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What Are The Notable Concepts In Measuring Digital Leadership Among Teachers?

Nurhafizah Abdul Musid[1], Mohd Effendi@Ewan Mohd Matore[2] & Aida Hanim A. Hamid[2]

[1] Faculty of Education, The National University of Malaysia (UKM), 43600 Bangi, Selangor, Malaysia
[2] Research Centre of Education Leadership and Policy, Faculty of Education, The National University of Malaysia (UKM), 43600 Bangi, Selangor, Malaysia
Correspondence: Mohd Effendi@Ewan Mohd Matore, Research Centre of Education Leadership and Policy, Faculty of Education, The National University of Malaysia (UKM), 43600 Bangi, Selangor, Malaysia. E-mail: effendi@ukm.edu.my

Abstract

There is increasing trend in research on digital leadership recently. However, research on variables used in measuring digital leadership among teachers is not greatly discussed in educational field. Therefore, this study aims to identify and explain significant variables which commonly used in measuring digital leadership among teachers. This paper has referred to a few papers related to digital leadership in educational field. As a result, there are 10 important variables that has been identified in measuring digital leadership among teachers which are excellence in professional practice, digital age learning culture, digital citizenship, visionary leadership, systemic improvement, communication, use of digital technology, public relations, learning space and environment, and students' learning and engagement. Therefore, it is suggested to conduct an in-depth study on identifying subconstructs for these ten variables and a study for determining the level of digital leadership among teachers in Malaysia.

Keywords: digital leadership, variables, measurement, education, teacher

1. Introduction

Digital leadership is one of the most crucial types of leadership, which receives a lot of concern in schools currently (Judy Dasruth, 2020). According to Brown (2014), the term "digital leadership" refers to school administrators, instructors, and technology professionals who believe in the importance of technology and become aware of it in improving students' experience at all levels. To be more exact, digital leadership leads to changes in the use of digital devices in educational management (Hafiza Hamzah et al., 2021). To measure the level of digital leadership, an assessment should be conducted.

Assessment is a measurement which is used to discover an attribute of an individual or a group of people (Brown, 1990). In conducting assessment, variables play an important role. Variable is fundamental characteristic and ingredient which is needed in every aspect of research (Adegun, 2005). A variable is something that can be control and manipulate in experimental research (Abiodun-Oyebanji, 2017). To be more specific, variables are concepts that can be divided into two or more groups or categories which are known as attributes (Abiodun-Oyebanji, 2017). Therefore, this paper

aims to explore variables needed in assessing digital leadership.

2. Variables

There are a few variables found in literature which are relevant in assessing digital leadership. The literature was drawn from three databases: (i) Scopus, (ii) Web of Sciences and (iii) Google Scholar. The timeline chosen for the literature was from 2014 till 2022 (eight years). Initially, there were at least 25 variables found in the literature, and only 10 variables which show the highest frequency had been chosen for this study. Next, these 10 variables are arranged according to the number of studies in decreasing order. Table 1 shows a list consists of 10 significant variables in assesing digital leadership.

Table 1. Variables in assessing digital leadership

No.	Variables	No. of Studies	Citations
1	Excellence in professional practice	12	(Agustina et al., 2020a; 2020b; Aksal, 2015; AlAjmi, 2022; Augusto Riveros, 2015; Garcia & Abrego, 2014; Hafiza Hamzah et al., 2021; Ismail et al., 2021; Omar & Ismail, 2021; Rusnati & Gaffar, 2021; Sheninger, 2019a; Zhong, 2017)
2	Visionary leadership	10	(Agustina et al., 2020a; 2020b; Aksal, 2015; AlAjmi, 2022; Garcia & Abrego, 2014; Hafiza Hamzah et al., 2021; Ismail et al., 2021; Omar & Ismail, 2021; Suksai et al., 2021; Zhong, 2017)
3	Digital age learning culture	8	(Agustina et al., 2020a; 2020b; AlAjmi, 2022; Garcia & Abrego, 2014; Hafiza Hamzah et al., 2021; Ismail et al., 2021; Omar & Ismail, 2021; Zhong, 2017)
4	Systemic improvement	8	(Agustina et al., 2020a; 2020b; AlAjmi, 2022; Garcia & Abrego, 2014; Hafiza Hamzah et al., 2021; Ismail et al., 2021; Omar & Ismail, 2021; Zhong, 2017)
5	Digital citizenship	7	(Agustina et al., 2020a; 2020b; AlAjmi, 2022; Hafiza Hamzah et al., 2021; Ismail et al., 2021; Omar & Ismail, 2021; Zhong, 2017)
6	Communication	6	(Aksal, 2015; Augusto Riveros, 2015; Mat Rahimi Yusof et al., 2019; Rusnati & Gaffar, 2021; Saraih et al., 2022; Sheninger, 2019a)
7	Use of digital technology	3	(Avidov-Ungar et al., 2020; Karakose et al., 2021; Suksai et al., 2021)
8	Public relations	3	(Augusto Riveros, 2015; Saraih et al., 2021; Sheninger, 2019a)
9	Learning space and environment	2	(Augusto Riveros, 2015; Sheninger, 2019a)
10	Students' learning and engagement	2	(Augusto Riveros, 2015; Sheninger, 2019a)

