

## **EduTechPJ<sup>®</sup>: A Digital Competency Module for Physical Education Teachers**

Noor Azizah Abd Rahman, Universiti Kebangsaan Malaysia, Malaysia  
Nurwina Anuar, Universiti Kebangsaan Malaysia, Malaysia  
Aidah Abdul Karim, Universiti Kebangsaan Malaysia, Malaysia  
Ahmad Rizal Mohd Yusof, Universiti Kebangsaan Malaysia, Malaysia

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### **Abstract**

The aim of this study was to investigate the development and evaluation of the EduTechPJ<sup>®</sup> Module in enhancing the digital competencies of secondary school Physical Education teachers. The EduTechPJ<sup>®</sup> Module was developed by implementing the ASSURE Instructional Model and adapting the European Framework of Digital Competence of Educators (DigCompEdu), applying elements of Connectivism and Boyatzis' Theories as well as collaborative learning strategies. The design and development research process is divided into three critical phases: i) needs analysis; ii) design and development; and iii) implementation and evaluation. The needs analysis phase measures the need for a module with the integration of artificial intelligence elements. A combination of information from multi-methods analysis through semi-structured interviews and surveys was used for the needs analysis. The design and development phase using the Fuzzy Delphi Method is leveraged to gain expert consensus on various aspects, including module content design and pedagogical strategies. The final phase encompasses implementation and evaluation, aimed at appraising the usability and effectiveness of the module within actual training contexts. Key findings revealed that the module, grounded in Connectivism, Boyatzis' Theory, and the DigCompEdu Framework, significantly improved teachers' digital competencies, as demonstrated by pre- and post-test results. Additionally, high usability scores and positive feedback affirmed the module's practicality, accessibility, and relevance. The training also led to sustained behavioral changes, with teachers applying their newly acquired skills in schools, enhancing lesson delivery and job performance. Hence, these findings provide an effective and practical training solution to support technology integration in teaching practices.

*Keywords:* digital training, integration of digital technology, teachers' digital competency, teachers' professional development, physical education

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## Introduction

In the era of rapid technological advancements, digital competence emerged as a critical focus in education (Vásquez-Pajuelo et al., 2024). This shift is driven by the growing digitization of society and the economy as well as preparing the learners for the demands of the 21st century. The integration of technology has transformed educational practices, making learning more accessible, interactive, and flexible. Consequently, both teachers and students possess strong digital skills and attitudes to navigate the digital education landscape effectively (Brändle et al., 2023; Napitupulu et al., 2024). However, the findings by Kementerian Pendidikan Malaysia (2023) indicated that the level of digital competence measured in 2021, with the involvement of 297,018 teachers, there were 6,442 (2.2%) teachers at the advanced level, 118,651 (39.9%) at the intermediate level and as many as 171,925 (57.9%) teachers at the basic level. From this finding, it showed that 57.9% of teachers are aware of and try to use digital technologies but do not use them according to the situation that suits the various available digital technologies. Moreover, findings from the research by Wallace et al. (2023) specifically showed that Physical Education Teachers (PETs) have significantly low digital competency levels with limited comprehension of teachers' digital competency within the context of physical education. Moreover, Hamalainen et al. (2021) highlighted the importance of equipping both teachers and students with digital capabilities to ensure meaningful participation in digital education. These challenges underline the need for innovative solutions to enhance the digital competency of teachers, particularly in designing and delivering technology-enhanced learning experiences.

Accordingly, teachers must possess a thorough awareness of the numerous digital tools and technologies accessible to integrate them into their teaching methods in an efficient manner. This is supported by findings by Mohamed Faizul et al. (2021) that showed the need for teachers to have a willingness to teach, a strong effort and a good presentation in teaching. This involves being familiar with educational software, communication tools, multimedia resources, and internet platforms in order to design engaging and interactive classes that meet the various learning needs of their students by becoming familiar with these resources. Digital technologies also facilitate the learning of new methods, acquisition of skills, and accessing information on specific topics. This widens the scope for enhancing and innovating pedagogical methods (Xing & Qi, 2022).

