the theme of the pandemic and the environment. • Tiered assistance. First 1 IT helps 1 teacher, then 1 IT helps 2 teachers, 1 IT helps 3 teachers to be independent.	• The principal won the award as the national model principal. • Program 1 senior teacher 1 IT assistant.
System Designer	• The school created an IT	• The principal	• The IT team has	• The IT team is	• The IT team has	• The IT team has

	Equality	Difference				
		SMPN 1	SMPN 6	SMPN 19	SMPN 22	SMPN 28
	coordinating team to help adapt the use of technology to online learning. • Provision of Microsoft Office 365 software through the Education Office and hardware (tablets) through performance School Operational Assistance (BOS) funds and data packages (from the Ministry), as well as donations from the parent committee (conference camera, cell phone, CCTV, LCD, projector) for learning digital based. • There is a password and username for each student and teacher. The password can be changed by each user.	makes modules and tutorials for using Microsoft Office 365 and Zoom. • The division of the IT team based on subjects. • Utilization of Zoom software to coordinate with parents. • The HP Hardware and Conferenc e Camera are available thanks to a donation from the parent committee. • The school principal arranges an IT team consisting of 12 people.	participated in learning technology training since before the pandemic. • The principal directs the IT team to assist in making Microsoft Office 365 tutorials. • There are 50 sets of computers donated by alumni. • Form an IT team (teachers and administratio n) consisting of 6 people.	more intense in accompan ying senior teachers. • Devices in each class coordinator are in the form of a conference camera, CCTV, air conditionin g, LCD, and projector. • Synergy between school principals and committee s in escorting assistance such as trash cans, health equipment during the COVID-19 pandemic. • The IT team consists of teachers and TU → 6 young teachers. • The prin-cipal adds wi-fi points at school.	participated in learning technology training since before the pandemic. • Division of the IT team based on grade levels 7, 8, 9. • Formed an IT team from Teachers and TU → 7 young teachers..	participated in learning technology training since before the pandemic. • The principal with the IT team and the deputy head of the curriculum made a recorded tutorial on accessing Microsoft Office 365 which was then distributed to students and teachers who lack IT skills. • The IT team consists of TU and teachers → 11 young teachers. 1 IT accompanies 4 teachers.
Connected Learner	• Principals are connected to digital professional communities to learn from each other and discuss current digital learning issues. • The principal as a pioneer of digital learning in junior high schools in Surabaya.	• The principal as a digital user. • Joined the whatsapp group of outstandin g school principals throughout Indonesia.	Training high school teachers from Papua, Raja Ampat, training principals across Indonesia.	Schools actively cooperate with external parties to provide learning technology training and increase the capacity of school education staff such as ITS, IGI, PGRI, and the	Collaborating with UNICEF and UNESCO.	• The principal has a program called the Smart Inclusive School. • Principals are proactive in building networks with professionals from universities, LPMPs and master trainers in learning technology applications from within cities to outside

