

Digital Competence as a Predictor of Pedagogical Practices among Teacher Educators: An Empirical Study

Swarnaprava Behera¹ and Laxmidhar Behera²

¹Research Scholar and ²Professor of Education, Head

^{1,2}Department of Education, Regional Institute of Education, NCERT, Bhubaneswar

¹133swarnaprava@gmail.com (Corresponding Author)

Manuscript Submission Date: October 24, 2025

Manuscript Acceptance Date: December 31, 2025

Abstract

The digital competence and pedagogical practices are interrelated to each other, as effective teaching increasingly depends on the ability of teachers to integrate technology and implement innovative, student-centred strategies that enhance learning outcomes. The present study aimed to assess the level of digital competence among teacher educators in DIETs (District Institutes of Education and Training) of Odisha, examine its relationship with their pedagogical practices, and investigate its impact on overall pedagogical effectiveness. This study adopted a descriptive correlational research design, and a total of 100 teacher educators were selected through a multi-stage sampling technique as the sample. Data were collected through two Likert scales, and the collected data were analysed through SPSS-22 using descriptive statistics, Pearson correlation, and linear regression. The results of the study revealed that there was a moderate to high level of digital competence among teacher educators and a significant positive relationship ($r = 0.305$, $p < 0.05$) between digital competence and pedagogical practices was found. Further, the analysis also revealed that digital competence was a strong predictor of pedagogical effectiveness. These results emphasised the need and importance of continuous professional development and promoting digital competence skills within teacher education programs for technology-integrated instruction and effective teaching. The study concluded that digital competence is an important factor for improving pedagogical quality and also helps the prepared teachers with 21st-century skills.

Keywords: Digital Competence, Pedagogical Practices, Teacher Educators

Introduction

Digital transformation is the thoughtful integration of digital technology into various kinds of society, including education, where digital tools, platforms, and resources are used to enrich both teaching and learning experiences (Kiryakova and Kozhuharova, 2024). The early 2000s showed a turning point with the rise of mobile technology, personal computers, and the internet, which opened new possibilities for interactive learning, easy access to information,

and more personalised educational pathways (Selwyn, 2016). This movement accelerated dramatically during the COVID-19 epidemic, when schools and universities around the world were forced to adopt online and hybrid learning approaches. The abrupt change exposed significant disparities in access to technology and digital skills, emphasising the importance of developing inclusive and sustainable digital education systems (UNESCO, 2020). As a result, there is a rising emphasis on improving educators'

digital competency, rethinking curricula to meaningfully include technology, and leveraging data-driven insights to improve educational quality and outcomes (Kiryakova and Kozhuharova, 2024).

Digital transformation represents far more than simply digitising textbooks or classrooms; it calls for a fundamental reimagining of pedagogy. It encourages educators to foster greater engagement, adaptability, and innovation in their teaching, ensuring that learners are equipped to thrive in a world shaped by rapid technological advancement. The new digitalised conditions collectively raise the quality standard for teacher education (TE) in terms of educating and preparing student teachers to handle the evolving demands of new technologies in their classrooms (Livingstone, 2016; McGarr and McDonagh, 2019). Thus, it is the significant duty of teacher education institutions and teacher educators to create learning environments that will support student teachers in achieving the necessary high levels of professional digital competence (Lund et al., 2014) viewed as essential for instruction in tomorrow's classrooms (Baran et al., 2019; Tomte et al., 2013; Tondeur et al., 2017).

Digital competence is important for educators, as it relates to technological, informational, multimedia, and communication skills, and can help overcome gender gaps (Esteve-Mon et al., 2020). Digital competence is important to teachers as it allows them to use technology purposefully and reflectively to create new knowledge, overcome difficulties of mastery and appropriation (Instefjord, 2014). Teacher educators have a powerful intermediary role as gatekeepers of the incoming generation of educators with

regard to the opportunities that build the skills necessary to be an effective teaching and learning practitioner in the 21st-century educational landscape (Tondeur et al., 2019).

Theoretical Perspectives

By considering the effect of digital competence on teacher educators' pedagogical practices, it is important to give effective theoretical frameworks around how technology is used mathematically into educational practice. This study is based upon two theoretical frameworks. Firstly, the Technological Pedagogical Content Knowledge (TPACK) framework and the SAMR model (Substitution, Augmentation, Modification, Redefinition). These theories provide a systematic framework for analysing and understanding the digital practices of teacher educators.