Therefore, in order to foster competency development in digital technology among PETs, this EduTechPJ<sup>®</sup> Module is developed especially for PETs to integrate digital technology into their lessons as well as in the organization. Moreover, a module is an efficient way to combine techniques, teaching methods, multimedia technologies, and instructor expertise and the introduction of new instructional technologies can be made possible (Saliyeva & Ibragimova, 2021). The EduTechPJ<sup>®</sup> module is critical in addressing the digital competency gap among PETs, which is essential for transforming education to meet 21st-century demands. By providing training, the module enhances their proficiency in using digital tools and innovative teaching strategies. In addition, the module builds confidence and competence in utilizing digital tools, positioning them as leaders in technological integration within their schools. Furthermore, The EduTechPJ<sup>®</sup> module is designed using a combination of Connectivism Theory, Boyatzis Competency Theory, Digital Competence for Educators (DigCompEdu) and collaborative learning strategies to ensure its effectiveness in enhancing the digital competency of PETs. By integrating these elements of theories and framework, the EduTechPJ<sup>®</sup> module not only equips PETs with practical digital skills but also cultivates the mindset and adaptability required to thrive in a digital education field. This holistic approach

ensures that the module effectively addresses the needs of PETs, driving meaningful improvements in teaching practices and contributing to the broader transformation of the education system especially towards 21st century education.

### **Theoretical Foundation and Instructional Strategy**

The EduTechPJ<sup>®</sup> Module is built upon solid theoretical and pedagogical foundations, incorporating Connectivism Theory, Boyatzis' Competency Theory, and Collaborative Learning Strategies to enhance teachers' digital competencies. In response to the evolving nature of education in the digital age, Connectivism Theory evolved in the early years of the 21st century. The theory was introduced by Siemens and Downes (2022) to provide a framework for understanding learning in an era characterized by rapid knowledge expansion and technological advancement. In addition, the theory of connectivism presents a new point of view on education in the digital era. It offers a framework for comprehending how people might navigate and make sense of the enormous amount of information available by acknowledging the power of networks and relationships as well as mental connections between pieces of information during interaction with various information sources (Yousef et al., 2020). Moreover, principles of Connectivism theory include learning as a network process, the importance of connections and networks, distributed cognition and knowledge as dynamic entity. Furthermore, this theory could assist teachers in crafting a learning environment whereby learners augment their existing understanding of sustainability through online interactions and accessing digital knowledge resources (Boyras & Ocak, 2021; Dziubaniuk et al., 2023). Indirectly, it encourages students to connect and work together more easily by using digital resources such as social media and online forums.

On the other hand, Boyatzis competency theory is a concept that concentrates on how people build their emotional intelligence and competencies (Boyatzis, 2008). From the findings, it also realizes the significance of abilities in influencing both individual and organisational success. Competencies, which are a collection of knowledge, skills, abilities, and behaviours that support successful performance in a particular position or domain, are the fundamental building blocks of Boyatzis competency theory. There are various types of competencies, including technical competencies that are unique to a given job or profession and behavioural competencies that are connected to emotional intelligence and interpersonal skills (Albino, 2018). Furthermore, competency theory also acknowledges that emotional, social and cognitive intelligence are constructs that may be improved with time and can be developed (Boyatzis, 2008). It suggests a developmental paradigm that indicates many stages of competency growth, from beginner to master. The approach places a strong emphasis on the value of continuous learning, evaluation, and introspection for the development of competencies.

