

The Relationship Between Teacher Readiness in Terms of Knowledge, Literacy and Attitudes Towards Digital Transformation

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Abstract

The abrupt shift in teaching and learning methods from physical classes to online classes has created a new norm for teachers and students and has had an impact on them, particularly teachers especially in post pandemic era. The primary purpose of this study is to determine the level of readiness in terms of knowledge, literacy, and teacher attitudes toward digital transformation in education. The survey method was used in this study to determine the relationship between the independent variable, digital transformation in education, and the dependent variable, level of readiness in terms of knowledge, literacy, and teacher attitude. In this study, 377 rural primary school teachers from the state of Johor were asked to complete a questionnaire. Overall, the study's findings revealed a moderately high level of readiness in terms of knowledge, literacy and teacher's attitudes toward digital transformation in education. As an outcome of this research, teachers and educators should seize the opportunity to prepare themselves and their students in various aspects of digital transformation in order to further strengthen Malaysia's education system. This is also supporting the SDG targets 4.3 and 4.4 within the context of Asia-Pacific and under the overarching theme of "Transforming Learning: Meeting the skills demand to achieve the SDGs in the Asia-Pacific".

1. Introduction

Based on the Quacquarelli Symonds (QS) World University Rankings 2022 Report, the best local university, the University of Malaya, is still ranked 65th in the world, while our smaller neighbouring country, the National University of Singapore, is ranked 11th. This demonstrates the need for Malaysia's education system to be strengthened in order to produce people who are knowledgeable and comparable to those in other countries (Samian and Awang, 2017). Our country has recently been shaken by the spread of a pandemic that has claimed many humans' lives, known as Covid-19. This has indirectly shifted the traditional teaching and learning process away from physical classrooms and toward online learning and facilitation.

As we face the new reality of a rapidly changing and developing world, the digital transformation in education has an impact not only on students, but also on teachers. Teachers continue to educate as usual, but they must work even harder to adapt to the online learning and facilitation process introduced by the Malaysian Ministry of Education (MoE) during this pandemic. Since online teaching and learning methods have been emphasised recently, most teachers face challenges in transitioning from traditional approaches to the application of digital transformation in learning and facilitation (Ali & Anwar, 2021). Problems encountered by teachers during teaching and facilitation during the new norm can have serious consequences if not addressed promptly. Faced with the reality of a lack of knowledge in the use of information and communication technology (ICT), these teachers have struggled to carry out the learning and facilitation process relevant to the requirements of the current educational system. Next, the difficulty in establishing communication between teachers and students contributes to the teacher's lack of mastery of the digital transformation of education that is taking place. Forced transition without planning to an online learning environment that altered the dynamic between students and teachers (Graham and Sahlberg, 2020). At the same time, teachers were unable to succeed in the learning and facilitation process due to a lack of skills in the use of information and communication technology (ICT) as well as unstable internet network access.

Not only that, the aspects of accepting changes in the education system in terms of the use of information and communication technology (ICT), such as the use of new platforms and software, have an impact on the learning and facilitation process. This is due to teachers' perceptions that they will face a greater burden in learning a digital-assisted learning approach. Due to a lack of online teaching experiences (Bao, 2020), concerns about the efficacy of online assessment and evolution, a lack of technological infrastructure in homes, a lack of interaction, and an expensive and insufficient Internet connection, the overwhelming majority of professors faced challenges with e-learning. Finally, a lack of support from the primary stakeholders, namely students, has an impact on teachers' readiness for digital transformation in education. Although having a positive and encouraging attitude toward online education, several teachers believed that conventional instruction would be a better fit for their students due to insufficient preparation and lower effectiveness in virtual learning environments (Sareen and Nangia, 2020). All of the challenges listed above indicate that this issue can be divided into three major aspects: knowledge, literacy, and attitudes of teachers toward digital transformation in education. This study tends to find the level of teacher readiness from the aspect of knowledge, literacy and attitude towards digital transformation in education. Besides, this study also measures the level of teacher readiness from the aspect of knowledge, literacy and attitudes towards digital transformation in education based on gender.

