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Relationship Between Principals' Digital Leadership and Teachers' Digital Competency in Klang District Secondary Schools

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Abstract: Malaysia Education Blueprint (MEB, 2013-2025) provides comprehensive plan for sustainable transformation of Malaysia education to equip students for the future world scenario. In its seventh shift, leveraging ICT to scale up quality learning across Malaysia and developing globally competent youths has taken place in Malaysian schools in three waves since 2013 until 2025 (Ministry of Education, 2013). Simultaneously, the Covid19 pandemic has reduced the chances of conducting lessons in a traditional classroom setting. Due to this, formal school institutions are forced to adopt digital learning as a new platform for teaching and learning. Consequently, teachers and principals are required to be well versed and competent in the digital technology as they are forced to master digital teaching skills within a short time span. Schools have to equip the students with all the knowledge and skills necessary to survive in the era of "Internet of Things" and Artificial Intelligence. Teachers need to be digitally literate and inevitably the responsibility of bringing about change and preparing teachers and the school environment for IR 4.0 job market lies on the shoulders of the school principals. Nonetheless, both teachers and principals were unprepared to embrace the digital changes in the current educational scenario. This research explored the relationship between principals' digital leadership and teachers' digital competency in Klang district secondary schools. 354 respondents from 39 secondary schools participated in this research. Based on the data analysed that there is a significant positive relationship at a moderate level between the principals' digital leadership and the teachers' digital competency with a value of r =0.41 and p = .00 (p <0.05). It can be concluded that when principals' digital leadership is a moderate level, teachers' digital competency is also at a moderate level. In order to further enhance this digital leadership and teachers' digital competency, Ministry of Education, State Education Department (JPN) and District Education Office (PPD) must indeed take the initiative to provide ample training and knowledge related to digital leadership in order to better equip principals to lead schools.

Keywords: Principals' Digital leadership, Teachers' Digital Competency, Secondary Schools

1. Introduction

The rapid evolution of technology has changed almost all aspects of our lives. Inevitably it has also changed the education system. Education has to evolve once again to accommodate the demands of the 4th Industrial Revolution and the ramification of the COVID19 Pandemic. Distance learning and e-learning have been the solution to accommodate the constraints of not being able to meet physically in the traditional classrooms due to the lockdown imposed by most governments around the world (OECD, 2019). Teaching and learning in the past decade and even more so during the past two years has seen a tremendous shift. According to Singh and Chan (2014), the implementation of ICT is crucial to prepare the students to meet the demands of the digital age. Teachers, globally, regardless of the age or locality are forced to mastered teaching skills that involve using digital technology within a short time span. The Ministries of

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Education worldwide, immediately took steps to empower digital learning by pumping funding, tools and online trainings for schools to ensure that teaching and learning could still be carried out although not to its full capacity (Schleicher, 2020). Inevitably, the education world has to make changes in order to cope with the advancement of technologies and the uncertainties caused by Covid19. Many scholars have put forth the idea of digital education (Bonfield, Salter, Longmuir, Benson & Adachi, 2020; Hussin, 2018). These contributing factors have challenged the principals with the totally new requirements for adoption of emerging digital technologies. On account of that, principals need to emulate digital leadership skills. This is because management of schools in the current VUCA situation requires an agile approach to new skills development, emotional intelligence, transformation and change abilities, fast decision-making, and every day learning.

1.1 Digital Education in Malaysia

Malaysia Education Blueprint (2013-2025) provides comprehensive plan for sustainable transformation of Malaysia education to equip students for the future world scenario. Through its 5 system aspirations, 6 student aspirations and 11 shifts, developing globally competitive youths has taken place in the Malaysian schools vicinity in three waves since 2013 to 2025 (Ministry of Education, 2013). This initiative is supported by the implementation of 1Bestari.Net. Through the partnership with a corporate company YTL Communications, 10,000 primary and secondary schools were equipped with high speed internet connection to empower digital learning (Ministry of Education, 2012). Recently, the Malaysian government has introduced Malaysia Digital Economy Blueprint. This blueprint serves as the foundation to accelerate the development of digital economy and digital entrepreneurships. Consisting of six key truths, the fourth key thrust in this blueprint is to build agile and competent digital talent. In order to achieve this four strategies have been planned, two of which are directly related to education at primary to tertiary level. In strategy one the government plans to integrate digital skills at primary and secondary school level. Simultaneously, shifting focus of vocational and tertiary education from job-specific skills to competencies and adaptability (My Digital, 2019). The year 2020, has witnessed almost 100% of education process being done through the digital platform, from teaching and learning, to assessments and co-curricular activities were implemented online due to the restrictions placed by the Covid19 Pandemic has placed on the conventional school system. Traditional education practice and management have become obsolete with the introduction of technology in its system. The development of Google Classroom, Classroom Based Assessment, Project Based Learning and partnerships with private sectors to provide internship for students are among the excellent initiatives to prepare the Malaysian students in accordance with the nine trends in digital education.

