

History Teachers Knowledge in Implementing Digital Learning Towards the Implementation of Historical Thinking Skills

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ABSTRACT

The use of digital learning applications in the teaching and learning process is a pedagogical approach that should be mastered by History teachers today, especially in training Historical Thinking Skills. Technological advances have encouraged teachers and students to utilize various digital learning applications to improve teaching and learning. Failure to integrate the latest digital learning applications can cause students' interest in the subject of History to decrease. Therefore, this study was conducted to identify the knowledge of History teachers in applying digital learning technology to the implementation of Historical Thinking Skills in the teaching and learning of History. Historical Thinking Skills are one of the historical disciplines that need to be implemented by History teachers in the teaching and learning of History. There are five elements, namely understanding chronology, exploring evidence, making interpretations, creating imagination and making rationalizations contained in Historical Thinking Skills. This study used a qualitative method involving three study participants, consisting of secondary school History teachers in the Seberang Perai Tengah district, Penang state. Data was obtained through interviews. The results of this study show that History teachers have good knowledge in applying digital learning technology to the implementation of Historical Thinking Skills in the teaching and learning of History. This shows that History teachers have applied digital learning technology effectively, especially in the implementation of Historical Thinking Skills. This study also has the potential to be used as a reference for further research that examines the same issue from the perspective of teachers in primary schools in an effort to strengthen the use of information and communication technology in line with the development of the 4.0 Industrial Revolution. It is hoped that these findings can be used as a guide especially for History teachers, schools, policymakers, the Ministry of Education Malaysia, State Education Departments, Malaysian Teacher Education Institutions and universities.

Keywords: Knowledge, Digital Learning Applications, Historical Thinking Skills, Teaching and Learning

INTRODUCTION

21st century education demands the meaningful integration of digital technology in the classroom, in line with national policy aspirations such as the Digital Education Policy of the Ministry of Education Malaysia which outlines the thrust, strategies and initiatives to bridge the digital divide and empower technology-based teaching and learning practices in schools (KPM, 2025). In the context of History Education, the global emphasis on Historical Thinking Skills is increasingly focused on the extent to which teachers can integrate modern digital learning technologies such as generative video platforms and interactive digital resources into History teaching to strengthen the implementation of KPS such as understanding chronology, exploring evidence, making interpretations, creating imagination and making rationalizations. Recent studies using the TPACK and TMK frameworks emphasize that teachers' knowledge and readiness in this technology play an important role in facilitating more interesting and effective teaching and learning (Counsell, C., et al., 2025).

At the same time, the effectiveness of technology application in teaching and learning depends largely on teacher knowledge based on the Technological Pedagogical Content Knowledge (TPACK) framework providing a conceptual basis for how teachers integrate content knowledge, pedagogy and technology holistically, while the SAMR model provides an operational lens for assessing the level of transformation of teaching and learning practices through technology (Harris, J., et al., 2024). Recent empirical evidence shows

that the use of digital tools can improve academic achievement, engagement and critical thinking of students specifically in History, interventions based on learning analytics and collaborative platforms such as Padlet are reported to support the development of Historical Thinking Skills and students' self-efficacy (Gómez-Trigueros, I.M., et al., 2024).

However, implementation gaps remain, including issues of equity of access and digital literacy, which have implications for teachers' competence and readiness to effectively apply technology in History subjects in Malaysia, even as national infrastructure such as DELIMa continues to be strengthened (Ling, S., et al., 2023). Therefore, this article focuses on History teachers' knowledge in applying digital learning to the implementation of Historical Thinking Skills, with the aim of contributing local contextual evidence that can provide new information regarding teachers' knowledge in applying digital learning to the implementation of Historical Thinking Skills in the teaching and learning of history.

Problem Statement

Although Digital Education policies have been strengthened at the global and national levels, the reality on the ground shows several major challenges that limit the effectiveness of integrating digital technologies in History teaching. Previous studies have shown that teachers still face challenges in selecting and integrating digital technologies in their teaching. In many cases, teachers' use of technology is more superficial and functions as an additional tool, without being directly linked to constructive and meaningful teaching strategies (Djoubi, 2023). This situation illustrates that there is a gap between technical skills and pedagogical understanding, where teachers tend to apply technology ad hoc without planning learning activities that can encourage critical thinking, inquiry, and student collaboration.

