

# Preparedness and Promotion of Technology Leadership Toward Self-Efficacy and Instructional Performance

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## Abstract

This study focused on the preparedness and promotion of technology leadership towards self-efficacy and instructional performance of public elementary school teachers. This utilized 442 public elementary school teachers from Candelaria, Quezon through a descriptive correlational design conducted during academic year 2021- 2022. A researcher- made survey questionnaire was utilized via Google form. The study revealed that self- efficacy was significantly predicted by systematic development when it comes to preparedness of technology leadership while promotion of technology leadership, self- efficacy was significantly predicted by technology infrastructure and support and vision, planning and management. Meanwhile, instructional performance was significantly predicted by systematic development and visionary leadership when it comes to preparedness of technology leadership while promotion of technology leadership, it was significantly predicted by vision, planning and management, technology and infrastructure support, and evaluation and research. This implies that working with peers and doing reflection may also help in enhancing self-evaluation towards teaching performance so teachers can assess points they are good at and they need to develop further.

**Keywords:** *promotion of technology leadership, preparedness of technology leadership, self- efficacy, instructional performance*

## Article History:

*Received:* July 28, 2022

*Accepted:* August 31, 2022

*Revised:* August 30, 2022

*Published online:* September 5, 2022

## Suggested Citation:

Macatangay, J.D. & Callo, E.C. (2022). Preparedness and Promotion of Technology Leadership Toward Self-Efficacy and Instructional Performance. *International Journal of Educational Management and Development Studies*, Volume 3 Issue 3, pp. 185 - 208. DOI: <https://doi.org/10.53378/352920>

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## 1. Introduction

Today's world is changing at such a rapid pace that the majority are the results of technological advancements. The application of technology in various fields, such as education, is becoming more widespread as technology advances. The goal of education is to prepare students with 21st-century skills, which includes the enculturation of various forms of information and communication technology applications. School administrators and teachers are confronted with a significant challenge in adapting to this constantly changing mode of learning. Various activities are conducted on a regular basis at school to improve the skills of teachers, and these activities are carefully planned and managed by the school principal (Ataman, 2002 as cited by Celep, 2014). Most of these activities are related to professional development, particularly on incorporating technology into classroom instruction at the height of the technological era.

In this context, school administrators play an important role in the instruction cycle (McLeod et al., 2015) such as preparing the teachers and the school in facing dynamic change. It has been a critical role for school leaders in terms of readiness and preparation in promoting and implementing technology leadership to continue and give effect on self-efficacy and instructional performance of the teachers. The common question among academic soldiers is considered to be crucial especially this time of the pandemic and even during the post pandemic time when learning delivery landscape is changing.

The goal of the study is to determine how preparedness and promotion of technology leadership of school leaders affect the perception of teachers towards self- efficacy and instructional performance.

## 2. Literature Review

### *2.1. Preparedness of Technology Leadership*

Engaging teachers towards the use of various technology tools and orienting them on different concepts of technology requires school leaders to be equipped with the necessary ideas on technology leadership. Their role in visionary leadership, modeling best practices, and support for instructional technology is key to successful technology integration (Gosmire & Grady, 2007). To fulfill these roles, it is clear that technology leadership skills are needed and awareness of those skills is critical.

***Visionary Leadership.*** Is one of the leadership philosophies used by school administrators to carry out their duties. Visionary leaders inspire others, guide and steer their subordinates toward organizational objectives, and have the ability to see into the future. They have the potential to influence their friends, are creative individuals who work in schools, and have realistic suggestions on how to affect change. They set an example for other members and represent the organization's rights and responsibilities. Strong visions are held by visionary leaders both inside and outside the company (Yulindasari, 2020).

***Digital Age Learning Culture.*** Educators can employ various digital tools and software applications/programs to create digital environments that enhance student learning and teaching programs. Students' potential to develop practical competence in digital contexts is determined by the embeddedness of the experience (Alim & Paris, 2015). Digital technology can aid educators in creating or customizing activities that cater to and support students from diverse cultural backgrounds. Teachers must learn about their students and their cultures and how to use digital technology to differentiate activities and help their students. By utilizing technology to tailor learning, teachers may focus on their student's particular needs and cultural variety. To better reflect students' identities, cultures, experiences, and knowledge, classrooms, online spaces, and digital resources must be accessible to their communities (Richardson et al., 2013).

***Excellence in Professional Practice.*** Administrators cultivate a culture of professional growth and innovation that enable educators to leverage cutting-edge technologies and digital resources to enhance student learning: allocate time, resources, and access to ensure that your technology fluency and integration continue to improve; facilitate and participate in learning communities that encourage, cultivate, and support administrators, faculty, and staff in technological studies and applications; the utilization of digital tools promotes and exemplifies effective communication and collaboration among stakeholders; and remain abreast of educational research and emerging trends in effective technology use, and encourage the assessment of new technologies' capacity to enhance student learning (ISTE, 2014).