1.2 Teachers, Principals and School Digital Transformation

In the classroom vicinity teachers are the ones who need to embrace digital transformation as they are the first respondents to the students' need for digital knowledge acquisition. Due to that, principals and school leaders are actually challenged with completely new requirements in adopting the emerging digital technologies and at the same time preparing teachers for the digital environment. This process requires the principals' proactive approach to new skill and expertise development while transforming themselves to ensure the schools readiness for technological revolutions. Scholars have argued that there is no clear one definition on school leadership (Bush,2007: Bush & Clover,2003: Lavigne & Olson, 2019). In the Malaysian context, principal is defined as the head of the school who is responsible in the overall management of the schools (Hoque, Abdul Razak & Mora, 2012). Senior assistants is defined as senior teachers who assist the principals in the administrative tasks and act as the second curriculum leaders after the principals (Basset,2016). When exploring digital leadership, it can be concluded that it has multifaceted layers before one can be considered as a digital leader. It involves more than having the knowledge on how to operate the device but into the abstract realm of communication and disseminating information (Yusof, Mohd Yaakob & Ibrahim, 2019). Viewed as technology leaders in the institution, principals should possess high digital competency (Yusof, Mohd Yaakob & Ibrahim, 2019). MEB has dedicated one chapter especially for teachers and school leaders as they are the main implementers of the blueprint which will determine its success or failure. In order to fully transform a school, inevitably principals have to be the catalyst to ensure change does take place. Northouse (2007) and Rowe (2007) described leadership as a process whereby an individual influences a group of individuals to achieve a common goal. Leadership is associated with individual characteristics of the leaders such as, beliefs, knowledge, values, and experience. Simultaneously, leadership is shaped by the way leaders react to the limitations and opportunities (Hallinger,2011). An effective organisation requires effective leaders who are capable of influencing people to embrace change in values, belief and behaviour to achieve the desired goals (Moo & Yazdanifard, 2015). In the Malaysian education landscape, principals are not only responsible to be

curriculum leaders but to other National Key Result Areas (NKRA) aspirations. These ambitions in Shift 5 of MEB are expected to be achieved via enhancing school leadership quality, and it is stressed that effective school leaders are not only managers but also instructional leader who can transform their school environment (MOE, Annual Report, 2016). Due to that, in order to become an effective transformational leader, principals need to adapt digital leadership approach so as to transform their schools effectively in this digital era. Therefore, this research is conducted to determine the relationship between teachers' digital competency and principals' digital leadership both theoretically and practically.

1.3 Problem Statement

Due to the digitalisation that is happening globally, teachers and principals also need to adapt to the changes that digitalisation brings to the education system. Students nowadays utilise digital gadgets to perform most of the tasks in daily life, including studying and completing school tasks (Hamzah, M.Nasir & Abdul Wahab, 2021). Nonetheless, teachers are not ready to embrace and utilize digital platform in teaching and learning due to various factors. According to Fong, Ch'ng and Por (2013) the integration of ICT in schools is still inadequate to achieve the aim stated in MEB 2013 – 2025. In addition, teachers especially in a certain age group are still lacking the digital skills needed to conduct virtual learning. Raman, Thannimalai and Ismail (2019) argued that the use of ICT in schools is still not satisfactory, in terms of both quality and quantity. Teachers are not prepared to jump into the digital wave since the principals are not transforming fast enough to be competent in equipping themselves and the teachers with digital literacy. Principals are the catalysts for change in the schools. They are to create a safe and secure environment for teachers and students to use digital teaching and learning platforms. Principals need to be digitally literate and competent and well equipped with the digital knowledge. This is deemed crucial and necessary to guide and lead all the school stakeholders to face the challenges of the digital world. This perception is aligned with Ayob (2012) when he exerted that principals are expected to be educational visionaries, curriculum and instructional leaders and assessment experts. Simultaneously, principals are expected to manage various digital applications and systems at school level as digital learning is fairly a new scenario in the Malaysian educational landscape. Due to that, principals have to equip themselves on the knowledge and skills needed to help prepare teachers and the school to accommodate the digital transformation. However, not all principals are aware of the opportunities for instruction that modern technology can provide. (Schleicher,2020). This is supported by Yusof, Mohd Yaakob and Ibrahim (2019) that principals were not fully ready to manage their schools digitally. According to Aldawood, Alhejaili, Alabadi, Alharbi and Skinner (2019) digital leadership and supervision is the key issue for the modern curriculum and hence, school effective management must include the multifaceted technological approach.

1.4 Research Objective

The objectives of the study are as below;

1. To determine the level of teacher's digital competency in Klang district secondary schools.
2. To determine the level of principal's digital leadership in Klang district secondary schools.
3. To determine whether there is a significant relationship between principals' digital leadership and teachers' digital competency in Klang district secondary schools.
4. To identify dimensions of principals' digital leadership predicting digital competency among secondary school teachers in Klang district.