This is in line with the findings of Tondeur et al. (2017) who emphasized that effective technology integration requires a conceptual understanding of the relationship between content, pedagogy and technology, as described in the Technological Pedagogical Content Knowledge (TPACK) framework. Lack of mastery of this aspect causes the use of technology to not have an optimal impact on the effectiveness of the history learning process. In the Malaysian context, the implementation of Historical Thinking Skills based on digital technology still faces various significant constraints. Studies show that the level of teacher readiness is still low, especially in terms of mastery of digital pedagogical skills and the limited use of technological infrastructure in schools (Rosyidah & Hashim, 2022). In addition, the tendency of teachers to maintain traditional teacher-centered teaching approaches causes less emphasis on history learning innovations (Ariffin & Yusof, 2021). Furthermore, the absence of specific training that supports the integration of technology in the teaching and learning of History constrains teachers' ability to apply inquiry-based approaches and analysis of digital sources (Husin et al., 2023). These factors directly limit the effectiveness of efforts to strengthen Historical Thinking Skills among students through the use of digital methods.

There is still a lack of empirical studies that holistically investigate the level of knowledge and attitudes of History teachers towards the use of digital learning technologies in strengthening Historical Thinking Skills. Therefore, this article aims to fill this gap by systematically investigating the knowledge of History teachers in this context, and then formulate recommendations for improving professionalism based on empirical evidence. Online applications such as Google Meet, Jamboard, Google Classroom and Zoom create an interactive and conducive teaching and learning environment for students. The use of these applications can be expanded to stimulate creative thinking among students. However, teachers experience difficulties and constraints in integrating online applications due to lack of knowledge and skills in using the internet network and conducting online teaching (Siti Nurbaizura & Nurfaradilla, 2020).

Objectives of the Study

The objectives of this study are: To identify the knowledge of History teachers in applying digital learning technology towards the implementation of Historical Thinking Skills in the teaching and learning of history.

Research Questions

The research question is:

To what extent do History teachers have knowledge in applying digital learning technology towards the implementation of Historical Thinking Skills in the teaching and learning of History?

Significance of the Study

The results of this study are expected to provide information about the knowledge of History teachers in applying digital learning technology to the implementation of Historical Thinking Skills in the teaching and learning of History. The information from this study is expected to help in realizing the goals of the Malaysian Education Development Plan (PPPM, 2013-2025) which emphasizes the importance of historical thinking skills. The findings of this study are also expected to help realize the goals of History education which aims to produce a new generation that has high thinking, morals and is able to overcome future challenges (PPPM, 2013-2025, KPM, 2012). To achieve this goal, it is very important that the teaching and learning of History subjects need to emphasize historical thinking skills based on the discipline of History.

This study is also expected to help teachers in improving teacher competence, especially knowledge of applying digital learning technology to implement Historical Thinking Skills in the teaching and learning of History. In addition, the results of this study are expected to provide information about teachers' knowledge in applying the latest digital learning technology to the implementation of Historical Thinking Skills in the teaching and learning of History to produce students who are historically minded and therefore have the skills to think systematically. In addition, this study will help teachers in preparing, planning and creating an interactive learning environment in delivering the five categories of Historical Thinking Skills effectively. This is because Historical Thinking Skills through KSSM in the teaching and learning of History is something new among History teachers, its introduction began in 2017.

The findings of this study are also hoped to be used as a source of information for school management and administration, District and State Education Departments, as well as the Curriculum Development Center and its Ministry to plan and implement any changes or reforms in the History curriculum in line with the intention of the Secondary School Standard Curriculum to produce students who master the knowledge of Malaysian and world history by encouraging the cultivation of thinking skills in ensuring that the country's educational aspirations can be achieved (KPM, 2013, PPK, 2003; 2015, Said Hamid Hasan, 2019).

LITERATURE REVIEW

The development of digital learning in 21st century education has transformed the pedagogical landscape from traditional approaches to more flexible, interactive and student-centered learning. Conceptually, digital learning is not simply the use of technology, but involves a transformation of instructional design that supports active knowledge construction through access to diverse resources and collaborative interactions (Bond et al., 2020). However, recent literature shows that the effectiveness of digital learning is not automatic, but rather highly dependent on the ability of teachers to design meaningful learning experiences (Bao, 2020). This suggests that technology functions as a catalyst, not the primary determinant of learning outcomes.

In the context of History Education, the need to integrate digital learning becomes more significant due to the nature of this discipline that demands higher-order thinking skills, particularly Historical Thinking Skills such as source analysis, interpretation and rationalization (Wineburg, 2001; Seixas & Morton, 2013). However, a synthesis of past studies shows that there is a mismatch between curriculum aspirations and actual teacher practice. Local studies consistently report that the implementation of Historical Thinking Skills is still at a moderate level and is often limited to content-oriented and examination-based approaches (Abdul Razaq & Mohd Johdi, 2019; Mohd Mahzan et al., 2016).