***Systematic Development.*** Data-driven decision-making is the focus of systemic improvement. This subscale assists leaders in attracting and retaining tech-savvy instructors and employees. Leaders should also invest in technological infrastructure and collaborate with businesses to manage and support technology (Sykora, 2009 as cited by Molina, 2018). Administrators give digital age leadership and management to help the company improve its

performance by maximizing information and technology. Strategies such as led deliberate change to enhance educational objectives using technology and media-rich materials, collaborate to design metrics, collect and analyze data, assess findings, and share findings to enhance staff performance and student learning, hire and keep highly skilled personnel who can creatively and effectively use technology to accomplish academic and operational goals, form and use strategic alliances to aid systemic improvement and create and maintain a robust technical infrastructure with integrated, interoperable technology solutions to support management, operations, teaching, and learning.

**Digital Citizenship.** The digital citizenship standard outlines how a school technology leader might use contemporary digital communication to assist pupils in understanding and engaging with global issues. This standard focuses on school administrators' duties in advocating for, modeling, and putting "policies for safe, legal, and ethical use of digital information and technology" (ISTE, 2014). Digital citizenship promotes and demonstrates moral and social engagement when using digital technologies. Following the digital citizenship subscale, leaders must guarantee equal access to technology resources. Leaders are supposed to promote ethical, legal, and safe technology use by setting an example for others to follow. Responsible technology use and social interactions are also expected in a digital context.

## ***2.2. Promotion of Technology Leadership***

School leaders are expected to spearhead all the school improvement changes including those that are technological in nature. Therefore, they promote and execute this duty in their capacities as technological leaders. It involves various concepts such as vision, planning, management, staff development, infrastructure support, research and evaluation, and communication skills. According to Januszewski and Molenda (2008) cited in Brown (2009), technological leadership is defined as the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.

**Vision, planning and management.** Vision-driven strategies and policies for managing educational transformation would assist management teams in understanding the concept and goal of the change. The primary difficulty for educational planners and decision makers in today's competitive and changing period is developing a properly developed strategic plan that includes vision-driven strategies and policies that can effectively deal with the transition process using best

management practices (Brayson et al, 2011). As a result, change management teams must formulate a clear vision and analyze the mission and goals of the transformation.

***Staff Development and Training.*** The development and training of people are essential for technology leadership. According to IT executives, the most important job is being able to articulate and locate resources for employee development (Dexter, 2018). Practical staff training must include the description and identification of resources and the adaptation of development programs to meet the needs of the individual and the school. For instance, listings and schedules for technology workshops and courses should be accessible to all administrators, educators, and support staff. As part of the design and execution of educational staff development activities, curricular guidelines and competent technological leadership are also necessary (ISTE, 2014). To successfully execute an instructional technology plan at every grade level and across all subjects, principals must recognize essential resources and participants who can offer formal and informal leadership and technical help. The second aspect, staff training, and development, recommend administrators to support teacher technology use by providing support and training. The training and development of staff in technology is the responsibility of principals. To demonstrate effective technology leadership, principals should support teachers in learning technology skills, design and coordinate existing and future technology staff development programs, and give teachers adequate technology training. Staff training and development played a significant part in this example in explaining principal technology leadership.

***Technology and Infrastructure Support.*** Technological acquisition and infrastructure support are critical aspects of technology leadership. Leaders in technology must provide service and technical support to their institutions. As technology leaders, principals must ensure that students have access to and the ability to obtain technological resources, as well as that proper technology facilities are well supported. Technology leaders should be able to assist staff with a variety of issues, including purchasing appropriate software applications, troubleshooting equipment problems, installing equipment and infrastructure, maintaining and repairing equipment, understanding a variety of operating systems, and managing and allocating resources fairly and effectively (Ford, 2000 as cited by Hsieh and Hsiao, 2013). The most frequently highlighted key parts of principals' technology-related activities were providing and ensuring access to technology and sustaining infrastructure support (Inkster, 1998 as cited by Celep, 2014). Principals' technology leadership includes acquiring technology and supporting school

infrastructure. As technology leaders, principals must ensure that adequate technology facilities are available, that access to technology resources is available, and that school workers are supported when technical assistance is required. Principals must ensure that their schools' equipment is repaired and maintained on a timely basis.

***Evaluation and Research.*** Effective principals use evaluation systems that allow teachers and staff to be assessed against logical standards and drive their professional development objectives (ISTE, 2014). In evaluating instructional staff success in the usage and application of educational technology, principals should consider the learning and teaching process as a factor (ISTE, 2014). According to Cory (1990) as cited by Celep et al. (2014), because instructional and learning programs are continually evolving, they must be evaluated annually and the results must be incorporated into continuing and future planning and assessment procedures. Evaluations of new and existing technology in evaluating benefits, and educational impact should be part of effective technology leadership (Celep et al., 2014). Such evaluations provide administrators with the necessary data to successfully analyze and improve their schools' technology strategies.