2. Literature Review

2.1 Digital Literacy and Competency

Decades ago, being literate was about the ability to read, write and count. Nonetheless, with the advancement of technology, without any doubt digital literacy and competency have to be included in the definition of being a literate person. This is due to the fact that, new jobs that are related to digital literacy and competency have taken over the traditional jobs. Lawrence, Lim and Abdullah (2019) argued that some of the current occupations might no longer be relevant in the near future. Furthermore the industrial revolution is likely to cause degradation in human role due to the sophistication of digital machine causing limited or loss of job opportunity (Satria & Mustiningsih, 2019). Due to these factors, schools must be ready to accommodate this future job market needs by equipping themselves with principals and teachers who are digitally literate and competent. In education context, digital literacy heightens the conquest for knowledge by nurturing and nourishing critical thinking and utilise information for myriad purposes of the students' lives. This can be measured by the ability to recognize the need for information, locating it using a variety of media and technologies and evaluating information for effective purposes (Osterman, 2012). Schools that aim to produce digitally

literate students must move away from conventional lessons, classrooms and management (Hussin, 2018). The Covid19 pandemic has awakened the global citizens to the importance of being digital literate and competent. Schools, banks and businesses are among those who have to operate online. Teachers and principals are no longer able to monitor students in physical classrooms. Educators must be highly literate and competent in order to navigate online learning platform. Teachers are no longer the sole guardians of knowledge when everything is just a click away. (Schleicher, 2019). Simultaneously, principals have to play a role as digital literacy and competency advocators in ensuring all the school stakeholders are in the loop towards digital transformations.

2.2 Teachers' Digital Competency

School teaching and learning landscape have changed drastically in the past decade to accommodate the advancement in technology. Many scholars argued that digital competency has become an important skill to master (Zhong,2017;Sponte,et.al,2018 & Samath,2010). Using digital platform in teaching and learning is now deemed as inevitable (Raman,Thannimalai & Ismail, 2019). Due to that, teachers are seen as the catalyst to bring about change in teaching and learning by utilizing ICT in the classrooms. According to Singh and Chan (2014) school stakeholders have acknowledged the importance of ICT as the new medium for teaching and learning. Students need to be prepared for the demands of ICT in the real world. Undeniably the success of digital teaching and learning is shouldered by none other than the teachers (Al-Khateeb, 2017). Being competent digitally has now become a vital skill for the teachers as they need to adapt to the new way knowledge is being obtained and disseminated to the students. (Karakose, Polat, & Papakadis, 2021). According to Touron et al. (2018) there are five dimensions that need to be adhered to before a teacher can be considered as digitally competent. These five dimensions are;

2.2.1 Managing Information

Under managing information dimension, teachers are able to identify, search, retrieve, store and organize information they find on the Internet. They also must be able to navigate the search engines using appropriate key words in order to locate accurate information while ensuring the information is stored accordingly.

2.2.2 Communication and Collaboration

Being able to communicate and collaborate with other stakeholders using online platform and tools is another dimension in teachers' digital competency. The communication and collaboration is deemed as important skills due to the fact that role of teachers is to disseminate information. Teachers must be capable of navigating video conferencing and online data sharing so that teaching and learning can progress as planned. Furthermore, teachers must be able to select electronic resources for students as extended resources that will enhance their learning.

2.2.3 Creating Content

Sourcing information online is definitely inadequate as students come with different learning level and abilities. Teachers must be resourceful in creating their own digital learning content to cater for the different needs and multiple intelligence that the students possess. Adapting resources, websites or software which are readily available into the version that accurately caters to the students' ability is the characteristic of a digitally competent teacher.

2.2.4 Security

The next dimension in teachers' digital competency is the ability to protect private information, documents as well as the digital gadgets used. Teachers should be able to protect themselves and their devices with the usage of anti-virus software and password. Teachers are required to be aware of the consequences if they fail to take measures to protect themselves for instance by sharing their username or password with others.

2.2.5 Problem Solving

Technical problems or glitches are bound to happen when conducting online lessons or using digital devices. Therefore, teachers must equip themselves with basic knowledge on how to troubleshoot if problems occur while waiting for technical help to arrive. Simultaneously, teachers must be able to provide connectivity between devices or between the internet and the devices.

2.3 Principals and Digital Leadership

In the Malaysian context, emphasis on digital literacy has been placed since the introduction of MEB in 2013. The seventh shift of MEB aims to leverage ICT to scale up quality learning across Malaysia. With the introduction of this new policy, the previous curriculum has been replaced with the new one which embedded ICT in its subjects. As curriculum leaders, principals have to understand and internalised that digital transformation does not serve primarily to promote computer literacy but due to the fact that technology is deemed as inevitable commodity of the future (Hoque, Abdul Razak & Mora, 2012). Principals need to be proactive not to lag behind in the race for digital literacy. In order to survive in the rapidly changing digital transformation, applying technology is crucial for principals. They have to possess high digital literacy in order to be competent enough to lead the schools. According to Zhong (2017) Principals' attitude towards technology affects teaching effectiveness and teachers' ability of integrating technology into teaching. Simultaneously, they need to enlighten themselves with technology-related knowledge (Ottestad, 2013). Furthermore, principals who manage to create links, dynamic thinking, behavior, and the skills to transform and improve school culture through the use of technology are considered effective. These could be done by incorporating digital technologies such as mobile devices, communication and web applications towards a sustainable change in the use of technology at schools. The evolution in the digital world has not only changed the way lessons are conducted but also the way schools communicate with their stakeholders. Whatsapp and Telegram have replaced the traditional communication tools among schools stakeholders (Sheninger, 2014). Thus, principals have to be ready to face this new medium of communication so as to stay in the loop. There are seven elements which principals need to equip themselves in order to be effective leaders. Those elements are (1) communication (2) public relations (3) branding (4) professional development and enhancement (5) student learning involvement (6) opportunities (7) environments and learning space (Hilliard,2016; Sheninger,2014). When Covid19 infested the whole world the need for principals to be well equipped with digital literacy is more dire than ever. Instructions have to be circulated digitally to all the school stakeholders. Google Classroom is now way too familiar in the current teaching and learning process. With that comes Google Form and Google Meet which principals have to first master before insisting on teachers to do the same. In addition principals have to excel at administrating and delegating digital learning tools as a support system for teachers. Consequently, if principals are not prepared, inevitably the whole school system will disintegrate upon the rapid transformation of the digital world.