Constraints such as workload, lack of time, and access to authentic historical sources continue to be major barriers (Mohamad Johdi & Ariegusrini, 2018; Rosy Talin, 2020). When digital learning is introduced as a

pedagogical intervention, a critical question arises: to what extent does technology truly support the development of Historical Thinking Skills? International literature suggests that effective technology integration requires a balance between content knowledge, pedagogy, and technology as described in the Technological Pedagogical Content Knowledge (TPACK) framework (Koehler et al., 2019; Chai, 2020). However, critical analysis of recent studies shows that most TPACK research still focuses on measuring teachers' knowledge levels in general, without linking it in depth to specific pedagogical practices in a particular discipline such as History (Willermark, 2021; Schmid et al., 2021).

This creates a gap between theoretical constructs and the reality of classroom implementation. Furthermore, although educational policies such as the Malaysian Education Blueprint and digital initiatives such as DELIMA 2.0 have increased access to technology, the literature shows that the main issue is no longer access, but the pedagogical capacity of teachers to operate technology meaningfully (Voogt et al., 2015; Tondeur et al., 2017). In History Education, this challenge becomes more complex as teachers need to adapt technology not just for the delivery of information, but to support interpretive and reflective historical reasoning processes. Studies show that many teachers still use technology at a surface level (substitution), without reaching a level of pedagogical transformation that supports critical thinking (Chai et al., 2019).

From a teacher knowledge perspective, previous studies have shown that digital literacy is an important prerequisite for effective technology integration (Ghavifekr & Rosdy, 2015). However, a synthesis of findings shows that this knowledge is often general and not contextual to the needs of the discipline. For example, teachers may be skilled in using digital applications, but less able to design assignments that support the analysis of historical sources or the construction of evidence-based arguments (Ngah & Jusoh, 2021). This indicates the existence of a gap between technological knowledge and disciplinary pedagogical knowledge.

Overall, the literature analysis reveals three main gaps. First, there is a lack of empirical research that explores in depth how History teachers understand and operationalize digital learning in the context of implementing Historical Thinking Skills, particularly at the level of actual classroom practice. Second, the limitations of existing research that connects theoretical frameworks such as TPACK with specific applications in History Education, resulting in a lack of understanding of how technology can authentically support the dimensions of historical thinking. Third, most studies use quantitative approaches or large-scale surveys, which tend to ignore the nuances of teachers' experiences and local contexts.

STUDY METHODOLOGY

This study uses a qualitative approach with a pilot exploratory case study design to explore in depth the knowledge of History teachers in applying digital learning towards the implementation of Historical Thinking Skills. This design was chosen because studies related to the integration of digital learning in the context of Historical Thinking Skills are still limited, especially in the context of teachers' actual practice in the classroom, thus requiring an initial exploration that is contextual and in-depth (Yin, 2018; Merriam & Tisdell, 2016).

Data were collected through semi-structured interviews as the main instrument. This method allowed the researcher to obtain rich, flexible and responsive data on the participants' experiences and meanings of their pedagogical practices (Creswell & Poth, 2018). Interview questions were constructed in a guided but open-ended manner to provide space for participants to describe their experiences, challenges and strategies reflectively.

The study participants consisted of three History teachers from three secondary schools in the Seberang Perai Tengah district, Penang, who were selected through purposive sampling techniques. This selection was based on specific criteria, namely experience teaching History and involvement in the use of digital elements in teaching. Although the sample size was small, it was in line with the principle of qualitative case studies that emphasize depth of data over breadth of sample (Patton, 2015).

This limited sample size can also be justified through several methodological considerations. First, this study is an initial exploratory study that aims to understand the phenomenon in depth before a larger-scale study is conducted. Second, in case studies, the main focus is on the richness of data and contextual understanding, not

statistical generalization (Yin, 2018). Third, the selection of participants who are homogeneous in terms of teaching context allows for a more focused and in-depth analysis of the phenomenon under study. This approach is also in line with the concept of “information-rich cases” recommended in qualitative research (Patton, 2015).

