

From Chalk to Clicks: Transforming Physical Education with Digital Tools and Resources

Zakiah Noordin and Mohamad Nizam Nazarudin

Abstract- This study objectives are to identify readiness to incorporate technology-based activities, skills, and knowledge to effectively integrate technology into teaching practices, and access to technological resources. This study employs a quantitative approach and a descriptive research design. The study targets 217 physical education teachers working in various secondary schools across a specific district in the state of Selangor, Malaysia. The selection of participants is based on a non-probability sampling technique, aiming for a broad representation of schools in the district. Data collected using a structured questionnaire and distributed in a digital format via Google Forms to facilitate ease of distribution and response collection. Descriptive statistics, including means, standard deviations employed to analyse the collected data. Readiness to Incorporate Technology indicates a moderate level of readiness among P.E. teachers, with the highest readiness seen in 'Attitudes towards Technology in Education' (Mean=4.65, SD=9.45). Skills and Knowledge for Integration indicates a moderate level, and teachers demonstrate relatively high proficiency with technology tools (Mean=3.95, SD=12.21) and an ability to adapt pedagogically (Mean=4.10, SD=10.42), indicating a strong foundation for integrating technology into teaching practices. Access to Technological Resources indicates a moderate level and notably low score in 'Availability of Devices' (Mean=1.98, SD=12.23). P.E. teachers show a readiness to incorporate technology and possess relevant skills, significant disparities in access to technological resources and varying levels of readiness and skills could hinder effective integration. Further research is needed to explore the underlying factors contributing to these disparities and to develop strategies to support teachers in overcoming these challenges.

Keywords: Physical, health, education, digital tools, technology, teaching,

I. INTRODUCTION

In the realm of physical and health education, the integration of technology has become increasingly paramount, particularly in the training and readiness of pre-service teachers. The advent of digital tools and platforms present a unique opportunity to enhance

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teaching practices, making physical education more engaging and accessible. This research article aims to explore pre-service teachers' readiness to incorporate technology-based activities, their proficiency in integrating these technologies into their teaching practices, and their access to technological resources. Recent studies underscore the significance of technological pedagogical content knowledge (TPACK) in the effective integration of technology in education. The development and validation of TPACK frameworks are crucial for understanding how pre-service teachers can leverage technology to enhance educational outcomes (Schmidt et al., 2009). Moreover, the role of technology in physical education, especially in the wake of the COVID-19 pandemic, has been highlighted, emphasizing digitalization as a tool for sustaining health and learning during challenging times (Suelves et al., 2023)

The literature reveals a growing interest in this area, with a notable increase in publications related to the development of pre-service teachers' TPACK (Su, 2023). The United States, Turkey, Australia, Hong Kong, Taiwan, and Singapore emerge as leading contributors to this body of research, indicating a global recognition of the importance of technology integration in teacher education (Su, 2023). Furthermore, the COVID-19 pandemic has accelerated the digitalization of education, underscoring the need for innovative teaching strategies that incorporate digital tools and platforms. This shift has necessitated adaptations in teaching and learning processes, with technology playing a pivotal role in maintaining the continuity of education, including physical education (Suelves et al., 2023).

This study contributes to the growing body of knowledge by providing insights into pre-service physical and health education teachers' readiness for technology integration, their technological skills and knowledge, and their access to necessary resources. By examining these aspects, the research aims to inform teacher education programs and policymaking, ensuring that future educators are well-equipped to navigate the digital landscape of education.

Integrating technology into physical and health education requires a strategic approach, focusing on curriculum development, teacher training, and infrastructure:

1. **Curriculum Development:** Incorporating technology-based activities, such as exergames and VR sports simulations, can make physical education more engaging. Developing modules that teach students about health monitoring using wearable technologies can also be beneficial.
2. **Teacher Training:** Educators should be equipped with the necessary skills and knowledge to

effectively integrate technology into their teaching practices. This includes training on the use of various technological tools and platforms, as well as understanding how to leverage data from these technologies to tailor physical education programs to individual student needs.

3. **Infrastructure and Access:** Ensuring equitable access to technological resources is crucial. Schools should invest in the necessary infrastructure, including high-speed internet, digital devices, and specialized equipment for AR and VR experiences.

The primary aim of this research is to evaluate the readiness of Physical and Health Education (P.E.) teachers in a district of Selangor, Malaysia, to integrate technology into their teaching practices. Specifically, the study seeks to assess their readiness to incorporate technology-based activities, their skills and knowledge for effective technology integration, and their access to technological resources.

II. METHODOLOGY

Research Design

This study employs a quantitative approach and a descriptive research design. Such a design is apt for systematically describing the phenomenon of interest in this case, the technological readiness of P.E. teachers - without influencing the study environment. This approach enables the collection of quantifiable data that can be statistically analysed to draw conclusions about the population under study.

Participants

The study targets 217 P.E. teachers working in various secondary schools across a specific district in the state of Selangor, Malaysia. The selection of participants is based on a non-probability sampling technique, aiming for a broad representation of schools in the district.