In addition, collaborative learning strategy focus on the interaction and cooperation in the learning process. Components of a collaboration learning strategy include group projects and assignments, peer-to-peer learning and collaboration problem-solving (Khlaif & Salha, 2021). Group projects and assignments are a typical part of collaborative learning strategies. In this study, PETs collaborate in groups to do assignments, find solutions to issues, or produce presentations. This encourages teamwork, shared accountability, and idea sharing. While peer-to-peer learning can be done through discussions and the exchange of information and experiences. This fosters a feeling of belonging and motivates participation in the educational process (Malan, 2021). Furthermore, collaborative learning enhances creativity, critical thinking, and the ability to evaluate and appreciate diverse perspectives. Therefore, the

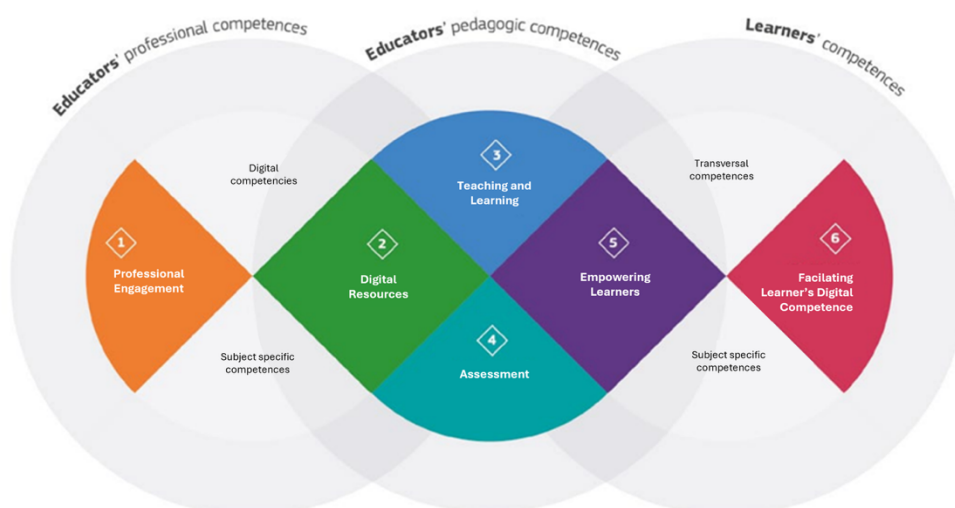
integration of the European Framework of Digital Competence of Educators (DigCompEdu) framework with Connectivism Theory, Boyatzis' Competency Theory, and collaborative learning strategies enables PETs to utilize digital technology more effectively as a platform for instructional delivery and for accessing a wide range of learning materials. In line with this integration, the DigCompEdu framework serves as the primary reference for defining and structuring the digital competencies embedded in the EduTechPJ<sup>®</sup> Module.

### Adaptation of the European Framework of Digital Competence of Educators (DigCompEdu)

The DigCompEdu Framework was introduced by Redecker (Redecker, 2017) and highlights the holistic area of competency digital as an educator. Moreover, DigCompEdu is a comprehensive framework that shares features with other frameworks that are used internationally (Cabero-Almenara et al., 2020) and is generic for use in different educational situations (Caena & Redecker, 2019). Furthermore, the DigCompEdu framework targets teachers across all educational levels, spanning from early childhood to higher and adult education, encompassing general and vocational training, special needs education, and informal learning contexts (Redecker, 2017). DigCompEdu framework consists of three competency areas defined primarily as educators' professional competences, educators' pedagogic competences and learners' competences. The EduTechPJ<sup>®</sup> Module was created by adapting these digital competencies. These three competence areas consist of six different areas, which are professional engagement, digital resources, teaching and learning, assessment, empowering learners, and facilitating learners' digital competences. From these areas, it is clear that digital competency is not solely utilized in teaching and learning but it also serves as an integral aspect of an educators' overall role.