***Interpersonal and Communication Skill.*** The workplace encourages co-workers and fellow employees to communicate and retrieve information quickly and efficiently, coordinate and perform job obligations, make choices, and reduce or resolve issues. Communication can take many forms in organizational life, including conflict, cooperation, decision-making, power and authority, compliance gaining, resistance, morale and cohesion, and building and maintaining relationships. Littlejohn and Foss (2010) as quoted in Weng and Tang (2014) claim that an organization consists of two or more individuals who depend on one another for input, through input, and output. Beebe and Masterson (2011) assert that acting on information constitutes the process of communication. Messages are sent and received concurrently during this process, which enables us to understand the world and communicate that understanding to others. Face-to-face communication typically offers the best opportunity to make sense of uncertainty and clarify meaning.

### ***2.3. Self- Efficacy***

Self-efficacy refers to an individual's belief in his or her ability to carry out the behaviors required to achieve specific performance goals (Bandura, 1977, 1986, 1997). Self-efficacy is

confidence in one's ability to exert control over one's own motivation, behavior, and social environment.

**Work self- efficacy.** Employees' perceptions of work connections and job happiness improve with high self-efficacy. This state suggests that the person can operate in a way that will lead to long-term benefits and engage with others in their workplace (Mangkunegara et al., 2013). Individuals with high self-efficacy may develop considerable self-confidence in their ability to complete a task (Peng et al., 2013). Furthermore, they can overcome challenges in their work. Similarly, the higher one's self-efficacy, the more capable one is of accomplishing the task. Employees' work self-efficacy must be developed by considering their attitude toward work and work environment. Employees' work self-efficacy can be boosted by enhancing their attitude toward work, and the work environment can also aid in the development of work self-efficacy.

**Instructional Self- efficacy.** According to Dibapile (2012), teachers with high self-efficacy employ effective teaching tactics, provide excellent classroom management, and thereby minimize the proportion of students with poor levels of success. As a result, school managers should strive to promote teacher self-efficacy as a tool to improve teaching effectiveness. Another advantage of school administrators improving teacher self-efficacy is that it helps teachers avoid burnout. At this moment, the school administrators' leadership actions become very crucial. Even though certain research suggests that school administrators' instructional leadership actions impact teacher self-efficacy (Bellibas & Liu, 2017).

**Technology integration self- efficacy.** The self-efficacy idea was described by Bandura (1982) as a personal estimate of what an individual can perform when faced with certain tasks. Moreover, self-efficacy is the idea that a person can organize and use necessary talents to attain desired objectives (Abun et al., 2021). By establishing their self-efficacy beliefs, it is possible to predict what information and skills individuals possess and what they can accomplish in class. Digital technologies are regarded as common assets in schools when incorporating relevant information and communication opportunities (Koc & Bakir, 2012).

#### **2.4. Instructional Performance**

Effective teachers teach the curriculum at a depth that allows students to apply, synthesize, and analyze their learning. At present, the incorporation of various digital learning concepts and materials further help teachers in executing instructional performance.

**Digital Pedagogy.** According to Kivunja (2013), digital pedagogy is the ability to integrate digital technology into teaching in such a way that they improve learning, teaching, evaluation, and curriculum. It can also be defined as the use of digital tools in the classroom. There are three components to this concept of digital pedagogy: 1) pedagogical perspective, 2) pedagogical practices, and 3) digital pedagogical competences.

**Digital learning resources.** Digital learning resources provide new skills as well as educational chances. Students can prepare for the lesson and self-study using additional materials. Students are changed by the instructional process that uses digital educational tools. The process outcomes can be seen in students' academic and personal success. According to Bocconi et al. (2013), students' usage of digital learning resources during lessons is linked to teachers' confidence in their digital abilities. The use of technology in the classroom was emphasized as an important aspect of digital pedagogy. Digital pedagogy is the purposeful integration of digital technologies into instructional methods (Sailin & Mahmor, 2018). The successful and efficient use of ICT infrastructure and digital learning resources requires continuous professional development and continuing training.

### **3. Methodology**

#### ***3.1. Research Design***

This study used descriptive and correlational research design to measure the preparedness and promotion of technology leadership of school leaders towards self- efficacy and instructional performance of public elementary school teachers. It is descriptive since it involves gathering, analyzing, classifying, and tabulating data about current conditions, practices, trends, and cause-and-effect relationships in order to obtain adequate and accurate interpretation of such data. Since there are existing variables to obtain data, correlational research design is also used.