Technological Pedagogical Content Knowledge (TPACK)

Mishra and Koehler (2006) developed the TPACK framework as an expansion of Shulman's (1986) concept of Pedagogical Content Knowledge (PCK), adding Technological Knowledge (TK) as a third need. In TPACK, technology is a relevant and necessary component of empirical and effective instruction. As a result, TPACK assumes that knowing the complexities of the three types of knowledge listed below is required for effective technology-based education.

Content Knowledge (CK): Knowledge of the subject matter.

Pedagogical Knowledge (PK): Knowledge of the strategies and methods of teaching.

Technological Knowledge (TK): Knowledge of the various digital tools and platforms.

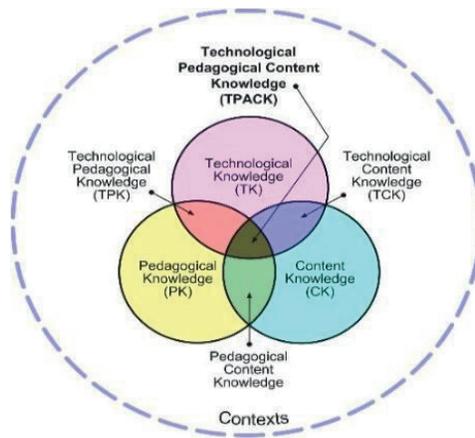


Fig. 1. TPACK Model (Mishra and Koehler, 2006) (source: <http://tpack.org>)

The centre of all three areas, TPACK is where digitally competent teaching occurs. This would be considered a relevant model for teacher educators, as it emphasises the need for educators to not only demonstrate technical competence but to also demonstrate pedagogy and content that incorporates that technology.

SAMR Model

The SAMR model, developed by Puentedura (2010), offers a hierarchical framework for understanding how technology can transform teaching and learning. The model consists of four levels:

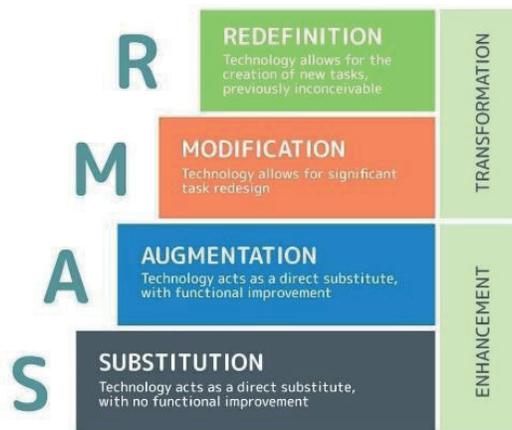


Fig. 2. The SAMR Model (Puentedura, 2010)

- **Substitution:** Technology acts as a direct tool substitute, with no functional change.
 - **Augmentation:** Technology acts as a substitute, but with functional improvements.
 - **Modification:** Technology allows for significant task redesign.
 - **Redefinition:** Technology enables the creation of new tasks previously inconceivable.
- The SAMR model is useful in evaluating the depth and impact of digital tool use in pedagogy. This methodology can be used by teacher educators to reflect on and evaluate the quality of their technology integration,

progressing from simple substitution to transformative practices. In the context of digital competence, this approach allows instructors to comprehend and support higher-order technology integration that dramatically boosts student learning (Krumsvik, 2011).

Review of Related Literature

Digital Competence

Digital competence refers to the capabilities of using technologies or different digital devices effectively to retrieve, store, share and manage information for creating digital content and also to solve problems. It is one of the core skills of the individual for effective learning and importantly, to actively take part in the digital society. Digital content creation, problem solving, information and digital literacy, communication and collaboration, are the five key aspects of digital competence as stated in the European Commission DigComp 2.2 framework (Vuorikari et al., 2022). Digital competence is crucial because it allows individuals to actively participate and act in digital environments, and to keep pace with technologies that rapidly transform. While the DigComp 2.2 framework offers a comprehensive and policy-oriented conceptualisation of digital competence, it primarily frames digital competence as an individual capability and provides limited insight into how these competencies are translated into pedagogical practices, particularly within teacher education contexts.

The COVID-19 pandemic made clear the need for strong digital competencies in all areas. In the field of education, for example, teachers had to quickly change their practices to use online platforms, which meant developing digital competence was a crucial part of effective teaching and learning (Redecker, 2020). In relation to the work

environment, digital skills are crucial to remote working, to working digitally, collaborating digitally, managing information digitally. However, much of the literature emerging from this period emphasised technological access and emergency remote teaching, rather than empirically examining how variations in digital competence are associated with differences in pedagogical practices.