2.4 The Role of Principals in Developing Teachers' Digital Competency

There is a common conception that schools thrive well with high performing excellent principals. As a result of this, effective leadership has been the topic of scrutiny in the field of education for ages. The advancement of technology brings an entirely different set of challenges to the education sector. According to Samath (2010), leadership is about muddling through change victoriously. The role of principals in the present day is obviously varied from their predecessors. They are not only accountable to be effective leaders in managing the school physical resources but also to be knowledgeable and skilful enough to dive into the rapidly changing digital education scenario. Schools are now moving away from traditional classrooms where teachers are the guardians of knowledge to the world where information and virtual classrooms have taken over by storm and principals need to be well prepared with the rapidly changing demand of digital education (Karakose, Polat, & Papakadis, 2021). Numerous research have revealed the importance of effective leaders in boosting the schools' overall achievements and leading the schools into the known paradigm successfully. One of them is by Day, Harris, Hadfield, Tolley and Beresford (2002) who have conducted the most celebrated research on successful leadership which involves 14 countries worldwide. The International Successful School Principalship Project (ISSPP) presented various perspectives on successful leaders. Undeniably the role of school leaders brings a huge impact on the school performance. They are seen as the catalyst to lead and guide other stakeholders to realize the school mission and vision. In their hands lies the power to shape and influence the belief system, values and work ethics of the school community. Leaders are expected to lead by example, to showcase their ability to accomplish well the tasks they assign the teachers to do. Being role models is the key to gain trust that will eventually change the mind-set of the students and teachers alike to achieve the set goals and objectives (Hao & Yazdanifard, 2015). Damanik and Aldrigde (2017) agreed that trust can be developed by engaging school members in professional school interactions. High performing schools have principals who set clear goals and provide clear strategies on ways that the goals could be achieved. Schein (1995) claimed that leaders hold the power to assert organizational culture through various methods such as mentoring, role modeling, and teaching. Excellent schools features a focus on educational leadership, high academic achievement, organization, discipline, culture and a positive and conducive school environment (Jamilah et al.,2017). Principals have a great influence over the organizational excellence and achievement in schools so they must

equip themselves with great leadership, knowledge, skills and positive attitude. According to Leithwood, Louis, Anderson & Wahlstrom (2016), there are three main dimensions of successful principals (1) setting directions (2) developing people (3) redesigning schools.

2.5 International Society for Technology in Education (ISTE)

ISTE has initiated five dimensions for administrators in order for them to practise and implement digital leadership. The domains are visionary leadership, digital age learning culture, excellence in professional practice, systematic improvement and digital citizenship (ISTE, 2019).

2.5.1 Visionary Leadership

Under this domain the administrators are to inspire and lead the development and implementation of a shared vision for the comprehensive integration of technology. This is to promote excellence and support transformation throughout the organization. In visionary leadership, principals inspire and facilitate among all stakeholders a shared vision of purposeful change that maximizes use of digital age resources in order to meet and exceed learning goals. This can be done by supporting effective instructional practice and maximizing performance of district and school leaders. Digital leaders also will encourage the stakeholders to engage in ongoing development, implementation and communication in technology-infused strategic plans. Furthermore, under this dimension, principals play a crucial role in advocating policies, programmes and funding at district, state and national level. This can enhance the implementation of a technology-infused vision and strategic plan.

2.5.2 Digital Age Learning Culture

Principals are expected to create, promote and sustain an evolving and dynamic, digital age learning culture that provides a platform for a rigorous, relevant and engaging learning experience regardless of the students' background and socio-economic status. This is done by ensuring that improvised instructions are provided to students, focused on continuous development and improvement of digital age learning. Secondly, through modelling, principals act as the catalyst of frequent and effective use of technology for learning, simultaneously promoting the importance of digital literacy to the school community. Thirdly, principals must strive to provide student-centred environments catering for the unique and diverse needs of the students, that is equipped with technology and learning resources. Lastly, principals must be able to stimulate digital age innovation, creativity and collaboration by ensuring effective practice and its infusion across the curriculum in the study of technology. This digital age collaboration and innovation should happen at the local level by taking advantage of the myriad possibilities at the global community level.