#### ***3.2. Respondents of the Study***

The participants of the study were 442 teachers from the districts of Candelaria, Quezon in the Philippines selected through random sampling technique. There were 285 from the 15 schools of Candelaria East and 157 from the 11 schools Candelaria West.



The bulk of respondents (137 teachers) were within the age range of 31 to 40 years old. In addition, majority of the respondents were female, married, with master's degree units and 1 to 10 years of teaching service. Meanwhile, most of the teachers have Wi-Fi as their Internet connection method in their school with the presence of e-classrooms/laboratories and receive DCP at their respective institutions.

### ***3.2. Research Instrument***

The study used a researcher-made questionnaire to elicit data from the respondents. The instrument was divided into five parts. The first part describes the profile of the respondents which includes the age, gender, civil status, educational qualification, years in service, academic position, type of school, availability of connectivity, gadgets available in school, and presence of laboratory/e- classrooms. The second part covers the preparedness of technology leadership. It discussed the respondents' perceptions of their school leader's technology leadership with regards to visionary leadership, digital age learning culture, perfectionism in professional practice, systematic development, and digital citizenship. The third part encloses the promotion of technology leadership which discussed the respondents' perceptions on their school leader's promotion of technology leadership. These dimensions include vision, planning and management, staff development and training, technology and infrastructure support, evaluation and research, interpersonal and communication skills, and interpersonal and communication skills. The fourth part covers self- efficacy that gave emphasis on instructional self-efficacy, work self-efficacy, and technology integration of teacher respondents. Lastly, the fifth part discusses instructional performance which describes the teacher respondents' perception on digital pedagogy and digital learning resources. The questionnaire was validated by selected experts and tested for consistency through pilot testing.

### ***3.3. Data Gathering Procedure***

The Google form was created to conduct the survey due to the strict health protocols implemented during the data gathering period. The link was disseminated to twenty- six schools of Candelaria East and West Districts. The study ensured the confidentiality of the gathered data from the respondents.

### ***3.4. Statistical Treatment***

In measuring the preparedness and promotion of school leader with regards to technology leadership, mean and standard deviation were used. To examine the result of self- efficacy and

instructional performance, mean and standard deviation were also used. Furthermore, to test the significant relationship between preparedness of technology leadership and promotion of technology leadership to self- efficacy and preparedness of technology leadership and promotion of technology leadership to instructional performance, multiple linear regression was used.

## 4. Findings and Discussion

**Table 1**

*Preparedness of Technology Leadership*

Indicators	Mean	SD	Interpretation
Visionary Leadership	3.51	0.54	Highly prepared
Digital Age Learning Culture	3.48	0.52	Prepared
Excellence In Professional Practice	3.49	0.55	Prepared
Systematic Development	3.45	0.51	Prepared
Digital Citizenship	3.39	0.56	Prepared
<b>Overall</b>	<b>3.46</b>	<b>0.54</b>	Prepared

*Legend: 3.50-4.00 Strongly agree/ Highly Prepared, 2.50-3.49 Agree/Prepared, 1.50-2.49 Disagree/ Somewhat Prepared, 1.00-1.49 Strongly Disagree/Not Prepared*

Table 1 shows the summary of the teachers' perception on preparedness of technology leadership. It can be gleaned from the table the overall mean of 3.46, which is interpreted as 'prepared.' This implies that teacher respondents agreed with the variables that their school leaders execute when it comes to preparedness of technology leadership. Hence, majority of the school leaders are prepared. Moreover, teachers believed that visionary leadership is 'highly prepared' which gained the highest mean of 3.51. This implies that teachers believe in the perception of their school leader when it comes to innovation, betterment of the school, and promotion of achieving a common goal. It is important for a school leader to have a vision for the school so that there will be a blueprint that the members of the faculty and even stakeholders can envision. By providing such, there will be a path that they can follow and be somewhat motivated to do their best to achieve it. On the other hand, teachers give digital citizenship the lowest rating of 3.39 weighted mean. It implies that as digital citizens, school leaders tend to give less focus on this indicator although it cannot be excluded that they also exert effort in order to ensure access to appropriate

digital tools and resources to meet the needs of their colleagues and students. Moreover, they encourage, demonstrate safe, legal and ethical use of digital information and technology by ensuring that the data privacy law is always adhered and considered.

These results are congruent with Mwawasi (2014) that school leaders have placed a high value on technological leadership. School leaders strengthened school capacity for ICT use in teaching and learning by establishing initiatives aimed at increasing ICT uptake for pedagogy improvement. Professional development for school leaders is therefore critical to help them gain knowledge of the most up-to-date information on ICT and technology use, as rapid technological innovation provides a constant challenge of new knowledge and skills, which the leaders require. Furthermore, school leaders must work hard to enlist the support of all instructors in order to enhance the entire school.