The first variable which is crucial in measuring digital leadership is excellence in professional

practice. To promote teachers' professional development is the important role of school principal in this digital age (England, 2018). To be more exact, the key factor influencing professional growth in digitalization at school level is the role of school leaders and their competence which strategically lead for digitalization and pedagogical development (Håkansson Lindqvist & Pettersson, 2018). As a result, teachers may develop leadership skills which will be very useful in conducting online classroom (Rusnati & Gaffar, 2021).

The second variable which contributes in assessing digital leadership based on the literature review is visionary leadership or being visionary. Visionary leaders consider the influence of new technologies on teaching and learning (Lim & Teoh, 2022). Visionary leadership is one of the most popular leadership practice dimension and visionary leaders seems to be more open towards new knowledge and persist in incorporating technology-assisted innovation aspects (Macatuno-Nocom, 2019). Visionary leadership refers to one's capacity to lead and encourage a common vision as well as its development and implementation to synthesise technologies in order to accomplish organisational transformation and excellence (International Society for Technology in Education, 2009). However, a study by Lim & Teoh (2022) found out that visionary leadership does not have significant positive relationship with the performance of digital leadership in Malaysian private higher education institutions.

Next, relevant variable in measuring digital leadership is digital age learning culture, which involves the process of developing, fostering, and maintaining the culture of digital age learning so that all learners are equipped with a relevantly engaging and rigorous educational environment (International Society for Technology in Education, 2009; Salamzadeh et al., 2021). A study by Lim & Teoh (2022) shows that digital age learning culture has positive effect towards Malaysian private higher education institutions performance. In addition, this study suggests that higher education institutions to develop and promote digital age learning culture, considering that we will go into the digital and artificial intelligent era via digital age tools like smartphones, computers and tablets (Lim & Teoh, 2022).

The fourth variable in assessing digital leadership is systemic improvement. Systemic improvement has been recognized as one of the five dimensions which must be possessed by administrators (International Society for Technology in Education, 2009). Systemic improvement is an effective usage of information and technology which provides leaders to conduct a digital era leadership style in order to promote the performance of an organization (International Society for Technology in Education, 2009). Štrukelj et al. (2019) define systemic improvement by way of the efforts of school leaders in producing a continuous improvement system in digital learning while providing necessary skills to learners in order to develop competencies of their own. A study in Kuwait shows leaders have high level of systemic improvement (AlAjmi, 2022). However, a study in Malaysia by Lim & Teoh (2022) shows the non-significant positive relationship between systemic improvement and the performance of Malaysian private higher education institutions.

The fifth variable commonly used in assessing digital leadership is digital citizenship. Digital citizenship is a construct found in a few digital leadership studies by AlAjmi (2022); Hafiza Hamzah et al. (2021); Ismail et al. (2021); Omar & Ismail (2021) and Zhong (2017). Digital citizenship means acceptable, responsible and ethical use of technology besides emphasizing more on collaborative, self-empowering and creative technology usage in education (Dotter et al., 2016), including personal use (Walters et al., 2019). To the current context, digital citizenship is related to the use of technology and internet not only as norms

but also for proper conduct and online society engagement (Choi, 2016).

The sixth variable is communication. Communication is fundamental to leadership including to school leaders (Bass, 2000; Harris, 2009). A two-way communication between school community and the stakeholders shows an effective communication (Saraih et al., 2022). There a few purposes of communication which are coordinating and completing tasks, and decision making (Ayub et al., 2014). In digital leadership, social media is a virtual communication to achieve the purpose of communication (Saraih et al., 2022).

The seventh variable is use of digital technology. Since the late 1990s, digital technology usage in education has accelerated (Singh, 2021). Some literature refers this variable as technology use, technological component, use of digital, digital technology usage in the managerial context, digital technology support and management, digital technology usage in measurement and evaluation, and ethics in the use of digital technology. Most countries attempted to address face-to-face learning problems through various methods or forms of online learning in the initial Covid-19 pandemic phases, and there was a responsibility and obligation for instructors and administrators to educate using digital technology in the middle of this pandemic (Karakose et al., 2021). Digital technology usage in the classroom has been growing rapidly in developed countries and some teachers believe that using digital technology is advantageous, especially in the current information technology era (Singh, 2021). A study by Wekerle et al. (2022) has evidenced the strong potential of digital technology in supporting the learning process as well as enhancing student outcomes in higher education. This is line with a study by Singh (2021), which states that the goal of introducing digital technology into the classroom is to improve efficiency and obtain the best possible results, besides supporting the role of teachers.