**Figure 1**

*DigCompEdu Framework (Redecker, 2017)*

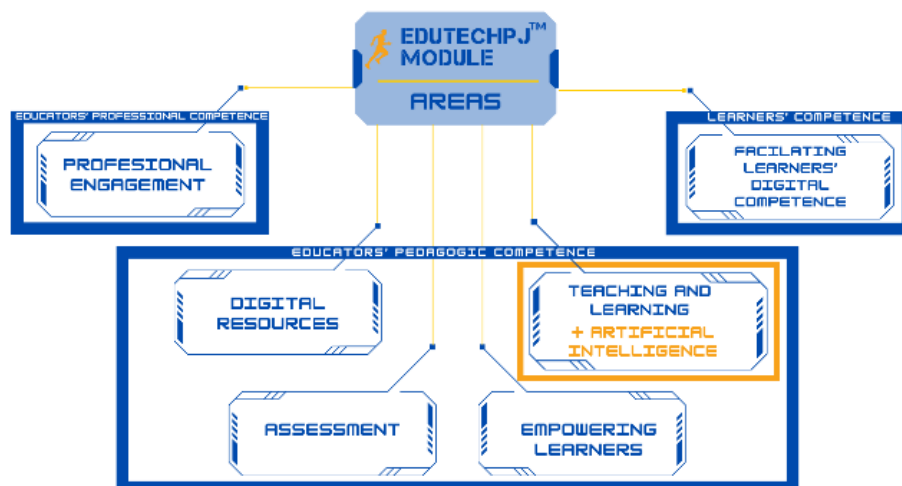


However, the rapid advancement of artificial intelligence (AI) (Ejjami, 2024) has made it imperative to incorporate AI components into the DigCompEdu framework in order to ensure that teachers remain abreast of the latest technological advancements. In this study, AI is embedded to provide teachers with knowledge and tools to leverage AI-driven solutions, such as intelligent systems, adaptive learning platforms, and data analytics, to enhance their professional practices. This comprehensive integration ensures that PETs can adopt innovative approaches across various aspects of their roles, aligning with the demands of

modern digital education and fostering improved learning outcomes. Figure 2 introduced the adaptation of the DigCompEdu Framework by (Redecker, 2017).

**Figure 2**

*Adaptation of DigCompEdu Framework in EduTechPJ<sup>®</sup> Module*



Therefore, the aim of this study was to investigate the development and evaluation of the EduTechPJ<sup>®</sup> Module in enhancing the digital competencies of secondary school PETs.

## Methodology

### Design

In this study, the design and development research by Richey and Klein (2007) served as the approach for this module development. In addition, design and development research can give informative data to the researchers to make decisions and ensure the module has a high impact especially to the PETs. Furthermore, this design is a systematic and highly structured research process in order to establish an empirical foundation for constructing modules for specific subject matter (Richey & Klein, 2007). The design and development research has 3 important phases including i) needs analysis; ii) design and development; and iii) implementation and evaluation (Saedah et al., 2013). Thus research methodology is grounded with ASSURE Instructional Model to provide a comprehensive instructional design that supports the development of digital competency modules for PETs. This model is particularly suitable for designing and developing this module because it is more effective in designing instructional materials that focus on technology integration and learning media (Hasna Nirfya & Ema, 2022). Moreover, since the development of the EduTechPJ<sup>®</sup> Module highlights technology usage from an overall teaching profession perspective, the ASSURE model can be categorized as practical and implementable in teaching and learning activities (Stavinibelia et al., 2023; Yudi Hari & Supriyo, 2021). The model follows a systematic approach which begins with analyses learners, state objectives, select media, methods and materials, utilize media, methods and materials, require learner performance and evaluation. All these elements are arranged systematically according to the design and development research approach. For this research, Type 1 which refers to specific product or program design, project development and evaluation of design and development research is selected because it produces a product which is the EduTechPJ<sup>®</sup> Module that is specific for PETs. Table 1 showed the summary of ASSURE Model according to the design and development research phase.