**Table 2**

*Promotion of Technology Leadership*

<b>Indicators</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
Vision, Planning and Management	3.44	0.56	Promoted
Staff Development and Training	3.53	0.52	Highly promoted
Technology And Infrastructure Support	3.43	0.54	Promoted
Evaluation And Research	3.42	0.55	Promoted
Interpersonal And Communication Skills	3.46	0.54	Promoted
<b>Overall</b>	<b>3.46</b>	<b>0.54</b>	<b>Promoted</b>

*Legend: 3.50-4.00 Strongly agree/Highly Promoted, 2.50-3.49 Agree/ Promoted, 1.50-2.49 Disagree/Partly Promoted, 1.00-1.49 Strongly Disagree/ Not Promoted*

As gleaned in table 2, the summary of promotion of technology leadership got an overall mean of 3.46, which implies that the promotion of technology leadership is promoted by their school leader giving great emphasis to staff development and training since it gained the highest mean (3.53) among the indicators. In this regard, it implies that school leaders turn their focus on the needs of teachers with regards to professional development especially when it comes to technology skill enhancement. Moreover, the pandemic that has brought great effect in the cycle and delivery of learning has also opened doors for teachers' professional development that mainly focused on technology. Teachers were encouraged to involve themselves in various training online

that have become mostly free. In this regard, the role of school leaders was to encourage teachers to join or enroll in such training to enhance their technology skill and use it in learning delivery. Moreover, it is to find fulfillment in improving oneself to find satisfaction. Khan et al. (2016) mentioned that employees perform well when they reach a level of satisfaction that they are happy with. Through training, it increases the efficiency of the group, making them the determinant for the success or failure of the organization (Mwema & Gachunga, 2014).

Meanwhile, evaluation and research gained the lowest mean of 3.42. This implies that school leaders turn less in the utilization of data that can be derived from conducting evaluation, research and benchmarking. Moreover, conducting such activities although required and present consumes a lot of time and effort for others. This may be a contributing factor aside from the fact that some are still hesitant especially when it comes to evaluation and conducting research. However, data that are usually derived from these provides support and bases on how to enhance professional development objectives (ISTE, 2014). Moreover, these activities can help schools in maintaining good standards by assessing the effectiveness of it. Hence, it is important to post challenges on making evaluation and research in order to maintain the effectiveness of technology in teaching and leadership.

**Table 3**

*Summary of Self- Efficacy*

<b>Indicators</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
Work Self- Efficacy	3.46	0.44	True to me
Instructional Self- Efficacy	3.50	0.42	Very true to me
Technology Integration Self- Efficacy	3.36	0.46	True to me
<b>Overall</b>	<b>3.44</b>	<b>0.44</b>	<b>True to me</b>

*Legend: 3.50-4.00 Strongly agree/Very true to me, 2.50-3.49 Agree/ True to me, 1.50-2.49 Disagree/ Partly true to me, 1.00-1.49 Strongly Disagree/ Not true to me*

Table 3 shows the summary of teachers' perception on self- efficacy. It can be gleaned that the overall mean is 3.44, which implies that teachers have a high perception on self-efficacy. It further suggests that the higher the level of self-efficacy the greater the individual's capability to accomplish a task that is required for him to do. Moreover, instructional self-efficacy got the highest mean of 3.50 revealing that teachers are aware of the needs to be considered when it comes to techno-pedagogical skills in teaching. In addition, developing awareness on values integration

in instruction using technology tools and applications and seeking assistance to colleagues with greater knowledge when it comes to technological application skills are present. Meanwhile, technology integration self-efficacy got the lowest mean of 3.36, revealing teachers generally have a high sense of technology integration self- efficacy. However, benchmarking other school's programs with regards to technology application in classroom settings is least priority for teachers. These results affirm that high self- efficacy is an important feature of teachers' expertise that merits inclusion in professional development programs (Celep, 2014) and teachers with high self- efficacy employ effective teaching tactics, provide classroom management, and minimize the proportion of learners with poor levels of success (Dibapile, 2012). School leaders must strive to promote teacher self- efficacy as a tool to improve teaching effectiveness. The result also agrees that teachers must have a requisite skill to profit from different forms of technology to ensure the expected improvement in incorporating technology in the educational process (Perkmen & Pamuk, 2011).