The eighth variable is public relations. Current development shows that public relations in school has become a critical component of the 21st century public school administration (Lopez, 2017). Schools need to practice strong public relations to obtain support for school achievement from stakeholders (Çoruk, 2018). The integration of social media tools into public relations practice is an evident effort in conveying a clear idea of any progress or achievement in school to the stakeholders (Saraih et al., 2021). Social media also provides additional opportunities for establishing relationships between the public and the public relations practitioners (Kelleher & Sweetser, 2012). For example, a study in Malaysia found that public relations is an important element of digital leadership and social media has served as the modern public relations channel for role model school principals in Malaysia (Saraih et al., 2021). It is because social media is a useful tool that public relations practitioners can use to enable organisations to have strong and long term relationships via dialogues with audiences (Briones et al., 2011).

Next, the ninth variable that seems relevant in measuring digital leadership is learning space and environment (Sheninger, 2019b). School administrators are mostly after the establishment of a shared vision for institutional excellence, including digital learning culture, innovation, professional learning environments, and information technology (International Society for Technology in Education, 2009; Westerman et al., 2014). Throughout the pandemic of Covid-19, school administrators should make it easier for students to use technology in the classroom (Aksal, 2015; Antonopoulou et al., 2020). A conducive learning environment will help teaching and learning process which brings benefit to teachers and students.

Finally, another relevant variable which plays important role in assessing digital leadership is

students' learning and engagement (Sheninger, 2019b). Digital leadership in schools ensure school leaders engage in learning and innovation (Rusnati & Gaffar, 2021). Learning is a dimension or component which is crucial to lead a successful organization through dynamic change (Van Laar et al., 2017). School leaders who possess digital leadership may contribute to school's professional ethos, embrace and support innovation, learning and development among teachers (Sterrett & Richardson, 2020). Educators should assist students by designing and facilitating learning so the students are well-informed of not only the future trends but also technological applications and ethical aspects (Allen, 2020).

3. Discussion

There are similarities between these 10 variables. Four variables namely learning space and environment, students' learning and engagement, digital age learning culture and use of digital technology related to the usage of technology during the process of teaching and learning. In the wake of Covid-19, the education system and schools have undergone a massive digital change in order to fulfill the needs of digital future and the younger generation (Iivari et al., 2020). Digital leadership is defined as a management and administrative vision that can support current digital transformation needs by ensuring overall quality management of all stakeholders in terms of motivating, coordinating, and evaluating efforts to improve teaching and learning, particularly throughout the pandemic of Covid-19 (Damayanti & Mirfani, 2021).

In digital leadership, successful appplication of technology in teaching and learning process requires active involvement of school administrators (Dogan, 2018; Prince, 2018). Having excellent digital abilities during the pandemic was crucial for not only school leaders at all levels but also teachers (Karakose et al., 2021). Another two variables which shows similarities between them are communication and public relations. Effectual communication is crucial in education (Khateeb et al., 2021). The aim of having communication and public relations is to deliver information and idea to other person or party. This can be observed through usage of social media in communication and public relations which are two characteristics of digital leadership (Scicluna, 2020).

The remaining four variables show differences among them in terms of definition and context of the variables. Digital citizenship is related to behaviour and ethical use of technology in education (Choi, 2016; Dotter et al., 2016) while excellence in professional practice refers to strategic leadership towards digitalization and the development of pedagogy in school (Håkansson Lindqvist & Pettersson, 2018). Another variable is visionary leadership which is the ability to lead and inspire a shared vision to synthesise technologies for organisational excellence (International Society for Technology in Education, 2009) while systemic improvement is about producing a continuous improvement system in digital learning while providing necessary skills to learners (Štrukelj et al., 2019). These four variables are relevant for leading a group of people in school or in a classroom as administrators and teachers.

Among 10 variables identified earlier, only five variables act as key variables in measuring digital leadership namely professional practice excellence, followed by visionary leadership, digital age learning culture, systemic improvement, and digital citizenship. Firstly, professional practice excellence can establish the responsibility of educators in promoting professional learning and innovation where educators are allowed to improve student learning by incorporating contemporary technologies and digital resources for the allocation of time, access, and resources that guarantees

continuous professional growth in technology fluency (International Society for Technology in Education, 2009). Secondly, visionary leadership. A leader who possess visionary leadership is able to formulate a a vision for an organization's future that is practical, trustworthy, and appealing (Makhrus et al., 2022).