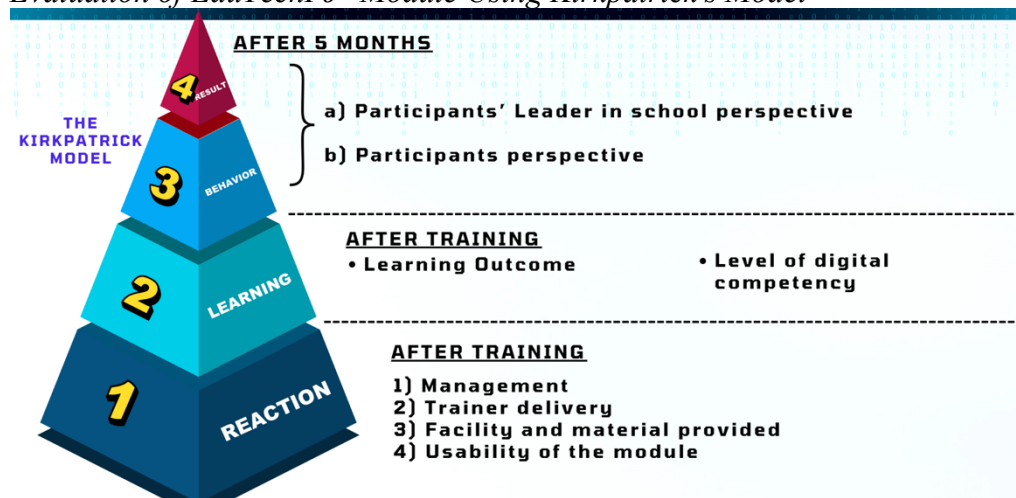
**Table 1***The Summary of ASSURE Model According to the Design and Development Research Phase*

Phase of Design and Development Research	ASSURE Instructional Model	Explanation
Phase 1 (Need Analysis)	A: Analyze Learners	Analysis of teacher competency levels and the agreement by experts to develop a digital competency module for PETs
Phase 2 (Design and Development)	S: State learning objectives	State the objective of module development
	S: Select media, methods and materials	Choose media, methods and teaching materials that suit the PE Secondary School curriculum content
	U: Utilize media, methods and materials	Develop and utilize media by integrating technology in teaching and learning materials
Phase 3 (Implementation and Evaluation)	R: Require learner responses	The implementation of EduTechPJ <sup>®</sup> module
	E: Evaluation	Evaluate the usability and effectiveness of the EduTechPJ <sup>®</sup> module base on Kirkpatrick Evaluation Model

In the first phase of design and development research which need analysis, the researchers also conducted a survey to identify the digital competency level of PETs. Instead of the survey, the researchers also explored all the problems and challenges arose among PETs in integrating the digital technology in their. The importance of developing the digital competency module for PETs was highlighted by this data collection. The interviews session was held by focus group discussion to get as many and depth information including thoughts, opinions and experiences of the PETs. In the second phase of design and development research, design and develop a module is required. In the design phase, the elements of state objectives (S), select media, methods and materials, (S) utilize media, methods and materials (U) in ASSURE instructional model elements were implemented. All these elements were firstly designed by the experts in specific area including, technology education, physical education and training module experts. The consensus of those experts was analyzed using Fuzzy Delphi Method (FDM). Additionally, in order to determine the extent to which the components and elements are appropriate in development phase, there needs to be a content validation process for the components and elements. This process to ensure it have been accurately defined.

The final phase of design and development research is implementation and evaluation. In this study, the EduTechPJ<sup>®</sup> module was evaluated using a structured training program implemented for secondary school PETs. In the other hand, the Kirkpatrick's Evaluation Model was used to guide the evaluation of the usability and effectiveness of EduTechPJ<sup>®</sup> Module through Digital Competency training. This well-established framework provides a structured approach to evaluating the impact of training interventions across four key levels: i) reaction; ii) learning; iii) behavior; and iii) results as shown in Figure 3.

**Figure 3**  
*Evaluation of EduTechPJ<sup>®</sup> Module Using Kirkpatrick's Model*



For the purposes of this evaluation phase, the researchers examined all four levels of the model. At the reaction level, the researchers conducted a usability evaluation as well as the effectiveness of the training in terms of management, trainer delivery, facility, and material provided. The study then examined the learning level by employed a pretest-posttest design where PETs' digital competency levels were measured before and after the training intervention. In addition, a survey was carried out to evaluate the participants' learning outcomes immediately after the training session.