However, digital competence is not evenly distributed across all sectors. Variations in acquisition of digital skills can be explained in part by socioeconomic factors, age, education level, which contribute significantly to a widening digital divide (Van Deursen and Helsper, 2022). As such, the likelihood that any of these groups would benefit from Government policies and strategies focused on a digital engagement agenda should be targeted and include digital education to ensure inclusiveness. These disparities suggest that educators may possess differing levels of digital competence, which may in turn shape their pedagogical choices and classroom practices.

Even more, digital competence changes continuously and individuals need ongoing training and support to develop and maintain their capacity as technology develops. The Organisation for Economic Co-operation and Development (OECD) describe having skill, but also the ability to think critically and adapt to digital environments (OECD, 2021), as important. Thus, developing digital competence is a lifelong process, rather than a one-off event. It is clear that governments, education systems and employers all have a role to play to support individuals to gain and maintain continual support and skill development. Despite this recognition, empirical evidence remains limited regarding how digital competence relates to pedagogical

practices, particularly among teacher educators who play a crucial role in shaping future teachers' professional and instructional development.

Pedagogical Practices

Educators' pedagogical practices have changed over the years in response to emerging research in education, technology, and societal expectations. Overall, the modern pedagogical practices are increasingly emphasising a pedagogy built around the students. Student-centred pedagogy highlights increased learner autonomy, engagement, and collaboration with other learners; inquiry-based and project-based learning, are pedagogical approaches that can enable learners to think critically and problem solve (Bozkurt et al., 2023). While these approaches are widely advocated, the literature often describes them conceptually rather than empirically measuring how teachers implement them in practice, particularly in digitally mediated classrooms.

Along with these new pedagogical approaches, culturally responsive pedagogy is also a growing field. Culturally responsive pedagogy requires educators to consider students' cultural backgrounds as a pedagogical experience in the classroom, making learning more meaningful, inclusive, and ultimately impactful (Gay, 2023; Ladson-Billings, 2023). However, few studies examine how culturally responsive approaches intersect with technology integration or how teacher educators operationalise these approaches in their professional practice. This leaves a gap in understanding the relationship between pedagogical philosophy and digital competence.

Technology is also positively changing the pedagogical practices of educators today. There are many digital tools to choose from, including learning

management systems (LMS) and tools such as AI tutors and adaptive learning applications that support increased personalisation, choice flexibility, and allow for real-time assessment, allowing for differentiated instruction for learners when pedagogical methods are being implemented. Teachers must develop their digital competence to effectively practice digitally based pedagogy (Salmon and Eib, 2024). Despite the availability of these tools, research indicates that the mere presence of technology does not guarantee effective pedagogical integration. There is limited empirical evidence on how variations in teachers' digital competence influence the quality and effectiveness of technology-mediated teaching.

Assessment has a growing emphasis on formative practices; formative assessments support continuous learning and inform instruction. Peer feedback, teacher feedback, and self-assessment contribute to students becoming co-participants in their learning (Wiliam, 2023). Current approaches to practicing education also have social-emotional learning (SEL) as an integrated part of a more holistic experience. SEL is about developing emotional intelligence, resilience, and communication skills, which are important for academic and personal success. Research indicates that effective programs allow for SEL to "stay but be invisible" in the student learning experience while also improving the overall experience of the classroom for the students both socially and academically (Jones et al., 2023). However, there is a gap in linking SEL integration with teachers' digital competence and how it affects pedagogical practice, particularly in higher-level teacher education contexts. Generally, the pedagogical practices effective for 21st Century Learning are dynamic, inclusive, and responsive to the needs of diverse learners in an

ever-evolving world. Yet, despite these insights, the literature largely remains descriptive, and there is a need for empirical studies that examine how teacher educators' digital competence shapes their adoption of innovative, student-centred, and culturally responsive pedagogical practices.