Thirdly, digital age learning culture will bring benefits for students. Education is an important domain that fosters the successful incorporation of digital technology and modern education system; hence, the infusion of digital technology in the classroom is required (Singh, 2021). Therefore, it is also imperative that teachers have the necessary skills related to digital technology. However, digital technology usage in education may further help distinguish education between the urban and rural sectors (Singh, 2021).

Next, the forth significant variable in assessing digital leadership are systemic improvement. This is because systemic improvement creates a channel for any leadership changes without causing instability as it maintains high standards of efficiency in the short and long term of leadership process (AlAjmi, 2022). Furthermore, systemic improvement contributes to enhance the variety in digital leadership areas which requires improvement or adjustment (Kane et al., 2019). The final significant variable in measuring digital leadership is digital citizenship. More research on systemic improvement and digital citizenship should be conducted in order to equip leaders to overcome challenges in the dynamic environment of educational field and Malaysia needs to be concern on this part (Lim & Teoh, 2022).

Digital leadership defines as a practice by using digital resources to influence others who will help in achieving organizational goals (Masrur, 2021). Therefore, these five variables namely professional practice excellence, digital citizenship, systemic improvement, digital age learning culture, and visionary leadership are considered relevant in measuring digital leadership. It is because it encompasses the digital leadership ecosystem, which includes both giver and receiver of this leadership style. Students will benefit from digital leadership since it is compatible with the 21st century teaching and learning. School administrators and teachers play a significant role in implementing digital leadership.

Furthermore, these five variables are believed to provide sufficient data for assessing digital leadership. It is because there are well-established variables that are commonly employed as constructs in digital leadership research in both overseas and Malaysia. A study's validity and reliability will be improved by using well-established constructs. Besides, it will help in improving the accuracy of a study's findings. If relevant constructs are not included in a study, the results will be inaccurate since the study will not measure what it is supposed to assess, and the conclusions will be questioned by others.

4. Recommendation

The findings in this study has shed light which is important for future research. Firstly, an in-depth study should be done on identifying subconstructs for the ten variables stated earlier. In measuring digital leadership, potential subconstructs will help to assess intended variables accurately. It is because subconstructs will form the categories while constructs will form the themes (Mat Said et al., 2021). Hence, the selection of relevant subconstructs and constructs are crucial in conceptualising digital leadership.

Secondly, another dimension that should be the major focus for future research is the assessment of digital leadership. Researchers should conduct a study to identify the level of digital leadership among teachers. Teachers employed technology to support students in

studying throughout the pandemic through various online platforms, culminating in a substantial change toward technology integration and digital leadership (AlAjmi, 2022). By identifying the level of digital leadership, a comprehensive training could be proposed to teachers. It is because appropriate training is required for the specific skills needed (Bekele, 2020) which refers to skills in digital leadership. Therefore, assessment should be conducted as it can provide feedback to researchers (Tosuncuoglu, 2018).

5. Conclusion

The present conceptual paper has identified ten variables in measuring digital leadership: professional practice excellence, digital age learning culture, visionary leadership, systemic improvement, digital citizenship, communication, use of digital technology, public relations, learning space and environment, and students' learning and engagement. This study has proposed relevant variables in assessing digital leadership among teachers. Hence, it will help teachers to possess digital leadership in order to improve teaching and learning process. These variables, however, have their own set of constraints. To begin, infrastructure such as the internet and electronic devices such as a tablet, computer, or laptop. Digital leadership is heavily reliant on technology, and certain basic requirements must be met in order for it to be implemented successfully. For example, every school should have internet access and electronic devices for teachers and students, or at the very least give shared electronic devices for students. Second, administrators' and teachers' attitude toward this leadership style provide a significant problem. As digital leadership has been one of the leading leadership style, it is crucial and beneficial for administrators, school leaders and teachers to have sufficient general knowledge and exposure to this leadership style. Administrators and teachers who hold unfavourable attitudes toward digital leadership and refuse to adapt to this new leadership style will make it a failure. Therefore, administrators and teachers must be adaptable and open-minded when confronted with a new leadership style. It would be beneficial to have a positive attitude when practising digital leadership at school. The digital leadership will help in the improvement of the educational environment pertaining to the most effective teaching and learning methods that are compatible with the Covid-19 pandemic. It is because most countries are moving toward e-learning, which is best suited to digital leadership. In terms of contribution to the literarure, the present study provides new variables for researchers who are interested in measuring digital leadership among teachers. As a way forward, this study would suggests to conduct an in-depth study on identifying subconstructs for these ten variables. It is also recommended to do conduct a research on the level of digital leadership among teachers as it can help stakeholders to plan training needed by teachers.

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