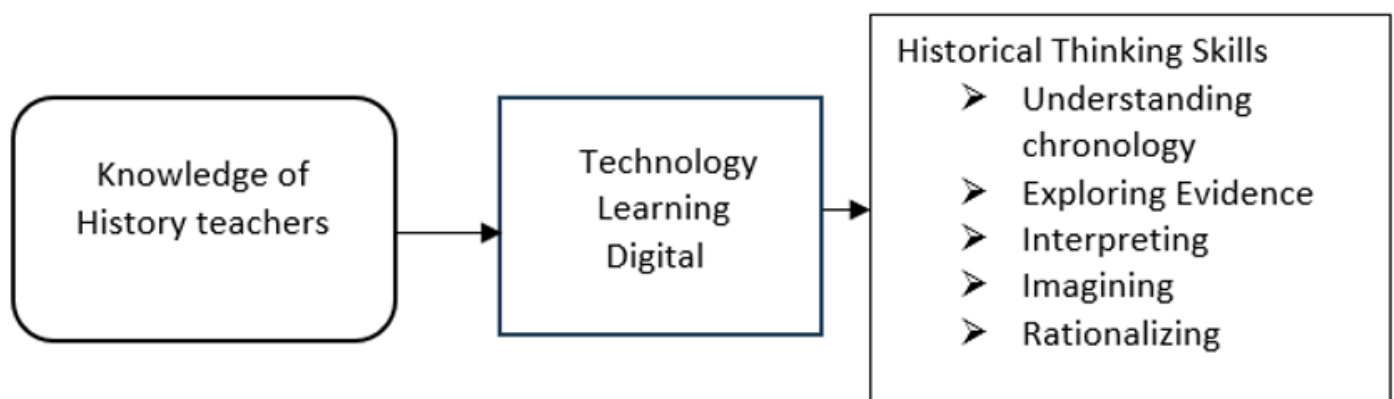
Data were analyzed using thematic analysis which involves the process of coding, categorization and systematic theme development. This analysis allows the researcher to identify patterns, meanings and relationships between knowledge constructs, attitudes and practices in the implementation of Historical Thinking Skills based on digital learning. To increase the validity and reliability of the findings, steps such as peer debriefing and participant verification (member checking) can be implemented (Lincoln & Guba, 1985).

Overall, the selection of this methodology is appropriate for the purpose of the study which emphasizes in-depth exploration of complex phenomena in real contexts, in addition to providing an empirical basis for the development of broader further studies in the future.

FINDINGS AND DISCUSSION

This section presents the findings of the study which aims to achieve the objective of identifying the knowledge of History teachers in applying digital learning for the implementation of Historical Thinking Skills in the teaching and learning of History. For reference purposes and to facilitate discussion, the study participants were given identification codes, namely PK1 for participant 1, PK2 for participant 2, and PK3 for study participant 3. A summary of the study findings is shown in Figure 1.

Figure 1 History teachers' knowledge in applying digital learning technology towards the implementation of Historical Thinking Skills in teaching and learning History



Data collection for this study was carried out through structured interviews with study participants, where interview questions were pre-determined and content validity was confirmed by three field experts. During the interview session, the researcher recorded the participants' responses regarding teachers' knowledge in applying digital learning technology for the implementation of Historical Thinking Skills in the teaching and learning of History. The analysis findings showed that study participants had a good level of knowledge on the implementation of Historical Thinking Skills with the use of digital learning technology.

To what extent do History teachers have knowledge in applying digital learning towards the implementation of Historical Thinking Skills in the teaching and learning of History?

Based on interview data from study participants (PK) PK1, PK2 and PK3 regarding teachers' knowledge in applying digital learning technology towards implementing Historical Thinking Skills in teaching and learning is as follows:

"I use digital applications such as Google Classroom and Padlet in teaching History. However, I admit that I am not yet fully proficient in integrating these technologies to stimulate Historical Thinking Skills..." (PK1;TB1;B17).

For PK2 study participants, they showed a deeper knowledge of digital learning technology, stating that they used Kahoot and Quizizz to assess students' understanding, as well as linking it to higher-order thinking activities. However, they emphasized that challenges arise when the internet is unstable (internet access issues), which disrupts the smooth implementation of Historical Thinking Skills.

"I often like to use digital learning applications like Kahoot and Quizizz

Because I can assess whether my students understand or not. But.. there are also problems if the internet is slow (PK2;TB1;B26).

Compared to study participant 3 who admitted that his knowledge was still limited, limited to the use of Power Point and YouTube. He rarely used interactive applications due to training constraints and was less skilled in this because he was rarely exposed to the use of technology with mastery of Historical Thinking Skills.