	Equality	Difference				
		SMPN 1	**SMPN 6**	**SMPN 19**	**SMPN 22**	**SMPN 28**
				Rumah Belajar platform.		cities throughout Indonesia. • Take Google Classroom training.
Spiritual	• Lessons from the Covid-19 pandemic: (1) the principal feels a lack of character education and direct contact with students, (2) the principal invites them to work sincerely • Becoming a school principal is a calling for informants, so that all levels (principal, vice principal, IT coordinator, and teacher) feel obliged to make a maximum contribution to the advancement of education. • The principal intensively builds emotional and spiritual relation-ships between school members • The school's vision contains spiritual aspects and character education. • Using a humanist approach in communicating. • Schools provide compensation/soc ial assistance for MBR students. • Smile and great campaign • Conduct home visits to find out the real situation when students are at home and establish commu-nication with parents. • The teacher is directed to empa-thize with the student's condition.	• Feel guilty if you don't help others. • The school's vision is "No Day Without Achievem ent, No Achievem ent Without Hard Work and Prayer." • The school principal conducts home visits 3 times to the homes of grade 1 junior high school students to ensure that those concerned take the graduation exam. • Escort grade 3 junior high school students who have problems during school exams so they don't drop out of school.	• In the morning there is a special hour for character strengthening . • Teachers have social funds to buy quotas. • The school's vision is "Creating True Learners who are Religious, Independent, Skilled and Care for the Environment and Social" • The school principal motivates teachers to set aside some of their money as social assistance. • Principals continue to employ teachers who have physical disabilities and wish to resign.	• Together with the teacher making donations for students affected by Covid-19. • Feel guilty if you let your child be disconnect ed from online learning. • Good intentions in teaching. • The principal of the school prepares gifts for the teachers. • There is a joint meal on Friday to increase cohesiveness • There is a belief that "Behind the difficulty there is ease". • The school's vision is "The realization of students who are superior, have character and have a global outlook."	• There are social funds from teachers and students to help students who need help. • Family at school increased after the pandemic. • The school's vision is "Excellent in achievement, intelligent, virtuous, with a global outlook and environmenta lly cultured based on faith and piety." • The principal maintains relationships and harmonizatio n among school members and resolves problems immediately. • Posters in the school environment that read "Be sincere without expecting anything in return"	• Preparing spirituality before teaching. • The school's vision is "To form people who are devoted to God Almighty, excel in achievements with character, are environmentall y cultured and have traditional arts, are child-friendly, anti-drug and have science and technology insight." • Strengthen the jargon of child-friendly schools (diverse learner). • The principal feels the alignment of vision as an educator with the belief to contribute totally to the world of education (smart inclusive school) • Strengthen inner and family connections as well as communicatio n between students, teachers, employees and parents. • Make programs together such as bands, karaoke, sports, and walks outside of school.

Source: Processed data, 2022

Appendix 3. Grouping Findings on the Spiritual Dimension

Argument	Vision	Altruistic Love	Faith
PRINCIPAL			
Principal 1			
Want direct contact with students.		√	
The existence of digital-based learning provides extraordinary wisdom.			√
Direct approach to students for problem solving solutions.		√	
Principal 2			
Initiated fundraising for those affected by the pandemic in the form of 10 kg of rice and 1 box of noodles.		√	
Principal 3			
Routinely raises funds to help orphans every month (Rp 30,000).		√	
Food gathering every Friday		√	√
Principal 4			
Always encourage to knit harmony between school members	√		√
Encouraging inclusive schools so that all school members always grow according to their capacity.	√		
Principal 5			
Encourage all teachers to teach with sincerity that what is done will benefit forever even after death.	√	√	√
Teach teachers to always manage their psychology and spirituality before teaching so that they are more enthusiastic when teaching.	√	√	√
SCHOOL VICE PRINCIPAL			
Vice Principal 1			
The school always prioritizes aspects of character and morality in every school program.	√		√
Vice Principal 2			
Being a teacher is a calling, so it invites you to be full of happiness.	√		√
The school routinely accompanies students with academic problems.		√	
Always adhere to the principles of the school's vision ABC (Teach with heart Learn with whole heart Create useful learning)	√	√	
Vice Principal 3			
School is like a big family, so when there are problems they always help each other.	√	√	
Vice Principal 4			
The lessons from the pandemic have made us more IT literate, that we will really need it in the future.	√		
Prioritizing aspects of morality and tolerance so that all religions are treated equally and the notion that school is a safe place for everyone.	√	√	√
Using a humanist and emotional approach in communicating because the teachers are very diverse.	√	√	√
Vice Principal 5			
Applying spiritual spirit at school with habits. In the morning it is customary to pray Dhuha and prayer, which are non-Muslim according to their religion, then there is child-friendly jargon so that it sticks with students and strengthens student employees and teachers.	√	√	√
SCHOOL IT COORDINATOR			
IT Coordinator 1			
The pandemic has taught us that teachers are now much more independent when it comes to IT than before.			√
IT Coordinator 2			
With the pandemic, teachers are motivated to upgrade their capacities in the field of teaching technology.	√		
Responsibilities as an IT choir can provide great benefits in the new normal era.		√	√
Through monitoring with Microsoft Office 365, the IT coordinator tracks students with problems and invites teachers to visit the homes of the students concerned.		√	
IT Coordinator 3			
Always prioritize aspects of courtesy and character such as smiles, greetings, greetings when meeting other school members.	√		
IT Coordinator 5			
Schools always encourage two-way and inclusive communication so that they can easily solve problems, especially in the pandemic era which makes direct communication more difficult.		√	