In addition, to evaluate changes in PET's behavior as outlined in the behavior level of Kirkpatrick's Evaluation Model and to assess the application of the acquired digital competencies, the researchers gathered perspectives from the participants themselves as well as from their principals five months after the training. This longitudinal assessment provided insights into the sustained impact of the EduTechPJ<sup>®</sup> module on teaching and learning practices. Following the behavior level of Kirkpatrick's Model, the evaluation progressed to the highest level, which is results. In this level, broader organizational and institutional outcomes are examined, including the overall digital integration within the participating schools. By integrating these complementary methodological approaches across all four levels of Kirkpatrick's Model, the researchers aimed to gain a comprehensive understanding of the EduTechPJ<sup>®</sup> module's impact on the targeted group of secondary school PETs.

### ***Participants***

For the need analysis phase, this study involved 169 secondary school PETs from nine schools in Selangor, Malaysia, selected through purposive sampling. A self-assessment digital competency survey was conducted to evaluate their proficiency levels, followed by semi-structured interviews with nine experts to gain qualitative insights into their experiences and challenges.

For the second phase of design and development research, there were two stages involved in the design and development phase, which are the module design stage and the module development stage. A total of 16 experts in the fields of educational technology, physical education, and module development were involved in this stage. All the selected experts had extensive experience and had served for more than five years in their respective fields. The criteria for expert selection are aligned with Berliner (2004), who stated that an individual is

considered proficient in a particular field if they have more than five years of experience in that field. In the module development stage, five experts in technology education, physical education, pedagogy, and training module experts were given the module to be validated in terms of the objective, adaptation of DigCompEdu Framework, applying Connectivism, Boyatzis Competency, and Collaborative Learning Strategies. At the third phase of design and development research, the researcher conducted digital competency training using the EduTechPJ<sup>®</sup> Module involving 38 secondary school PETs in Selangor selected through purposive sampling. Demographics such as gender, age, school location, teaching experience, and qualifications of the participants were determined in this study.

### ***Instrument***

In the need analysis phase, the researcher utilized a questionnaire adapted from the SelfieforTeachers questionnaire, and was based on the DigCompEdu Framework, which is widely used in the field of teachers' digital competencies. The researcher translated the instrument's questions and tailored them to suit the Malaysian context and conditions. The questionnaires of the interview session have been evaluated by experts with expertise in technology education and physical education. Nonetheless, the researchers themselves serve as the primary tool in this investigation. According to Gay et al. (2012), the researcher serves as the main tool for gathering data. Then, it followed by the second phase of the design and development research which is design and development. In this phase, the researcher employed the Fuzzy Delphi Method (FDM) to determine the elements to be included in the module. The instrument used in this FDM was a fuzzy questionnaire that had been reviewed by experts in educational technology and physical education. After obtaining validation, the questionnaire was distributed to 16 experts in the fields of educational technology, physical education, and module development.

Subsequently, after developing the module based on the analysis conducted during the design phase, a module validation instrument was employed to ensure that the features identified in the design phase were incorporated into the module. This instrument was adapted from the studies of (Muhammad Nidzam Yaakob, 2016; Syar Meeze, 2021). Since this was a validation instrument derived from the design phase, the same constructs were used, but with a different scale applied, considering the exclusion of items following the module design analysis.

Lastly, for the third phase of design and development research which is implementation and evaluation, the questionnaire was distributed to the participated PETS to analyze the usability of the digital competency module. This questionnaire was adapted from the studies of (Muhammad Nidzam Yaakob, 2016; Syar Meeze, 2021). It was based on the usability questionnaire by (Lund, 2001), known as the USE questionnaire (Usefulness, Satisfaction, Ease of Use). However, in order to assess the EduTechPJ<sup>®</sup> module effectiveness, the researchers utilized the EduTechPJ<sup>®</sup> Effectiveness Questionnaire, which was designed based on Kirkpatrick's evaluation levels.

### ***Analysis***

In the first phase of design and development research, the findings of survey were analyzed using the Statistical Package for the Social Sciences (SPSS) version 29.0. The data were then processed using descriptive statistical procedures. This analysis followed by the thematic analysis whereby the data from the verbatim interviews were analysed using the NVIVO

software. According to Creswell and Creswell (2018), validity and reliability refer to how well and consistently a study's results reflect the topic under investigation. To increase the study's validity and reliability, the researcher employed expert verification techniques.