"Like me, this old teacher, I only use Power Point and YouTube because that's the easiest, if it's AI... I'm not good at AI and don't have time to learn anymore" (PK3;TB1;B34)

The study participants also stated that they use applications such as DeLIMa, Google Meet, Google Classroom, Telegram and WhatsApp with their students. This is because these applications create an interactive and conducive teaching and learning environment for the students.

"I often use the DeLIMa platform, I also use Google Classroom and Google Meet for my history classes" (PK1;TB2;B18)

Meanwhile, PK2 study participants also enjoyed using Google Classroom in teaching and learning History. They stated that:

"My students' assignments are given using Google Classroom. It's easy for my students to access and it's more interesting" (PK2;TB2;B26)

For the PK3 study participant, he prefers to use the Telegram and WhatsApp applications in his teaching. The interview results found that PK3 stated:

"When teaching history, I will use voice chat on Telegram as well, where we can share the screen if we want to show the screen, but...the most used is WhatsApp..." (PK3;TB2;B41)

Based on the interviews, the three study participants showed a good level of knowledge in applying digital learning technology to the implementation of Historical Thinking Skills in the teaching and learning of History. However, there are several challenges they face, including that the study participants are not yet fully skilled in integrating the technology to stimulate Historical Thinking Skills. In addition, the challenge of unstable internet access also disrupts the smooth implementation of Historical Thinking Skills in the teaching and learning of History. Not only that, the lack of training causes them to be less skilled in applying digital learning in implementing Historical Thinking Skills, this is because they are rarely exposed to how to use technology appropriately to implement Historical Thinking Skills.

Data were also collected through non-participant classroom observations to directly assess how teachers integrated digital technology in the implementation of Historical Thinking Skills. This method allowed the researcher to examine the alignment between the knowledge expressed by teachers and actual practices in History Teaching and Learning. Through classroom observations, the researcher found that the participants in the first study and the participants in the second study used Google Classroom to implement Historical Thinking Skills in the teaching and learning of History.

Document analysis was also conducted on Daily Lesson Plans, digital teaching aids and student assignments to assess the extent to which technological, pedagogical and content elements were systematically integrated into Teaching and Learning planning. The use of multiple data sources allowed for triangulation to be conducted to increase the validity of findings through cross-comparison between interview data, observations and documents.

Based on the analysis of the study participants' daily teaching plan documents, it was found that all study participants noted that teaching aids, namely the use of digital information technology, were included in the daily teaching plan. This is in line with the findings from the observations and interviews conducted with the study participants.

Overall, these findings indicate that all study participants have a relatively good and focused knowledge of the use of digital learning applications for the implementation of Historical Thinking Skills. However, teachers have challenges in applying them in the teaching and learning of History. All participants consistently emphasized that technology functions not only as a medium for delivering content, but as a pedagogical tool that stimulates the skills of questioning, analyzing evidence, and building arguments based on historical sources. This emphasis on the function of technology as a facilitator of active learning is in line with the assertion of previous studies that prove that the integration of technology in History Education has the potential to strengthen students' critical and analytical thinking practices through interaction with various digital resources (Wineburg, 2018; Ramírez & Gordón, 2019; Gómez-Carrasco, Monteagudo & Miralles, 2020). This indicates that the effectiveness of technology in History teaching should be understood from a broader pedagogical perspective, namely as an instrument that supports the achievement of historical thinking skills objectives in a meaningful way.

Various digital platforms such as Google Classroom, Padlet, Canva, Kahoot!, YouTube, and Google Earth were used strategically to encourage active student engagement and enable interactive and contextual delivery of information. The synthesis of findings showed that participants' awareness of the pedagogical functions of technology was high and they were able to relate the characteristics of digital tools to elements of Historical Thinking Skills in a planned manner. This proves that the integration of digital technology by History teachers has the potential to strengthen the evidence-based learning process, thereby improving the quality of History teaching and learning.

Digital Teaching Aids

The study participants also faced challenges in the aspect of preparing teaching materials to implement Historical Thinking Skills in teaching and learning. The preparation of teaching materials is an important responsibility of every teacher to ensure that the teaching process is more interesting and able to stimulate students' interest in the topics being studied. However, the PK1 and PK3 study participants stated that they faced difficulties especially in obtaining teaching materials based on information and communication technology, thus affecting the smooth integration of innovative pedagogy in the classroom.

My children are happiest when I use multimedia materials, such as videos from TikTok or YouTube. They really like it. (PK1;TB2;B43).