2.5.3 Excellence in Professional Practice

Professional learning opportunities that empower teachers to enhance student digital learning are promoted by principals through the infusion of contemporary technologies and digital resources. This is achieved by [1] Allocating duration, resources and access to ensure ongoing professional growth in technological proficiency and integration, [2] Facilitating and participating in learning communities that stimulate, nurture and support the stakeholders in the study and use of technology, [3] Promoting and modelling effective digital age tools usage for communication and collaboration among stakeholders. [4] Staying updated with current educational research and emerging developments with regard to effective use of technology while encouraging continuous evaluation of digital advancement for their potential to enhance student learning.

2.5.4 Systemic Improvement

Under this dimension, principals practise digital age leadership, management and effective use of information and technology resources ensuring continuous improvement of the school. Changes initiated by principals should be meaningful in order to maximize the achievement of learning objectives. This is done through the recruitment of personnel ensuring competent, creative and proficient usage of technology. Furthermore, principals establish strategic partnerships to scaffold and main improvement in the system simultaneously providing a wide-ranging technological infrastructure.

2.5.5 Digital Citizenship

Principals assist the understanding numerous issues and responsibilities related to digital culture by ensuring equal access to appropriate digital equipment and resources to satiate the students' demand. In addition, principals inspire and cultivate shared cultural promoting understanding and involvement in global concerns and dispute through the usage of digital communication and collaboration devices.

3. Methodology

3.1 Research Design

This research has used a quantitative approach. Cross sectional questionnaire was administered in order as the instrument to gain insights of principals' digital leadership and teachers' digital competency. According to Cohen et al. (2018) questionnaires are deemed practical as they are easy to administer, cheap, reliable, and user friendly.

3.2 Population and Sampling

The population of teachers consists of 4236 teachers who are currently teaching in 39 secondary schools in Klang District, Selangor. The number of samples was determined using the sampling table by Krejcie and Morgan (1970). An appropriate sample size of 351 participants is selected by using convenient sampling method.

3.4 Research Insrument

This research adapted and integrated two instruments adapted from Teachers' Digital Competency (Touron, Martin, Asencio, Pradas & Inigo, 2018) and ISTE Standard for Administrators (ISTE-A), 2021. The questionnaire consists of three sections which are Section A, Section B and Section C. In Sections A, the demographic information consists of 4 questions (Age, Gender, Education Level & Years of Teaching). This helped to understand the cognitive level of the respondents. Section B contains questions to gauge Teachers' Digital Competency. The 37 questions are on Managing Information, Communication & Collaboration, Creating Digital Content, Security & Problem Solving. The last section which is section C is about Principals' Digital Leadership which consists of 36 items from 5 dimensions. Visionary Leadership, Digital Age Learning Culture, Professional Excellence, Digital Citizenship and Systemic Improvement. The researcher distributed the questionnaire to all the teachers involved, with permission from the school principals and state education department (JPN Selangor).

3.5 Validity and Reliability of Research Instruments

3.5.1 Research Procedures

The data was collected using a five-point scale cross sectional questionnaire that was distributed via Google Form to teachers in Klang District Secondary Schools. Due to the nature of the questionnaire being distributed virtually, a short introduction on the research was included in the Google Form.

The validity of this research instrument is important to ensure that the results obtained are meaningful. The instrument for this research has be validated by a lecturer from the Faculty of Education Administration of Universiti Putra Malaysia. Once the instrument was validated modification has been made based on the comment from the lecturer. This is done before the questionnaire was used in the pilot study and then in the actual research ensuring the level of validity of the instrument. The consistency of the scores obtained in the instrument is the main focus in reliability. The Croncbach Alpha (a) reliability test was used to test the reliability of the variables. There are two factors studied in this study, namely principals' digital leadership and teachers' digital competency.

Based on the table below after the analysis has been done, the value of the alpha coefficient for the questionnaire in part B that is related to teachers' digital competency in Klang district secondary schools is at 0.910 while part C which is related to the principals' digital leadership is at 0.913. This illustrates that the two instruments provide a very high level of reliability. Additionally, the research instrument is able to provide reliable data. The results of the Cronbach Alpha test that has been conducted are as in table 3.4 below.

Table 3.3 *Cronbach Alpha* Pilot Research

Section	Variable	Item No	Number of items	Cronbach Alpha Value
B	Teachers' Digital Competency	1-37	37	.910
C	Principals' Digital Leadership	1-38	38	.913

3.5.2 Pilot Research

A pilot study was conducted to prove the reliability and validity of the research instrument used. The pilot study also aims to ensure that the respondents understand each item in the questionnaire. Next, the reliability of the items in the questionnaire was determined through a pilot study using correlation analysis between items. In addition, a pilot study was also conducted in order to further refine the research question. Cronbach's Alpha Efficiency Value will be used to determine the reliability and validity of the questionnaire. To carry out this pilot study, the selected respondents are those who have the same characteristics as the actual study. The selected respondents are 30 secondary school teachers from a different state, who will not be involved in the actual study. The results of the pilot study show that the research instruments provide a very high level of reliability thus providing reliable data for the research.