1.1 Digital Transformation in Education

Because people are required to practise social distancing, most social activities have begun to shift online (Chen, Lerman, & Ferrara, 2020). Learning sessions at educational institutions, on the other hand, are shifting from face-to-face to online at their respective residences. According to Mat Dawi, Theam, Palaniandy, and Dolah (2016), implementing technology-centered and online learning is an initiative to allow students to continue their studies without disruptions. Online learning is a type of learning that incorporates Information and Communication Technology (ICT) such as laptops, mobile phones, the internet, and other devices, with two types of environments involved, synchronous and asynchronous (Dhawan, 2020). As a result, in order to make the learning session a success during the pandemic, the government took steps to transform the national education system into a technology-based education system, introducing applications such as Google Meet, Zoom, Webex, Microsoft Team WhatsApp, Telegram, Canva, Blackboard, and other software such as interactive quiz-based digital learning (Musa and Abdillah, 2021).

Using online learning platforms is a suitable approach to raise the standard of instruction, especially in the current industry 4.0 era (Nawi & Hamidaton, 2020). During the current crisis, online education can serve as a catalyst for this kind of change, especially by allowing the field to grow and establish itself as a reliable source of learning material (Jamidi & Surat, 2021).

1.2 Teacher Readiness in Knowledge, Literacy and Attitude

Research from Faloon (2020) emphasizes the significance of this in light of their future roles as teachers, training youth to develop the ability to take advantage of digital resources and information in sustainable, safe, and effective ways. A broadly-based framework for teacher digital competency is presented to help with this, and teacher educators have a crucial role to play in putting it into practice through intentional planning, modeling, and instruction. According to Bakke, Steinvik, Angell, and Wisborg (2017), readiness is a process that involves the integration of emotional aspects, thinking, and physicality in carrying out something. Typically, this teacher's willingness is linked to the teacher's acceptance of a change or reform pattern. Preparedness in the teacher's teaching session assists teachers in engaging students in the teaching and learning process. Due to the Covid-19 pandemic, a drastic shift in learning from face-to-face to online at home respective residences has surprised both teachers and students. According to Abdul Aziz, Soffian Lee, and Yusof (2021), the emergence of new norms in the

learning process necessitates teachers adapting as quickly as possible to ensure that the learning and facilitation process is not impacted.

1.2.1 Knowledge

The teaching of an effective teacher is founded on mastery of content knowledge and pedagogy. Mastery of content knowledge refers to the teacher's understanding of concepts and methods for the discipline or field specific knowledge, whereas pedagogical content knowledge is a combination of content and pedagogy to form one understanding of how a specific topic, problem, or issue is structured, represented, and adapted to various interests and abilities among students and presented in the form of teaching (Lau, 2017). This statement is consistent with the viewpoint of Fadilla and Zamri (2019), who believe that teachers must have extensive knowledge of the approach or diverse teaching before being applied in learning and student facilitation, as well as confidence and understanding in delivery teaching, in order for the learning process to go as planned.

Zamri and Magdelline (2017) believe that teachers who are highly knowledgeable in mastering the teaching content find it easier to prepare and plan more effective lessons for their students. Meanwhile Faloon (2020) stated that the competency of a teacher encompasses a variety of skills, such as project and inquiry-based learning designs, critical evaluation and selection of various technologies and applications as "fit for purpose," compatibility of digital resources with subject and problem, and knowledge of efficient class group and resource access systems.

1.2.2 Literacy

A variety of programmes that require literacy mastery and teacher skills in the field of information and communication technology (ICT) should be the primary driving force for all parties involved in creating qualified teachers capable of educating and developing society and country. The learning and facilitation process that is now digitally assisted and more creative and innovative is an attraction to attract students' attention to the subjects being taught when compared to teaching in general as it was previously (Noorhadi and Zurinah, 2018). As a result, teachers should be prepared with mastery in digitally assisted educational skills in line with the current digital transformation of education.