Relationship between digital competence and pedagogy

Pedagogical digital competence is the continuous skill of using ICT for teaching and assessment. Teachers rely on theory, research, and experience to help students learn (Spante et al., 2018). Digital competence is the use of ICT in a professional context it is a trainer's recognition of pedagogical-didactic considerations on learning models and methodology, and how ICT impacts students' digital development (Krumsvik, 2011). Teachers' digital competence is known as pedagogical-didactic knowledge, reasoning, and work of their knowledge, skills, and attitudes and understanding of educational technology in practice (Lázaro-Cantabrana et al., 2019). Digital competence is to evaluate and make selections of digital resources, appropriate adaptations needed in instructional practices to utilise technology and cultivate students' digital literacy (Kiryakova and Kozhuharova, 2024). While these definitions emphasise the technical and pedagogical dimensions of digital competence, the literature often treats these dimensions independently rather than examining how they collectively influence actual classroom practices, particularly among teacher educators.

Teachers' adoption of digital technology in the classroom requires shifting practices away from traditional practice and integrating them into more integrated practice (Pettersson, 2018). The relationship between digital

competence and pedagogy is important in modern education with the increased recognition of technology in teaching and learning. Digital competence is how an educator uses digital tools, platforms, and resources to augment learning. It develops the different skills among teacher educators, such as skill to manage digital classroom environment, practising technology-based pedagogy and evaluating digital content (Redecker and Punie, 2023). However, empirical studies that systematically explore how variations in digital competence predict differences in pedagogical practices are limited. Much of the existing research relies on conceptual discussion or self-reported data rather than regression-based or observational evidence. In this way, proper integration of technology into the teaching-learning process is required to practice effective pedagogy in this digitally-focused education system. For which, it is very much essential for the teacher educators and also the teachers to develop their digital competence so, they can embrace students' learning by applying innovative and technology-based pedagogy (Instefjord and Munthe, 2023). It enhances students' engagement and also promotes meaningful learning among them. Without a good sense of digital skills, an educator could possibly under-utilise or use technology in a superficial or ineffective way which can hinder learning. This underscores the importance of continuous professional development (CPD). While CPD programs exist to reskill and upskill teachers (Engen, 2023), research gaps remain in understanding how CPD effectively translates into measurable improvements in pedagogical practices mediated by digital competence. As unified, continuous professional development is critical for this reason. These CPD program helps the teachers to reskill and upskill themselves with the present vision of education for students'

academic success (Engen, 2023). While theoretical frameworks recognise the integration of digital competence into pedagogy, quantitative evidence on its predictive relationship with actual teaching practices among teacher educators, particularly in resource-constrained or non-Western contexts, remains scarce. Addressing this gap is essential to understanding how digital competence can enhance teaching effectiveness and inform professional development programs. While existing frameworks such as DigComp and pedagogical models provide strong conceptual foundations, there remains limited empirical evidence examining how digital competence is statistically associated with pedagogical practices among teacher educators. The present study addresses this gap by offering exploratory quantitative evidence using descriptive statistics, correlation, and regression analysis, thereby contributing modest but contextually relevant insights to the existing literature.

Rationale of the Study

Digital competence is now widely recognised as an essential skill set for all educators. It includes not only the technical capacity to use digital technologies, but also the pedagogical, ethical, and critical understanding needed to successfully and ethically incorporate these tools into a variety of educational settings (Baran et al., 2019; Lund et al., 2014). The modern pedagogical practices are increasingly emphasising a pedagogy built around the students. Student-centred pedagogy highlights increased learner autonomy, engagement, and collaboration with other learners; inquiry-based and project-based learning, are pedagogical approaches that can enable learners to think critically and problem solve

(Bozkurt et al., 2023). Analysis of previous research found that the majority of research conducted on the pedagogical practices of college teachers and few studies on the pedagogical practices of teacher educators at teacher education institutions in India, and also in Odisha. In the context of teacher education, establishing professional digital competence in student instructors is crucial for equipping them to face the problems of modern classrooms. Further, teacher education institutions and educators must thus establish learning environments that foster the development of these competencies, allowing future teachers to confidently help students' learning in a digitally mediated world (Livingstone, 2016; McGarr and McDonagh, 2019). Many research studies indicate that teachers who are not as proficient in digital competences find it challenging to include digital tools into their regular lesson plans (Amhag et al., 2019; Silva et al., 2019). The present study plays an important role since it examines the relationship between digital competence and pedagogical practices of teacher educators. Considering this research gap the present is undertaken on the influence of digital competence of teacher educators on their pedagogical practices.

Objectives of the Study

1. To assess the level of digital competence among teacher educators.
2. To study the relationship between digital competence and pedagogical practices among teacher educators.
3. To study the impact of digital competence on the overall pedagogical practices of teacher educators.