Unlike the PK2 and PK3 study participants, the challenges in preparing and using teaching aids stemmed from school policies that prioritized access to facilities, including the History Room and computer labs, for examination classes. This situation meant that only Form Five teachers had more opportunities to utilize these facilities than teachers in other grades.

"My school is fighting over whether to use the History room that has an LCD and internet" (PK2;TB2;B56).

"I had to buy the LCD myself because I only used it in class so I didn't have to fight with the Form 5 teacher" (PK3;TB2;B64).

PK3 study participants stated that they bought their own Liquid Crystal Display (LCD) to use in class. If they cannot access special rooms, they can still use technology-assisted teaching aids in class only. Although teachers have to buy the teaching aids themselves, they can use them at any time.

Based on observations of the third study participant, it was found that he brought a LCD that he purchased himself to use in class. This shows that he used technology-assisted teaching aids in implementing Historical Thinking Skills in History Teaching and Learning.

Overall, the researcher found that teachers are knowledgeable in using digital learning applications to implement Historical Thinking Skills in teaching and learning History. However, there are several challenges faced in implementing Historical Thinking Skills among History teachers. These challenges should be overcome, for example, by involving History teachers in in-service courses, especially exposure to knowledge on the use of digital learning applications in implementing Historical Thinking Skills so that the competence of History teachers can be improved.

Considering that there are no complete guidelines for them in applying digital learning to the implementation of Historical Thinking Skills, schools should provide relevant learning modules as a guide for teachers. In addition, the challenge for History teachers is also time constraints. For school-related challenges, teachers face challenges in infrastructure facilities and a lack of teaching aids, especially with the help of technology, which is quite limited. Although the study participants faced various challenges, they still showed continuous efforts to deal with them through a positive attitude. This approach allows the implementation of teaching and learning in the classroom to take place more systematically and effectively because the obstacles that exist can be managed constructively.

Suggested Implications of the Study

Based on the study analysis, every History teacher has a fairly good knowledge regarding the use of digital learning applications in implementing Historical Thinking Skills in teaching and learning History. Therefore, History teachers are highly required to have knowledge of the content of the subject itself as well as the latest pedagogical content, especially the use of digital applications so that they can implement Historical Thinking Skills effectively. This finding has implications for the national education system so that it is necessary to improve the competence of History teachers by conducting in-service courses and focusing on the implementation of Historical Thinking Skills. The Ministry of Education Malaysia, the Malaysian Institute of Teacher Education, universities, and State Education Departments must provide exposure regarding Historical Thinking Skills such as providing modules related to Historical Thinking Skills to teachers who teach History subjects so that teachers can implement Historical Thinking Skills better because they have special guidelines related to Historical Thinking Skills.

In addition, this study has implications for teachers who teach History subjects where they can still implement Historical Thinking Skills effectively if history teachers' knowledge of using digital learning applications for Historical Thinking Skills is well mastered. Teachers who teach History, even if they are not from the field of History specialization, are able to teach and implement Historical Thinking Skills well if they also master 21st century pedagogical knowledge, namely having knowledge in planning and providing interactive teaching aids despite the lack of infrastructure facilities and teaching aids in schools. As stated by Hanifah et al. 2020, educators today need to have knowledge in using digital technology so that the teaching and learning process can attract students' interest in gaining knowledge and exposure to more interesting and interactive teaching and learning processes in the classroom. In addition, History teachers have the potential to enrich students' learning experiences by utilizing various digital aids, thus changing their perceptions of this subject. The use of interactive virtual learning mediums can increase motivation and create a more interesting and meaningful learning atmosphere (Alias et al., 2021; Rashid & Yusoff, 2022).

CONCLUSION

Overall, the implementation of Historical Thinking Skills in History Teaching and Learning is greatly influenced by the level of teachers' knowledge, as well as the challenges they face. If challenges such as limitations of digital pedagogy, lack of specific training, and infrastructure constraints are not addressed, the effectiveness of Historical Thinking Skills in building students' critical and analytical thinking will be affected. Therefore, integrated support from schools, teacher training institutions, and policymakers is needed to strengthen teachers' competence in integrating technology and innovative pedagogical strategies. This is in line with the views of Hashim and Yunus (2022) who emphasize that History learning needs to be empowered through digital pedagogical innovations to ensure that it remains relevant and meaningful. Therefore, future studies should focus on developing a systematic intervention module or framework to help History teachers

overcome challenges, thereby producing a generation of students who are historically minded, critical, and reflective of past events.

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