3.5.3 Data Collection Procedures

There are several steps that need to be followed in the data collection procedure for this study. The first step is for the researcher to obtain approval from the Ethics Committee of the University of Putra Malaysia (JKEUPM). Researcher then applied for permission for this research to be carried out in Klang district secondary school from the Educational Research Planning and Development Division (BPPDP) through the Educational Research Application System Version 2.0 (ERAS 2.0). After obtaining permission from the BPPPDP, permission from the Selangor State Education Department was applied. Upon getting permission from the Selangor State Education Department (JPNS), the researcher distributed the research questionnaire to all 39 secondary schools through the principals. All the findings from the responses are confidential and will not be disclosed except for the purpose of this study.

3.6 Data Analysis

The descriptive statistical analysis involved mean and standard deviation. The interpretation of the mean score was based on a five-point Likert scale. A Pearson correlation statistical analysis was conducted to identify a significant relationship between principals' digital leadership and teachers' digital competency. The data was collected and analyzed using the Statistical Package for Social Sciences, SPSS version 26.0. The strength of the relationship between variables was determined by the value of the coefficient, r using the interpretation by Omat et al. (2019).

4. Research Findings and Discussions

4.1 Respondents' Demography

As shown in table, the first demographic factor is age, where there were 22 respondents aged between 20 – 29, followed by 119 respondents aged between 30 – 39. Meanwhile there were 82 respondents aged 40 – 49 who participated in this research. The last age group 50-59, has the largest number of respondents, 131. There were only 18.1% (64 responses) male teachers who participated in this research. The remaining 81.9 % (290 responses) were female respondents. Only 5 respondents (1.4%) with Ph.D answered the questionnaire. The rest of the respondents were degree holders with 301 respondents (85%). In addition, 48 respondents (13.6%) were master degree holders. The researcher further analyzed the respondent's data according to teaching experience which is the last demographic factor. There were 39 respondents (11%) who have been teaching less than 5 years. A total of 34 respondents (9.6%) have between 6 to 9 years of teaching experience under their belts. Next, the largest group of respondents (227, 64.1%) has been in service for nearly 29 years. While for the service period of 30 years and above, the distribution of respondents showed a total of 54 teachers (15.3%).

Table 1 Respondents' Demography

Demography	*Category*	*Frequency*	*Percentage*
Age	20 - 29	22	6.2
	30 - 39	119	33.6
	40 - 49	82	23.2
	50 - 59	131	37.0
Gender	Male	64	18.1
	Female	290	81.9
Education level	Degree	301	85
	Master	48	13.6
	Ph.D	5	1.4
Teaching Experience	Below 5	39	11.0
	6 -9	34	9.6
	10 - 29	227	64.1
	More than 30 years	54	15.3
	Below 5	39	11.0

4.2 Teachers' Digital Competency in Klang District Secondary Schools.

The first objective of this research is to determine the level of teachers' digital competency in Klang District Secondary School. Digital competency is the ability of the teachers to appropriately utilise knowledge, digital tools, skills and practices necessary in multiple formats to become a confident and active adopter of technology for personal, academic and professional use (Spante et al., 2018). Teachers who possess high level of digital competency are successful in implementing technological based learning despite lack of facilities available in the schools (Jannah, Prasojo, and Jerusalem, 2020).

There are five dimensions that determine the teachers' digital competency. They are Managing Information, Communication & Collaboration, Creating Digital Content, Security and Problem Solving. Based on the analysis done, teachers' digital competency is at an average level (M=3.1, SD=1.0). The contributing factors for this average score is most of the teachers were have low competency level when it comes to securing the information and the digital gadgets that they came across (M=2.7, SD=1.1). Simultaneously, the respondents scored a low mean in trouble shooting and problem solving (M=2.8, SD=1.0). This can be attributed to the lack of training given to the teachers with regards to online safety and technical issues (Vinathan, 2017). The teachers scored fairly well in the dimension of managing information (M=3.6, SD=0.96), creating digital content (M=3.2, SD=1.1) and in the dimension of communication and collaboration (M=3.2, SD=1.0).

Table 2 Teachers' Digital Competency According to Dimension

Teachers' Digital Competency	**Mean**	**Standard Deviation**	**Score Interpretation**
Managing Information	3.6	0.96	High
Communication & Collaboration	3.1	1.0	Average
Creating Digital Content	3.2	1.1	Average
Security	2.7	1.1	Low
Problem Solving	2.8	1.0	Low
Overall	3.1	1.0	Average

4.3 Principals Digital Leadership Level in Klang District Secondary Schools

The second objective of the research is to determine the level of principals' digital leadership in Klang District Secondary Schools. Digital leadership is defined as being digitally literate and proficient as to lead and provide support to all personnel under his or her supervision (Zhong, 2017). International Society for Technology in Education (ISTE, 2019) has initiated five dimensions for principals in order for them to practise and implement digital leadership. The dimensions

are visionary leadership, digital age learning culture, excellence in professional practice, systematic improvement and digital citizenship.