Due to the critical role that digital literacy plays in education, it is imperative that all teachers receive ongoing training (Vidosavljević & Vidosavljević, 2019).

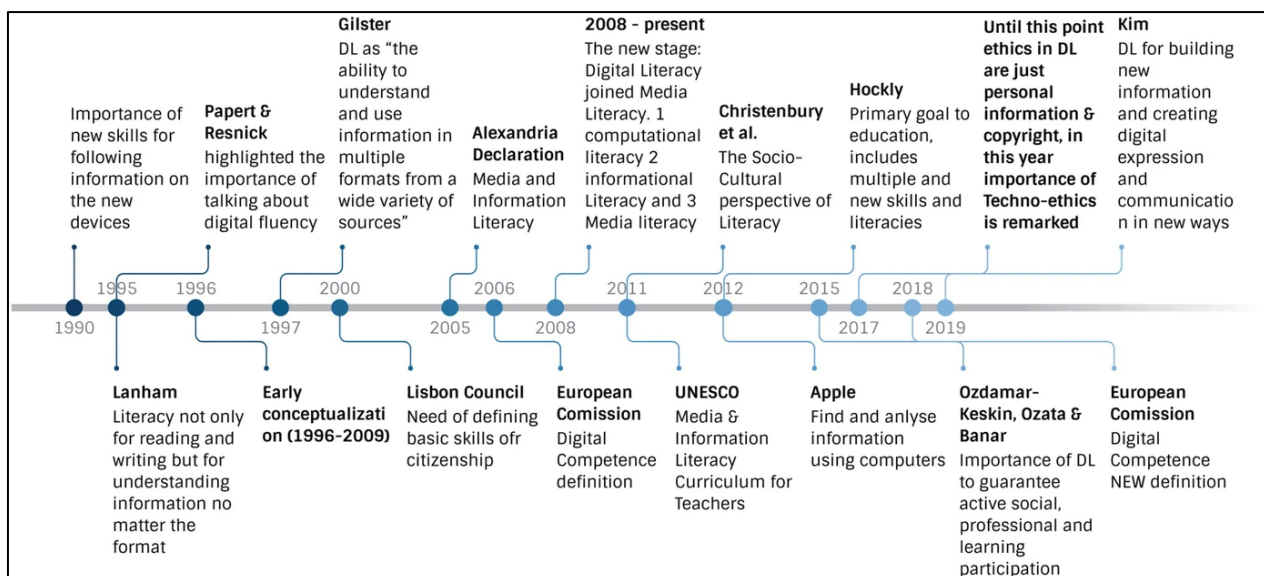


Fig. 1 Timeline for the conceptualization of digital literacy

A number of reviews (Avello Martínez et al., 2013; Canchola-Gonzalez & Glasserman Morales, 2020; Gibson & Smith, 2018; Manca et al., 2021; Perdomo et al., 2020; Reddy et al., 2020; Reis et al., 2019) provided information that was used to create Figure 1. Digital literacy is widely used in institutional settings and is taught in some countries' curricula, such as Indonesia and New Zealand (Canchola-Gonzalez & Glasserman Morales, 2020). The concept of digital fluency provided by Christian Briggs and Kevin Makice in their 2012 book is the most often referenced definition in the specialized literature. The capacity to consistently accomplish goals using digital

technology is referred to in this definition, "not only knows what to do with a technology and how to do it but also when and why to use it."

In order to develop digital competence in teacher education, Howard et al. (2021) propose an integrated approach that incorporates six teaching strategies: (1) teacher educators as role models; (2) opportunities for reflection; (3) learning by design; (4) collaboration; (5) authentic experiences; and (6) providing feedback. The possibility exists that teachers will challenge current thinking and potentially become "change agents" towards a more inclusive and modern understanding of teacher digital competence if they are encouraged to consider an expanded view of the subject that goes beyond the current emphasis on didactic application and technically-oriented digital literacy-building before entering the classroom.