**Table 4**

*Summary of Instructional Performance*

<b>Indicators</b>	<b>Mean</b>	<b>SD</b>	<b>Interpretation</b>
Digital Pedagogy	3.37	0.43	High
Digital Learning Resources	3.39	0.44	High
<b>Overall</b>	<b>3.38</b>	<b>0.44</b>	<b>High</b>

*Legend: 3.50-4.00 Strongly agree/Very High, 2.50-3.49 Agree/High, 1.50-2.49 Disagree/Low, 1.00-1.49 Strongly Disagree/Poor*

Table 4 shows the summary of instructional performance as perceived by the teachers with an overall mean of 3.38 indicating teachers' agreement on the constructs that make up instructional performance. Moreover, it implies that teachers' concept on digital pedagogy may contribute to their confidence in using digital learning resources in their teaching. In this regard, it is always important to look for ways to cope and be updated on the modern ways of teaching especially at this new normal setting. According to Wadmany and Kliachko (2014), the use of technology in teaching is a major characteristic of digital pedagogy; yet, its benefits cannot be achieved without appropriate pedagogy. In order to adopt digital pedagogy, the teacher's and students' roles must

change. The teacher's role is to facilitate learning by using student-centered teaching approaches, allowing students to take charge of their own learning, and encouraging collaborative learning. Moreover, educators must collaborate in the contemporary era to improve teaching efficiency, allow students to enjoy learning, and develop a new generation with creative and rational communication and critical thinking skills through the use of technology and network information. Students must actively participate in learning activities in order to achieve the desired learning outcome (Pai & Tu, 2011).

**Table 5**

*Significant Prediction of Self- Efficacy on the Preparedness of Technology Leadership*

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.878	.105		17.958	.000
Systematic Development	.453	.030	.584	15.102	.000

R = .584; Adj.  $R^2 = .340$  F(1, 440) = 228.062; p <.01

Regression Equation:  $SE = .453 SD + 1.878$

Where SE= Self- Efficacy; SD= Systematic Development

Table 5 shows the significant prediction on preparedness of technology leadership to self-efficacy of teacher respondents. Multiple linear regression was conducted with self-efficacy of the teachers as the dependent variable to the five (5) constructs of preparedness on technology leadership of the school leaders as the independent variables. The multiple regression analysis revealed that the systematic development contributed significantly to the regression model F (1,440) = 228.062; p < .01 and accounted for 34% of the variation in the level of self- efficacy. Hence, the model suggests that the systematic development significantly predict the self- efficacy of the teacher respondents which produce the final regression:

$$SE = .453 SD + 1.878$$

where:

SE= Self-Efficacy;

SD= Systematic Development

The equation further justifies that for every 1- unit increase in the self-efficacy score, there is a corresponding .453 unit increase in systematic development keeping the other factors constant.

This indicates that in a great extent systematic development greatly affects the preparedness of technology leadership of school leaders which also affects teachers' self-efficacy. It can be justified by the way a school leader scans his colleagues' capabilities and entrusts them with tasks that involves the use of technology. By doing so, it affects the perception of teachers towards their self-efficacy. It also implies that school leaders should always consider the value of having an assessment and data regarding their colleagues' capabilities in order to provide tasks that will enhance their self-efficacy. It coincides with the heart of systematic development which is data-driven decision-making which focuses on working together to gather, analyze, interpret, and share information about staff while investing in technological infrastructures. With this, there will be a possibility in attracting and retaining tech-savvy teachers (ISTE, 2014). Moreover, alongside focusing on maximizing self- efficacy, school leaders should also put attention on addressing the needs of the school and teachers when it comes to infrastructure and development by tapping experts and stakeholders to provide support in achieving the goals of the institution.

**Table 6**

*Significant Prediction of Self- Efficacy on the Promotion of Technology Leadership*

	Unstandardized Coefficients		Standardized Coefficients		Sig.
	B	Std. Error	Beta	T	
(Constant)	1.878	.100		18.851	.000
Technology and Infrastructure Support	.236	.054	.319	4.341	.000
Vision, planning, and management	.219	.052	.309	4.202	.000

R = .605; Adj. R<sup>2</sup> = .363 F(2, 439) = 126.456; p <.01

Regression Equation: SE= .236 TIS+ .219 VPM+ 1.878

Where SE= Self- Efficacy; TIS= Technology and Infrastructure Support; and VPM= Vision, planning, and Management

Table 6 shows the significant prediction on the promotion of technology leadership to the self- efficacy of teachers. Multiple linear regression was used with the self- efficacy of teachers as the dependent variable to the five (5) constructs on the promotion of technology leadership of the school leaders which includes vision, planning and management, staff development and training, technology and infrastructure and support, evaluation and research, and interpersonal and communication skills as the independent variables. The multiple regression analysis revealed that the technology and infrastructure and support and vision, planning, and management contributed

significantly to the regression model  $F(2,439) = 16.456$ ,  $p < .01$  and accounted for 36.3% of the variation in the level of self- efficacy of the teachers. Hence, the model suggests that the technology and infrastructure and support and vision, planning, and management contributed significantly predict the self- efficacy of the teachers which produce the final regression:

$$SE = .236 TIS + .219 VPM + 1.878$$

Where:

*SE* = Self- Efficacy

*TIS* = Technology and Infrastructure Support

*VPM* = Vision, planning, and Management

The equation further justifies that for every 1- unit increase in the self- efficacy score, there is a corresponding .236 unit increase in technology and infrastructure and support keeping the other factors constant. This reveals that school leaders' promotion of technology leadership as perceived by teacher respondents provides focus on providing support to them while addressing the need for infrastructure and its maintenance. When teachers feel that their needs are valued and addressed, they perform greater as what is expected from them and they develop a high sense of self- efficacy. Celep (2014) suggest school leaders ensure that adequate technology facilities are available, there is availability of technology resources, and school workers are supported when technical assistance is required. Moreover, they also need to ensure that equipment is repaired and maintained regularly. Thus, this implies that a great responsibility lies on the shoulders of school leaders in providing necessary help for teachers with regards to technology and infrastructure and support so that there will be greater chances of higher level of self-efficacy among them that they might exhibit.

Moreover, for every 1- unit increase in self- efficacy there is a corresponding .219 unit increase in vision, planning, and management keeping the other factors fixed. It is a great challenge for school leaders to develop a properly organized strategic plan that includes vision-driven strategies and policies that may effectively deal with the transition process especially at this moment. This implies that as a school leader having vision affects the perception of teachers in the promotion of technology leadership. It serves as the path where the school leader and his colleagues can walkthrough while focusing on their goal. Planning and management maintain the alignment of goals to be achieve which may later affect the ability of the teachers to view task



differently based on their level of self- efficacy. Weng and Tang (2014) suggest that providing vision- driven strategies will aid change management in establishing goals that are aligned with the organization’s vision and mission in achieving desired outcomes.

**Table 7**

*Significant Prediction of Instructional Performance on the Preparedness of Technology Leadership*

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.755	.116		15.102	.000
Systematic Development	.350	.052	.432	6.700	.000
Visionary Leadership	.119	.050	.155	2.400	.017

R = .562; Adj. R<sup>2</sup> = .312 F(2, 439) = 101.172; p <.01

Regression Equation:  $IP = .350 SD + .119 VL + 1.75$

Where IP= Instructional Performance; SD= Systematic Development; and VL= Visionary Leadership

Table 7 shows the significant prediction on preparedness of technology leadership to instructional performance of teacher respondents. Multiple linear regression was conducted with instructional performance of the teacher respondents as the dependent variable to the five (5) constructs of preparedness on technology leadership of the school leaders as the independent variables. The multiple regression analysis revealed that the systematic development and visionary leadership contributed significantly to the regression model  $F(2,439) = 101.172$ ;  $p < .01$  and accounted for 56.2% of the variation in the level of instructional performance. Hence, the model suggests that the systematic development and visionary leadership significantly predict the instructional performance of the teacher respondents which produce the final regression:

$$IP = .350 SD + .119 VL + 1.75$$

Where:

*IP= Instructional Performance;*

*SD= Systematic Development; and*

*VL= Visionary Leadership*

The equation further justifies that for every 1- unit increase in the instructional

performance, there is a corresponding .350 unit increase in systematic development maintaining the other factors constant. This reveals that to a great extent systematic development has a direct impact on the instructional performance of teachers. This means that when a school leader uses technology to drive change among his colleagues, involves experts and taps stakeholders to address the needs of the school when it comes to technology infrastructure and development, and supports his co-workers, the urge of teachers to perform well with regards to instruction is observable. Furthermore, Petko et al. (2018) address teachers who utilize technology require supportive principals at school and adequate technological infrastructure. Moreover, having school technology policies can be linked to good school administration (Weng & Tang, 2014). Thus, a school's financial capability and technological opportunity should be considered when developing technology policies, plans, or even professional practice for its staff (Banoglu, 2011).

Moreover, for every 1- unit increase in the instructional performance, there is a corresponding .119 unit increase in visionary leadership keeping other factors fixed. This reveals that to a certain extent the attainment of a goal is anchored on the way a school leader provides vision for his team. Teacher respondents viewed that when a school leader inspires, open to ideas, shares his plan for the school and collaborates with colleagues it has an effect in their instructional performance. It harnesses their ability to be more at ease in using tools that could be beneficial to their students since openness unlocks free- will and creativity. Moreover, providing vision also enlightens the mind of people to walk on the same path that they think to be beneficial for them. The result of visionary leadership in an academic setting is committing administrative staff to exert influence over the people who work alongside them to ensure the implementation of the best educational techniques and procedures. It is innovation that serves as the prerequisite of visionary leadership (Molina, 2018).

Table 8 shows the significant prediction on the promotion of technology leadership to instructional performance of teachers. Multiple linear regression was used with the instructional performance of teachers as the dependent variable to the five (5) constructs on the promotion of technology leadership of the school leaders which includes vision, planning and management, staff development and training, technology and infrastructure and support, evaluation and research, and interpersonal and communication skills as the independent variables.