Based on these five dimensions of leadership, visionary leadership has the highest score (M=3.6, SD=0.88). The second dimension with the highest means is systemic improvement, (M=3.5, SD=0.84). Meanwhile the rest of the dimensions shared the same mean score, digital age learning culture (M=3.4, SD=0.91), professional excellence (M=3.4, SD=0.94) and digital citizenship (M=3.4, SD=1.0). Based on these findings it can be concluded that the principals' digital leadership is at a moderate level (M=3.5, SD=0.91)

Table 3 Principals' Digital Leadership According to Dimension

Principals' Digital Leadership	Mean	Standard Deviation	Score Interpretation
Visionary Leadership	3.6	0.88	High
Digital Age Learning Culture	3.4	0.91	Average
Professional Excellence	3.4	0.94	Average
Digital Citizenship	3.4	1.0	Average
Systemic Improvement	3.5	0.84	Average
Overall	3.5	0.91	Average

4.4 Relationship between Principals' Digital Leadership and Teachers' Digital Competency in Klang District Secondary Schools.

The third objective of the research is to determine the relationship between principals' digital leadership and teachers' digital competency. Analysis for both variables was done using Pearson Correlation in the statistical software IBMM SSPS Statistics 26. To determine the statistical significance between principals' digital leadership and teachers' digital competency, a Pearson correlation was run. The correlation test was used to determine if there was a relationship between each dimension for both variables as a whole. There were moderate relationships, with a direct positive correlation found between all five dimensions for both principals' digital leadership and teachers' digital competency. When examining principals' digital leadership (N = 354) of dimension 1: Visionary Leadership, the strength of the association between variables was moderate, (r=0.48, p=.00) was found to be significant (p < .001). When examining dimension 2: Digital Age Learning Culture, the strength of the association between variables was the moderate (r=0.49, p=.00) was found to be significant (p < .001). When examining principals' digital leadership of dimension 3: Professional Excellence, the strength of the association between variables was moderate (r=0.41, p=.00) was found to be significant (p < .001). When examining dimension 4 of principals' digital leadership: Digital Citizenship, the strength of the association between variables was moderate (r=0.34, p =.00) was found to be significant (p <.001). Dimension 5: Systemic Improvement, the strength of the association between variables was moderate (r=0.34, p=.00) was found to be significant (p <.001). All the dimension for principals' digital leadership showed a positive moderate correlation with teachers' digital competency dimensions (r=0.41, p=.00) significant p<.001. Based on these findings, it can be concluded that the moderate score in principals' digital leadership has influenced the teachers' digital competency which is also at an average level.

Table 4 Correlation between Principals' Digital Leadership Dimensions with Teachers' Digital Competency Dimensions.

	Teachers' Digital Competency		
Principals' Digital Leadership	**R**	**P**	**Level**
Visionary Leadership	0.48	.00	Moderate
Digital Age Learning Culture	0.49	.00	Moderate
Professional Excellence	0.41	.00	Moderate
Digital Citizenship	0.34	.00	Moderate
Systemic Improvement	0.34	.00	Moderate
Overall	0.41	.00	Moderate

4.5 Factors Predicting Principals' Digital Leadership among Secondary Schools Teachers in Klang District.

A study was conducted to identify factors predicting principals' digital leadership among Klang district secondary schools' teachers. Based on the Multiple Linear Regression analysis done, Managing Information was found to be the dimension that significantly predicts principals' digital leadership among secondary schools teachers in Klang district (r^2=0.29,p<.001). Followed by the dimensions of Security (r^2=0.22, p<.001) and Creating Digital Content (r^2=0.21, p<.001). Problem Solving is the least significant predictor with r^2 value of 0.21, p<.001. It can be concluded that Problem Solving is the highest predictor with nearly 29% of the variance.

Table 5 Factors Predicting Principals' Digital Leadership among Secondary Schools Teachers in Klang District

Teachers' Digital Competency	R	R Square	Adjusted R	Sig
Managing Information	0.53	0.29	0.28	.00
Communication & Collaboration	0.37	0.14	0.14	.00
Creating Digital Content	0.46	0.21	0.21	.00
Security	0.46	0.22	0.21	.00
Problem Solving	0.45	0.21	0.21	.00

4.6 Discussions

4.6.1 Teachers' Digital Competency

Teachers' digital competency in Klang district secondary schools is overall at an average level (meaning 3.08, sd 1.0). 4 dimensions tested (Communication & Collaboration, Creating, Digital Content, Security, Problem Solving) showed from low to average mean (2.7 –3.2). Nonetheless, one domain showed a high level which is managing information (mean 3.6, sd .96). Based on these findings it can be deduced that further training needs to be given to the secondary schools teachers in Klang district with regards to the dimensions that have low mean score. Digital tools and equipment should be upgraded in order to facilitate digital competency among teachers especially in the dimension of creating digital content and communication and collaboration as these two dimensions are deemed crucial in teaching and learning (Hamzah, M.Nasir & Wahab, 2021). Due to this, principals need to be proactive in providing the aformentioned digital training and tools so as to accelerate teachers' digital competency.