1.2.3 Attitude

The attitude of the teacher is also important in determining a positive attitude toward the acceptance and use of digital transformation in the learning process and facilitation. Teachers' motivation and enthusiasm must also be maintained and nurtured in order for them to continue educating students and overcome the problems or constraints encountered during the implementation of learning and facilitation. According to a number of research (e.g., Aslan & Zhu, 2017; Scherer et al., 2018), pre-service teachers typically have positive attitudes about digital technologies.

To develop quality national education, the digital transformation brought to the world of education necessitates a teacher's positive attitude toward changes. This statement is supported by Duman, Taat, and Abdullah (2021), who stated that the implications of educational reform are dependent on teachers' attitudes, because they are the primary agents of change that want to be implemented in a society organisation of education. In fact, the previously mentioned aspects of knowledge, literacy, and attitudes can influence a teacher's level of readiness for digital transformation in education. Teachers should always consider these aspects and prepare in the process of developing the L&ST method as a learning platform that not only facilitates parties educators and students but also changes the students' perception of digital transformation in education. Digital transformation is no longer an option; rather, it is a requirement in educational institutions in the post-industrial and increasingly challenging post-globalization era.

2. Methodology

This study completely uses a quantitative approach. The research design used in this approach is a survey method. This method is implemented through data collection using a questionnaire. This study also employs a descriptive and inferential approach in order to collect knowledge about the study's objectives while attempting to avoid any factors that may change the study's objectives. This study included 377 rural primary school teachers between the ages of 25 and 55 from the state of Johor as participants. To meet a total sample of 377 people, a random sample of 906 primary schools in the state of Johor was chosen. Simple randomization was performed by listing 578 rural schools in the state of Johor. Prior to the final draw, the number of teachers from each primary school who will be used as respondents will be determined. As a result, it is estimated that 15 to 18 schools were chosen at random in order to meet the sample size of 377 people.

To obtain data for this study, a questionnaire-like instrument called Google Form is used. Questionnaires are more appropriate because they are easier to obtain cooperation from respondents and can be used in survey research (Zulkifli, Hamzah, and Razak, 2020). This questionnaire is divided into two sections: (a) respondent demographics and (b) teacher readiness in terms of knowledge, literacy, and attitude toward digital transformation of education. This questionnaire contains 24 objective form question items. The Likert scale used to score part B for this study is a 5-point scale. Part A includes 4 questions items while Part B includes 21 questions items that cover three aspects: the teachers' level of readiness in terms of knowledge, literacy, and attitude.

3. Findings and Discussion

Data analysis is performed to make the data obtained more understandable and to present it in a more concise format (Creswell & Creswell, 2017). Data analysis and decisions are made in accordance with the study's scope. This study's data was analysed using descriptive and inferential analysis. Descriptive findings, such as mean, standard deviation, percentage, and frequency, were used to explain the demographics of respondents and their level of readiness in terms of knowledge, literacy, and attitude toward digital transformation in education.

3.1 Respondents Background

According to the Table 1, there were 178 male respondents (47.2%) and 199 female respondents (52.8%). Furthermore, the age of respondents in this study is divided into six categories, as shown. Respondents are rural primary school teachers in Johor who are between the ages of 25 and 30 are 67 people (17.8%), respondents between the ages of 36 and 40 are 93 people (24.7%), respondents between the ages of 41 and 45 are 95 people

(25.2%), respondents between the ages of 46 and 50 are 58 people (15.4%), and respondents between the ages of 51 and 55 are only 14 people (3.7%). This means that half of the respondents in this study are between the ages of 36 and 45, while the least respondent was between the ages of 51 and 55. In addition, 42 people (11.1%) are still single, with the remaining 325 people (86.2%) married and 10 people (2.7%) in other statuses. This demonstrates that the majority of respondents in this study are married.