**Table 8***Significant Prediction of Instructional Performance on the Promotion of Technology Leadership*

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	1.818	.109		16.754	.000
Technology and Infrastructure Support	.166	.072	.214	2.302	.022
Vision, planning, and management	.147	.061	.198	2.417	.016
Evaluation and Research	.143	.069	.188	2.056	.040

R = .572; Adj. R<sup>2</sup> = .323 F(3, 438) = 71.035; p < .01Regression Equation:  $IP = .166TIS + .147VPM + .143ER + 1.818$ 

Where IP= Instructional Performance; TIS= Technology and Infrastructure support; VPM= Vision, Planning and Management; ER= Evaluation and Research

The multiple regression analysis revealed that technology and infrastructure support, vision, planning and management, and evaluation and research the contributed significantly to the regression model  $F(3, 438) = 71.035$ ;  $p < .01$  and accounted for 57.2% of the variation in the level of instructional performance of the teachers. Hence, the model suggests that the technology and infrastructure and support, vision, planning and management, and evaluation and research of the teachers which produce the final regression:

$$IP = .166TIS + .147VPM + .143ER + 1.818$$

*Where:**IP= Instructional Performance;**TIS= Technology and Infrastructure support;**VPM= Vision, Planning and Management;**ER= Evaluation and Research*

The equation further justifies that for every 1-unit increase in instructional performance, there is a corresponding .166-unit increase in technology and infrastructure support keeping the other factors constant. To a certain extent, instructional performance is affected by technology and infrastructure support which indicates that when a school leader provides training for colleagues, taps stakeholders for the good of the school, ensures the functionality of available tools in teaching, and addresses technology needs of teachers it enhances the level of instructional performance.

Furthermore, advocating enough technology and infrastructure support for school members is one of the most crucial technology leadership attributes. Teachers can employ technology throughout the curriculum or to supplement a single lesson (Celep, 2014).

Moreover, for every 1- unit increase in instructional performance, there is a corresponding .147 unit increase in vision, planning and management keeping the other factors constant. The school leader's ability to share vision, involve colleagues in planning and delegate them in shared management increases the confidence of teachers in instructional performance by allowing them to apply what they know that their learners need and allowing them to be more free in choosing what is best in their teaching through various trainings and webinars that can enhance their instructional performance. Chang (2012) found that principal technology leadership may improve teacher's technology literacy and directly motivate them to adopt technology into their teaching, while teacher's technology literacy has a direct impact on teaching effectiveness. Thus, if a school leader has a great vision towards the use of technology and applies it in the workplace it can serve as a factor for teachers to follow and motivate themselves to enhance their technology literacy to improve instructional performance.

In addition, for every 1- unit increase in instructional performance, there is a corresponding .143 unit increase in evaluation and research keeping the other factors constant. Teachers' instructional performance is an avenue to assess their effectiveness in teaching therefore it also provides impact on the promotion of evaluation and research in order to maintain the standards of instruction or to enhance it. Moreover, evaluation and research open the door to examine portions of instruction that needs to be given more attention. Effective school leaders use evaluation systems that allow teachers and staff to be assessed against local standards and drive their professional development objectives (ISTE, 2014). According to Celep et al. (2014), evaluation of new and existing technology in evaluating benefits and educational impact should be part of effective technology leadership. As technology leaders, they must also assess the costs and benefits of educational technology strategies as well as monitor computer operating systems in both classrooms and laboratories. More importantly, principals should evaluate instructional technology utilization using district- level data. With this, it is important to maintain a high level of instructional performance of teachers. Therefore, school leaders must ensure that there should always be constant monitoring and evaluating of teacher performance so that possible enhancement can be addressed.

## 5. Conclusion

This study revealed that the parameter which predicted the self-efficacy towards the preparedness of technology leadership was systematic development. In addition, the parameters that predict the self-efficacy towards the promotion of technology leadership were technology infrastructure and support and vision, planning and management. Meanwhile, the parameters that predict the instructional performance towards the preparedness of technology leadership were systematic development and visionary leadership. On the other hand, the parameters that predict the instructional performance towards the promotion of technology leadership were vision, planning and management, technology and infrastructure support, and evaluation and research.

Given the results, it is recommended that teachers boost their self-efficacy by means of working with peers that can help them enhance their innate skill towards teaching especially with regards to technology. Doing reflection may also help in enhancing self-evaluation towards teaching performance so teachers can assess points that they are good at and points they need to develop further. To enhance further instructional performance, it is suggested that teachers be more active and familiar in using digital learning resources to cope up with the changing modality of learning. School leaders may provide initiatives to help teachers in enhancing their knowledge with regards to digital pedagogy via learning action cells or in-service training. Likewise, enhancing the skills of teachers towards digital learning resources may also help them in the present trend of learning. A similar study may be carried out to confirm or deny the findings of this study.

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