Hypothesis of the Study

1. There is no significant relationship between digital competence and pedagogical practices among teacher educators.
2. There is no significant impact of digital competence on the overall pedagogical practices of teacher educators.

Methodology

Research Design

The present study adopted a descriptive-correlational research design to examine the predictive relationship between digital competence and pedagogical practices among the teacher educators. The design is exploratory in nature and aimed to identify the associative patterns rather than the established causal relationships, and the findings are interpreted in terms of prediction rather than the causal influence.

Population of the Study

The population of the present study included all the teacher educators of Odisha who are working in the District Institutes of Education and Training (DIETs) under the State Council of Educational Research and Training (SCERT), Govt. of Odisha.

Sample of the Study

A total of 100 teacher educators were selected as a sample through a multi-stage sampling technique from all 30 District Institutes of Education and Training (DIETs) across Odisha to ensure institutional representation. In the first stage, all 30 DIETs were included. In the second stage, teacher educators were selected proportionately from these institutions based on availability and willingness to participate.

Research Tools

In this study, two Likert Scales were used to collect data. One was the Pedagogical Practices scale with 24 items, and the other was the Digital Competence Scale with 60 items. The Pedagogical Practices Scale (self-developed) showed a reliability score (Cronbach's alpha) of 0.932, which shows high reliability, and it was used to measure four dimensions such as Content of Pedagogical Practices, Impact of Pedagogical Practices, Barriers and E-content, and Module Development. The Digital Competence Scale of Ergul and Tasar (2023) was used to measure the following dimensions: Professional Engagement, Digital Resources, Teaching and Learning, Assessment, Empowering Learners, and Facilitating Learners' Digital Competence. It also showed a high reliability score of 0.944. Both scales used a 5-point Likert scale for responses: Strongly Agree (5), Agree (4), Neutral (3), Disagree (2), and Strongly Disagree (1). The tools were considered reliable since the reliability scores were both above 0.80.

Procedure

The researchers administered the scale to a sample of 100 teacher educators. Permission was taken from the principals of the District Institutes of Education and Training (DIET) institutions. The investigator was personally present during the administration of the scale. Later, the responses given by the teacher educators were collected and processed according to the predefined scoring procedures.

Statistical Techniques

The collected data were analysed using descriptive statistical procedures (mean and standard deviation), besides

inferential statistical methods such as Pearson correlation and linear regression analysis.

Limitations of the Study

The present study was delimited to digital competence and pedagogical practices of teacher educators. This study was delimited to teacher educators working in DIETs of Odisha only. This study was delimited to permanent teacher educators working in DIETs only.

Analysis and Interpretation of the Data

i. The level of digital competence among teacher educators

In the present study, the objective was to assess the level of digital competence among teacher educators. The mean and standard deviation were calculated using SPSS-22 to analyse the digital competence level, and the results are given in Table 1.

Table 1. Descriptive statistics of digital competence among teacher educators

Digital Competence	N	Minimum Possible Score	Maximum Possible Score	Mean	Standard Deviation	Minimum Obtain Score	Maximum Obtain Score
	100	60	300	186.0200	29.1408	61	295

From Table 1, the results revealed that the digital competence scores among teacher educators ranged from 61 to 295. These scores represent the lowest and highest levels of digital competence reported by the respondents, which indicate a wide variation in their digital preparedness. It shows that the mean score of digital competence among teacher educators is 186.02, with SD 29.14. As they obtained scores between 61 to 295, this indicates that there is a moderate level of variability among the digital competence scores. Further, it can be said that

most of the teacher educators have a moderate level of digital competence. The findings suggest that many teacher educators are digitally competent.

ii. The relationship between digital competence and pedagogical practices among teacher educators

The objective was to study the correlation between digital competence and pedagogical practices among teacher educators. The data were analysed with the help of Pearson’s product-moment using SPSS-22, and the results are given in Table 2.

Table 2. Correlation between digital competence and pedagogical practices of teacher educators

Digital Competence	N	Mean	SD	R	p-value	Remark
	100	186.0200	29.1408	0.305	<0.05	Moderate Positive Correlation
Pedagogical Practices	100	64.1111	6.56136			

Based on the data in Table 2, it is evident that the correlation

coefficient between Digital Competence and Pedagogical

Practices is 0.305, which indicates a positive and statistically significant correlation with 48 degrees of freedom. Thus, the null hypothesis, which proposed that there is no significant correlation between digital competence and pedagogical practices of teacher educators, is rejected. It indicates that when teacher educators' digital competence increases, on the other hand, the pedagogical practices of teacher educators also increase. Overall, the results indicate a moderate, statistically significant positive correlation

between digital competence and pedagogical practices among teacher educators.

iii. The impact of digital competence on The overall pedagogical practices of teacher educators

Regression analysis was performed to ascertain the actual level of influence of teacher educators' digital competence on pedagogical practices. Digital Competence and Pedagogical Practices of teacher educators' data were computed from the Likert scale.