Table 1 Gender, age and marital status

Indicator	Frequency	Percentage
<i>Gender</i>	377	100.0
Male	178	47.2
Female	199	52.8
<i>Age</i>	377	100.0
25 to 30 years old	67	17.8
31 to 35 years old	50	13.3
36 to 40 years old	93	24.7
41 to 45 years old	95	25.2
46 to 50 years old	58	15.4
51 to 55 years old	14	3.7
<i>Marital Status</i>	377	100.0
Single	42	11.1
Married	325	86.2
Others	10	2.7

3.2 Teachers' Readiness

The variable examined in this research is the extent to which teachers are prepared to face digital transformation in the field of education in terms of knowledge, literacy, and attitudes. This can be evaluated using the mean score obtained from the research, as shown in Table 2.

Table 2 Mean value of teacher readiness

Aspect	Mean (N=377)	S.D	Interpretation
Knowledge	3.45	0.432	Medium High
Literacy	3.48	0.462	Medium High
Attitudes	3.72	0.371	Medium High
Average value (Teacher Readiness)	3.55	0.422	Medium High

(Level: Low = 1.00 – 2.00, Medium Low= 2.01 – 3.00, Medium High= 3.01 – 4.00, High=4.01-5.00).

Based on the analysis, it was found that all three aspects of teacher readiness were at the medium high level. Aspects presented in the study should be thoroughly researched, and teachers should be under obligation to increase their level of knowledge, literacy, and attitude toward digital transformation in education. Based on the findings, researchers can predict changes in attitudes and readiness among primary school teachers rural types in the state of Johor are at moderately high levels. Positive attitude teachers play a significant role in educational change, including digital transformation is taking place in the field of education. This statement similar with study by Idris and Tan (2018) who say the present-day situation is the new reality of a fast-changing and evolving world in line with the world of education, every teacher demands that it be positive in use of technology as part of teaching tools.

The results of this study were supported by qualitative studies of Kamarudin et al.,(2022) who stated that the method of use of multimedia inside classes by teachers are easier to understand by students and attract students for more interested in the subject. In line with the findings by Abu Hassan et al, (2021) that said that students' attitudes were also more positive towards learning teaching using technology.

Al-Awidi and Aldhafeeri (2017), who received results from the study that teachers are prepared at a moderate level to implement the digital curriculum and identify which factors outweigh their preparedness, are also in favor

of the moderate attitude of the primary school external types teachers in the city in Johor state. This is because of time constraints, motivation, and technical support. The literacy and skills of the teacher are the most important thing is to ensure quality education delivered to students to be able to develop generations skilled, noble and knowledgeable in using or applying any effective approach. The variety of applications that can be used to help online learning has become a platform to replace teaching and face-to-face learning. In this era of globalization, the use of multimedia and communications technology is a necessity it is very important in all matters in the field of education not only in the past pandemic but for future. This statement is consistent with the study. Aloysius et al (2019); Hosseini et al., (2019) also noted digital-based learning or technology has received significant attention in educational pedagogy as effective ways to improve motivation and student engagement within classes.

There are also many past studies prove the effectiveness of teachers who are positive in practice technology-assisted skills for students such as studies at university level (Alyaz & Genc 2016; Fotaris and Mastoras, 2019), high school studies which also supports a teacher preparing in skills multimedia and communication technologies and apply in learning classroom, it will influence as well as improve student motivation during the process learning and facilitating.

3.3 The Differences of Teacher Readiness Based on Gender

The T-test results in Table 3 show a difference in the level of readiness for male and female teachers in terms of knowledge, literacy, and attitude toward digital transformation in education. According to the findings of the study, female teachers are more prepared for all three aspects than male teachers.