Data Collection Instrument

Data collected using a structured questionnaire developed specifically for this study. The questionnaire distributed in a digital format via Google Forms to facilitate ease of distribution and response collection. It encompasses several sections designed to gauge:

1. **Readiness to Incorporate Technology-Based Activities:** Questions explore teachers' attitudes towards familiarity with technology, perceived efficacy, resource availability, training and professional development and technology in education.
2. **Skills and Knowledge for Technology Integration:** This section assess teachers' self-reported proficiency with technology tools, data utilization, pedagogical adaptation, student engagement through technology, and professional development and training.

3. **Access to Technological Resources:** Questions delve into the availability of devices, internet connectivity, technological support and maintenance, professional development in digital tools and pedagogical integration of technology.

Pilot Testing

Before the main data collection, a pilot test conducted with a smaller sample of P.E. teachers to ensure the reliability and validity of the questionnaire. Feedback from the pilot study be used to refine the questionnaire.

Data Analysis

Descriptive statistics, including means, standard deviations employed to analyse the collected data. This analysis provides a comprehensive overview of the current state of technological readiness among P.E. teachers in the district, highlighting areas of strength and opportunities for improvement.

Ethical Considerations

The study adheres to ethical standards, ensuring the confidentiality and anonymity of participants. Informed consent obtained from all participants, emphasizing the voluntary nature of their participation and their right to withdraw at any time without consequence.

Limitations

The study's findings specific to the selected district in Selangor and may not be generalizable to other regions or contexts. Furthermore, the reliance on self-reported data may introduce response bias, potentially affecting the accuracy of the results.

By providing insights into the technological readiness of P.E. teachers, this study aims to contribute to the ongoing discourse on technology integration in education, with implications for policy, teacher training, and resource allocation within the Malaysian education system.

III. FINDING AND DISCUSSION

Based on table 1, analysis shows:

Readiness to Incorporate Technology

The overall mean score indicates a moderate level of readiness among P.E. teachers, with the highest readiness seen in 'Attitudes towards Technology in Education' (Mean=4.65, SD=9.45). The high variability (SD) across sub-variables suggests diverse perceptions among teachers.

Skills and Knowledge for Integration

Teachers demonstrate relatively high proficiency with technology tools (Mean=3.95, SD=12.21) and an ability to adapt pedagogically (Mean=4.10, SD=10.42), indicating a strong foundation for integrating technology into teaching practices.

Access to Technological Resources:

The mean scores show varying levels of access, with a notably low score in 'Availability of Devices' (Mean=1.98, SD=12.23), suggesting significant challenges in this area.

TABLE 1: DESCRIPTIVE ANALYSIS

Variables	Sub variables	Min	SD
1 Readiness to incorporate technology-based activities		3.69	6.78
	Familiarity with Technology	3.87	7.89
	Perceived Efficacy	3.78	9.45
	Resource Availability	3.45	4.56
	Training and Professional Development	2.74	12.34
	Attitudes towards Technology in Education	4.65	9.45
	3.83	8.65	
2 Skills and knowledge to effectively integrate technology into teaching practices.		3.83	8.65
	Proficiency with Technology Tools	3.95	12.21
	Data Utilization	3.89	11.34
	Pedagogical Adaptation	4.10	10.42
	Student Engagement through Technology	4.16	9.34
	Professional Development and Training	3.12	10.12
	3.10	8.83	
3 Access to technological resources.		3.10	8.83
	Availability of Devices	1.98	12.23
	Internet Connectivity	3.12	8.98
	Technological Support and Maintenance	2.45	7.34
	Professional Development in Digital Tools	3.56	9.47
	Pedagogical Integration of Technology	3.89	10.34

Interpretation and Discussion

The moderate readiness of P.E. teachers to integrate technology, combined with their relatively high proficiency in using technology tools and adapting pedagogically, points to a promising potential for technology-enhanced physical education. However, the significant variation in scores, particularly within readiness and access to resources, highlights disparities among teachers, which could be influenced by factors such as school infrastructure, personal attitudes, and previous exposure to technology in education. The low availability

of devices presents a critical barrier to technology integration, underscoring the need for improved resource allocation within schools. This finding aligns with the Diffusion of Innovations theory (Rogers, 2003), suggesting that the lack of resources can impede the adoption of new technologies, despite individual readiness and willingness to innovate.

Relation to Previous Research and Theories

The high value placed on 'Attitudes towards Technology in Education' resonates with the Technology Acceptance Model (TAM), which posits that positive attitudes towards technology significantly influence its acceptance and use (Davis, 1989). The varied readiness and skills levels among teachers reflect the findings of Mishra and Koehler (2006), who emphasized the importance of developing Technological Pedagogical Content Knowledge (TPACK) to effectively integrate technology into teaching. The disparities in access to technological resources echo the concerns raised by Selwyn (2013) regarding the digital divide in education, highlighting that equitable access remains a challenge. The results also underscore the importance of professional development, as supported by Koehler and Mishra (2009), who advocate for ongoing training to enhance teachers' technological, pedagogical, and content knowledge.

Conclusion

This analysis suggests that while P.E. teachers show a readiness to incorporate technology and possess relevant skills, significant disparities in access to technological resources and varying levels of readiness and skills could hinder effective integration. Addressing these disparities through targeted professional development and equitable resource distribution could enhance the integration of technology into physical education. Further research is needed to explore the underlying factors contributing to these disparities and to develop strategies to support teachers in overcoming these challenges.

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