4.6.2 Principals' Digital Leadership

Klang district principals practised digital leadership at a moderate level (M=3.5, SD=0.91). Three dimensions, digital age learning culture, professional excellence and digital citizenship shared a similar mean of 3.4. Systemic Improvement dimension scored a mean score and standard deviation as stated, M=3.5, SD=0.84. The dimension which is at a high level is visionary leadership (M=3.6, SD=0.88). More training and resources should be provided to principals in the digital arena. They need to be proactive in equipping themselves with the digital knowledge deemed crucial to meet the demands in the seventh shift of MEB. In this current VUCA situation principals must be agile enough to practise digital leadership so as to ensure a smooth and effective management of school stakeholders and resources. Based on the findings of this research, principals need to step up their game as the responsibility in establishing and improving teachers' willingness to integrate digital teaching and learning lies on the principals' shoulders (Hamzah, M.Nasir & Abdul Wahad, 2021).

4.6.3 Relationship between Principals' Digital Leadership and Teachers' Digital Competency in Klang District Secondary Schools.

The research findings depicted a moderate positive relationship between principals' digital leadership and teachers' digital competency in Klang district secondary schools. Principals' digital leadership dimensions show a positive moderate correlation with teachers' digital competency dimensions (r=.41, p=.00). The first dimension which is Visionary Leadership is at a moderate level (r=.48, p=.00) followed by Digital Age Learning Culture which is also at a moderate level (r=.49, p=.00). Another dimension that scores a moderate correlation is Professional Excellence (r=.41, p=.00). The other two dimensions for principals' digital leadership is Digital Citizenship (r=.34, p=.00) and Systemic Improvement (r=.34, p=.00) also have moderate correlation. Based on these findings, it can be concluded that the moderate score in principals' digital leadership has influenced the teachers' digital competency which is also at an average level.

4.6.4 Dimensions of Principals' Digital Leadership Predicting Digital Competency among Secondary Schools Teachers in Klang District.

A Multiple Linear Regression was calculated to determine the dimensions of principals' digital leadership predicting digital competency among secondary schools teachers in Klang district. Problem Solving significantly predict digital competency among secondary schools teachers in Klang district ($F(1,352) = 140.104$ $p<.00$) with an R^2 0.29. It can be summarized that Managing Information is a significant predictor of the variance in teachers' digital competency.

5. Recommendations and Conclusion

The purpose of the research was to examine the nature of the relationship between principals' digital leadership and teachers' digital competency in Klang district secondary schools. The analysis of this research found that there is a moderate relationship between principals' digital leadership and teachers' digital competency suggesting that there is still room for improvement for principals to nurture teachers' digital competency. The implications of the results of this research will contribute in general to the Malaysian Ministry of Education, State Education Department and District Education Office in terms of the theory, practices and policy making. More training, resources and facility should be provided to principals as well as the teachers in the digital arena. Additionally, the findings of the research will have an impact on secondary school teachers' digital practices in the country. They need to be proactive in equipping themselves with the digital knowledge deemed crucial to meet the demands in seventh shift of MEB. Simultaneously, the findings of this research contribute to principals' digital leadership and teachers' digital competency. The impact on principals' digital leadership theory refers to its five dimensions, namely Visionary Leadership, Digital Age Learning Culture, Professional Excellence, Digital Citizenship and Systemic Improvement. Furthermore, this research has impacted the leadership style practice by the principals in order to better manage schools under their administration. In this current VUCA situation principals must be agile enough to practise digital leadership so as to ensure a smooth and effective management of school stakeholders and resources. Based on the findings, there is only a moderate relationship between principals' digital leadership and teachers' digital competency. Due to that there is still room for improvement for both variable as to strive for a strong correlation.

The findings of this research supported previous researches that there is a loophole between principals' digital leadership and teachers' digital competency, a much needed synergy to create a digital environment. Yusof et al (2019) stated that the principals in Malaysia have yet to fully utilise and implement the construct and dimension of digital leadership. Based on the findings of this research, principals need to step up their game as the responsibility in establishing and improving teachers' willingness to integrate digital teaching and learning lies on the principals' shoulders (Hamzah, M.Nasir & Abdul Wahad, 2021). Therefore, principals must be able to identify the digital skills needed by the teachers in their respective schools so that proper and suitable trainings can be devised and administered. Principals also must be aware that being digitally competent requires more than just being able to manage information. The teachers must be equipped with knowledge on security and basic problem solving skills. Although the schools now have come back to their traditional classroom setting, teaching and learning must now be geared towards digital based learning. This is due to the fact that the students who have experienced the marvels of learning using technology would find traditional pedagogy rather dry and non-engaging. Alternatively, MOE and Institut Aminuddin Baki (IAB) can utilise the findings from this research to reform the course structure that is currently being used by the NQPEL participants. More input should be given to the principals on the dimensions and the characteristics of digital leaders. Principals must be groomed to practise digital leadership in order to ensure that the seventh shift in PPPM suggested in the third wave of MEB and the objectives in MyDigital (2021) can be achieved.

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