Table 3 *T-test differences in teacher readiness based on gender*

Aspect	Gender	N	Min	T Value	df	Sig
Knowledge	Male	178	3.34	-4.627	375	0.002
	Female	199	3.54			
Literacy	Male	178	3.40	-3.384	375	0.001
	Female	199	3.56			
Attitude	Male	178	3.63	-4.345	375	0.003
	Female	199	3.79			

The study's findings revealed that the t-value for the average comparison of the level of readiness from the standpoint of knowledge is $t = 4.627$, with a level of significance of $p = 0.002$. While for the aspect of literacy it is $t = 3.384$ and the significance level is $p = 0.001$. The attitude factor has a $t = 4.345$ and a significance level of $p = 0.003$. Furthermore, Table 4 below shows the average value of t-test from the three aspects, namely knowledge, literacy, and attitude, based on gender. The level significance determined by the results of this test is less than $0.05 (p < 0.05)$. As a result, there is a significant difference in the level of readiness in aspects of knowledge, literacy, and attitude between male and female rural primary school teachers in the state of Johor.

The result support by Munzir (2020) which stated that female lecturers and male lecturers have different levels of preparedness related approach Learning Management System (LMS) as one steps in expanding the digital transformation of education. The findings of this study also similar to a study by Ermertah (2018) which stated that female teachers have more knowledge in the implementation of teaching in English compared to male teachers. However, the findings of this study are contrary to results of a study by Ghafar and Mahamod(2020) found that the teacher male and female teachers of Malay use and apply their curricular skills are good when learning and facilitating is conducted in the classroom. A string of realities is confronted with last pandemic wave, we could see a paradigm shift in all sectors especially the national education sector particularly in adapting sessions learning and facilitation new norms that rely heavily digital transformation among teachers, students and all parties involved in educational institutions.

4. Conclusion

This study successfully demonstrated that teachers' preparedness in terms of knowledge, literacy, and attitudes toward digital transformation in education is moderately high, with a significant gender differences. However, after extensive research and study, it was not possible to deny that the digital transformation in education is actually accelerating, bringing with it its own set of benefits and drawbacks, particularly for teachers and students. Aspects presented in the study should be thoroughly researched, and teachers should be under obligation to increase their level of knowledge, literacy, and attitude toward digital transformation in education. Several recommendations were made for the Malaysian government, Malaysian Ministry of Education (MoE), school administration, teachers, and students regarding the level of teacher readiness in terms of knowledge, literacy, and attitude toward digital transformation in education. The MoE and school administrators should always be aware of teachers' mastery in terms of knowledge, literacy, attitude, and so on. Teacher training and in-service

training programme that apply the characteristics of innovation and digital transformation should be provided in a practical and comprehensive manner so that Malaysian teachers can meet the criteria of current education pedagogy that is relevant to today's era. Administrators, technology experts, and more skilled teachers can also work together to provide regular guidance to teachers who are inefficient in their use of multimedia and communication technology (ICT).

The government must also reduce the digital divide by providing infrastructure services such as a reliable telecommunications network so that all parties can benefit from the facility. Cooperation between students and teachers is also effective in the environment of digital transformation in the classroom, which is required so that not only the teacher's potential but also the potential of the students can be developed. Finally, future researchers should employ a combination of qualitative and quantitative methods. Future studies will be more useful if they can combine qualitative methods to obtain more in-depth information about teachers' perceptions of digital transformation in today's educational world. In a nutshell, the digital transformation of education allows people to improve their skills and academic qualification milestones to become more concrete. The implementation of this transformation is also the beginning of students' minds broadening. Students will also be more exposed to the world of globalization if the digital transformation in education is implemented comprehensively, as the new millennium is bound to be loaded with reformation challenges.

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Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

*The authors confirm contribution to the paper as follows: **study conception and design:** Alazam and Wan Muda; **data collection:** Alazam; **analysis and interpretation of results:** Ab Halim and Ismail; **draft manuscript preparation:** Alazam, Wan Muda, Isa and Saifuddin. All authors reviewed the results and approved the final version of the manuscript.*

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