Argument	Vision	Altruistic Love	Faith
TEACHER			
Teacher 1			
The teachers learned that behind the pandemic there is a lesson to be learned that we must be willing to continue learning.			√
Dedication and loyalty to the school are always nurtured and echoed in the school's vision.	√		
Teacher 2			
Grateful and able to draw lessons from the pandemic so that we can understand more about the world of technology for teaching and learning	√		√
Becoming a teacher provides an extraordinary lesson and feeling when students become more successful than their teacher.	√	√	
The principal always provides motivation regarding ABC's vision (Teach with heart, Learn wholeheartedly, Create useful learning) at every moment.	√	√	
Schools sometimes make visits to students' homes to review student problems.	√	√	
Teacher 3			
Character education through inculcating the values of manners, manners, interests, talents, and the potential of students.	√		
Schools consider character education to have the same value portion of cognitive education (adiwiyata).	√		
Teacher 4			
Becoming a teacher has been a dream since the beginning to advance the world of education so that it can continue to be better.	√		
Prioritizing self-introspection so that the way of teaching can be understood by students.	√	√	
Becoming a teacher is a value of dedication so that you are not inferior to other countries.	√	√	
Teacher 5			
Intensively conducting character building and supervision of students.	√	√	

Source: Processed data, 2022

Appendix 4. Implementation of Technology in 63 Public SMP Negeri in Surabaya

	Schools with high technology implementation				
School Name (High Application Usage)	SMPN 1	SMPN 9	SMPN 19	SMPN 29	
	SMPN 2	SMPN 11	SMPN 21	SMPN 30	
	SMPN 3	SMPN 12	SMPN 22	SMPN 33	
	SMPN 4	SMPN 13	SMPN 23	SMPN 35	
	SMPN 5	SMPN 15	SMPN 26	SMPN 39	
	SMPN 6	SMPN 17	SMPN 28	SMPN 42	
				SMPN 46	
Technology applications that have beenadopted > 20 application networks	Online daily test	Try out online	CCTV		
	e-student pilot	Alumni database	*e-attendence (on going)*		
	Teleconference	Virtual Learning	integrasi *e-money (on going)*		
	Teachers utilize IT	e-library	PPDB online		
	Cross-regional IT cooperation	e-canteen	System information management		
	Students actively write on the website school	Raport online	online fund startup		
	Adiwiyata online	Learning Videos	School Web		
	Active students vlog	*e-financial report*			
	Schools with ongoing technology implementation				
School Name (Moderate Application Usage)	SMPN 7	SMPN 18	SMPN 31	SMPN 38	SMPN 47
	SMPN 8	SMPN 20	SMPN 32	SMPN 40	SMPN 48
	SMPN 10	SMPN 24	SMPN 34	SMPN 41	SMPN 49
	SMPN 14	SMPN 25	SMPN 36	SMPN 43	SMPN 50
	SMPN 16	SMPN 27	SMPN 37	SMPN 45	SMPN 51
Adopted technology applications 10-12 application networks	1. Guru memanfaatkan IT	6. Sarana komuiksi dan mengakses informasi online			
	2. Adiwiyata online	7. E-library			
	3. Try out online	8. Metode pengajaran online			
	4. Database alumni	9. PPDB online			
	5. Laporan keuangan online	10. School web			
		11. Raport online			
	Schools with low technology implementation				
School Name (Low Application Usage)	SMPN 54	SMPN 59			
	SMPN 55	SMPN 60			
	SMPN 56	SMPN 61			
	SMPN 57	SMPN 62			
	SMPN 58	SMPN 63			
Adopted technology applications < 10 application networks	1. Raport online				
	2. Tryout online				
	3. School web				
	4. PPDB online				

Sources: Dinas Pendidikan Kota Surabaya, 2019