Next, FDM method was used to analysis the module's content by gathering input from 16 experts. Experts provided their feedback on a 7-point scale using a predefined linguistic scale, which was then converted into triangular fuzzy numbers for analysis. The defuzzification process was applied to compute the average agreement levels, and three key conditions were used to determine consensus: i) the threshold value ( $d$ ) must be  $\leq 0.2$ , ii) the percentage of expert agreement must be  $\geq 75\%$ , and iii) the fuzzy score ( $A$ ) must be  $\geq 0.5$ . These criteria ensured that the validation process was objective and met the required standards for agreement among experts. This process ensured that the module was aligned with expert opinions and achieved high reliability and validity.

From the analysis, the acceptance of each element was stated in order to know the most suitable elements that will be used in the module. After the design process by the experts had done, the development of the module took place. In order to develop the module, the Canva Pro Application was used. It is user friendly, easy to access and enables fast editing as well as updated. The elements from the design process were implemented in the module including the DigCompEdu Framework, theoretical foundation of Connectivism and Boyatzis Competency Theories and Collaborative Learning Strategies. All theories, framework and learning strategies used were aligned with the module objectives.

Lastly, for the last phase of design and development research, the researcher used SPSS version 29.0 in order to employ descriptive analysis to examine the usability and effectiveness of the module. Additionally, to evaluate the effectiveness of the training using the EduTechPJ<sup>®</sup> Module, the researcher also conducted a paired t-test to identify statistical differences. In this study, the paired t-test analysis was performed using the same sample using pretest and posttest.

## Results

A self-assessment digital competency survey involving 169 secondary school PETs revealed that most are at the C1 (leader) level of the DigCompEdu framework. This indicates that they effectively use digital technology to enhance pedagogical and professional practices, share innovative ideas, and inspire others. Despite their high competency, the findings highlight the need for a digital competency module to guide the integration of digital technology, specifically within PE teaching and management.

However, interviews with nine experts, each with 7 to 22 years of experience in PE, revealed that digital technology is rarely used and often depends on lesson content. While experts acknowledged the benefits of digital tools for teaching, learning, and administrative tasks, they also identified challenges such as limited infrastructure, financial constraints, lack of training, and negative perceptions of PE. These findings emphasize the importance of a tailored module addressing teachers' needs, including video creation, quiz applications, and digital tools to overcome these barriers.

The findings from phase two indicated that the researcher successfully developed a digital competency module for secondary school PETs based on Connectivism Theory, Boyatzis Competency Theory, DigCompEdu framework, and collaborative learning strategies based

on the consensus of 16 experts. The expert panels were selected based on clear criteria, including a minimum of five years of professional experience, academic qualifications, and expertise in educational technology, physical education, and training module. Therefore, the innovation introduced through this module represents a novelty and catalyzes future digital technology modules for PE teachers.

Lastly, the third phase represents the final stage in the development and evaluation of the digital competency module for secondary school PE teachers (EduTechPJ). The findings from this study demonstrate that the EduTechPJ Module meets the usability criteria and addresses the needs of these teachers. Furthermore, the empirical findings from the five-month implementation period showcased exceptionally high levels of agreement among participants and educational leadership. The data reveals a highly positive response, with PETs reporting substantial improvements in their digital competencies and technological integration capabilities. The evaluation findings further reveal that PETs were able to confidently apply new digital knowledge in their professional role, demonstrating a notable increase in their ability to perform tasks more effectively. Additionally, the module contributed to enhancing their work performance and boosting their motivation in carrying out their professional responsibilities. These outcomes indicate that the module not only equipped the participants with relevant digital skills but also positively impacted their confidence, efficiency, and overall workplace engagement. More critically, school principals and administrative leaders of the PETs in each school also provided overwhelmingly supportive feedback indicating the module's alignment with broader institutional technology integration goals.

## Discussion

This study highlights the successful development and evaluation of the EduTechPJ<sup>®</sup> Module, designed to enhance the digital competencies of secondary school PETs. The module addresses critical gaps in digital technology integration due to limited resources, insufficient training, and technical challenges.

Through a structured design process guided by the ASSURE model and validated by experts, the module demonstrated high usability and effectiveness. Additionally, this research offers significant theoretical implications by extending the application of Connectivism Theory and Boyatzis Competency Theory within the context of teacher education. Specifically, it demonstrates how these theories can guide the development of a digital competency module tailored for PETs. Moreover, by integrating the DigCompEdu framework and collaborative learning strategies, the study also enriches the understanding of how digital competency development can be aligned with theoretical models to address the unique needs of educators in the 21st century. Similarly, Al Mamun et al. (2020) showed high practicality when using structured learning guidance effectively. In addition, validation thresholds are essential in ensuring the reliability and credibility of expert validation processes (Hsu & Sandford, 2007; Yusoff, 2019). In this study, the Fuzzy Delphi Method was utilized with clearly defined thresholds to establish consensus among the 16 experts. These thresholds included a threshold value ( $d$ )  $\leq 0.2$ , expert agreement  $\geq 75\%$ , and a fuzzy score ( $A$ )  $\geq 0.5$ . Such measures ensure that the findings reflect a high level of methodological rigor and reliability. The use of these validation thresholds provides confidence in the module's design and alignment with educational objectives, further reinforcing the credibility of the research findings.

Training sessions with 38 PE teachers, evaluated using Kirkpatrick's Evaluation Model revealed significant improvements in digital competencies, high levels of usability and positive feedback on the module's effectiveness. The feedback from school leaders, including participants' leaders and principals, highlights the positive changes observed in the teachers' integration of digital tools into their teaching practices and overall professional responsibilities. These findings underscore the module's sustained impact not only on the participants' competencies but also on their ability to apply these skills in real-world teaching and learning in schools. This aligns with previous research, which emphasizes that sustained application of digital skills by teachers supported by administrators is crucial for enhancing digital teaching performance (Arnel Sumaya Alde, 2023).

These findings indicate that the EduTechPJ<sup>®</sup> Module is an effective and practical approach to enhancing the digital competencies of PETs. Its development and evaluation offer valuable insights for policymakers, educators, and researchers seeking to address the challenges of integrating technology into education. The module not only bridges existing gaps in digital competency but also catalyzes creative and innovative teaching practices, paving the way for future advancements in educational technology.

### **Conclusion**

This study aimed to investigate the development and evaluation of the EduTechPJ<sup>®</sup> Module in enhancing the digital competencies of secondary school PETs. The research addresses the gap in digital integration among PE teachers by providing a structured, evidence-based training module tailored to their professional needs. Key findings revealed that the module, grounded in Connectivism Theory, Boyatzis' Competency Theory, and the DigCompEdu Framework, significantly improved teachers' digital competencies, as demonstrated by pre- and posttest results. Additionally, high usability scores and positive feedback affirmed the module's practicality, accessibility, and relevance. The training also led to sustained behavioral changes, with teachers applying their newly acquired skills in schools, enhancing lesson delivery and job performance.

These findings underscore the broader significance of the EduTechPJ<sup>®</sup> Module in bridging competency gaps and advancing technology integration in PE education. By providing teachers with essential digital skills, the module has the potential to transform teaching practices, improve student engagement, and inspire similar innovations in professional development. Future research could explore the long-term impact of the module on educational outcomes, its scalability across different educational contexts, and adaptations for other subject areas. Further studies could also examine the integration of emerging technologies to ensure the module remains relevant in an evolving digital environment in education.

### **Declaration of Generative AI and AI-Assisted Technologies in the Writing Process**

The author declares that Grammarly, an AI-assisted writing software, was used in proofreading and refining the language used in the manuscript. The usage was limited to correcting grammatical and spelling errors and rephrasing statements for accuracy and clarity. The author further declares that, apart from Grammarly, no other AI or AI-assisted technologies have been used to generate content in writing the manuscript. The ideas, design,

procedures, findings, analyses, and discussion are originally written and derived from appropriate and systematic conduct of the research.

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**Contact email:** [nurwina@ukm.edu.my](mailto:nurwina@ukm.edu.my)