Table 3: Model summary on teacher educators' digital competence on pedagogical practices

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1.	0.305	.093	.074	6.31365
Predictors: (Constant), Teacher Educators' Digital Competence				
Dependent Variable: Teacher Educators' Pedagogical Practices				

The results in Table 3, revealed that digital competence is positively correlated with Pedagogical Practices among teacher educators at DIET (n=100; r=0.305; p<.05), with increased digital competence associated with a rise in continuous professional development. Further, the model summary shows that teacher educators' digital competence

accounted for 9.3% (Adjusted R²= .074) of the teachers' pedagogical practices. This finding implies that the digital competence accounts for 9.3% of the variance in explaining pedagogical practices among teacher educators, and other factors are likely contributing significantly to pedagogical practices as well.

Table 4. ANOVA- Influence of Teacher Educators' Digital Competence on Pedagogical Practices

Model	Sum of Squares	Df	Mean Square	F	Sig.	
1.	Regression	196.135	1	196.135	4.920	.031b
	Residual	1913.385	98	39.862		
	Total	2109.520	99			
Dependent Variable: Teacher Educators' Pedagogical Practices						
Predictor: (Constant), Teacher Educators' Digital Competence						

The results in the above table indicate that teacher educators' digital competence is a significant impact on pedagogical practices of teacher educators [F (1, 98) = 4.920, p=.000<.05]. This indicates a statistically significant relationship between digital competence and pedagogical practices, meaning the regression model fits the data better than a model with no predictors. These results suggest that teacher educators with higher levels of digital competence are more likely to apply or demonstrate effective pedagogical

practices compared to those with lower digital competence. The significant F-test confirms that digital competence meaningfully contributes to explaining differences in pedagogical practices among teacher educators.

In this present study, the objective was to study the impact of digital competence on the overall pedagogical practices of teacher educators. The data were analysed with the help of linear regression and the results are given in Table 5.

Table 5. Linear Regression Analysis Showing the Impact of Digital Competence on the Pedagogical Practices of Teacher Educators

Model B		Unstandardised Coefficient		Standardised Coefficients	t	Sig.	% Contribution
		Std. Error	Beta				
1.	(Constant)	56.234	3.893	.305	14.444	.000	9.3%
	Teacher Educators' Digital Competence	0.044	0.020		2.218	.031	
Dependent Variable: Teacher Educators' Pedagogical Practices							

From Table No. 5, it is evident that the standardized beta coefficient for digital competence is 0.305, which is statistically significant at the 0.05 level (p = .031). This indicates that digital competence has a significant positive impact on the pedagogical practices of teacher educators. thus, the null hypothesis that there is no impact of digital competence on pedagogical practice of teacher educators is rejected. Since the Beta coefficient is positive, it indicates that Digital Competence positively impacts the Pedagogical Practices of Teacher Educators. Also, the R-squared value of 0.093 indicates that digital competence explains about 9.3% of the variance in pedagogical

practices, which demonstrates a modest but meaningful contribution. From the above analysis, it can be stated that the pedagogical practices of teacher educators is significantly influenced by their digital competence.

Results and Discussion

The study is based on digital competence and pedagogical practices of teacher educators. Analysis of the first objective indicates that the digital competence scores of teacher educators range from 61-295, the mean is 186.02 and the standard deviation is 29.14. It shows a moderate to high level of digital competence with considerable

variability among teacher educators (Kiryakova and Kozhuharova, 2024). Some of the teachers demonstrate high digital skills and on the other hand, some of the teacher educators are facing difficulties in integrating technology in their teaching-learning process. There was a significant positive correlation between digital competence and pedagogical practices of teacher educators, with a correlation coefficient value ($r = 0.305$, $p < 0.05$), indicating that the development of digital competence enhances pedagogical practices (Redecker and Punie, 2023). In relation to the TPACK framework, these findings indicated that the teacher educators who have higher technological knowledge are better able to integrate the content knowledge and pedagogical knowledge into effective technology-based instruction. Teacher educators showing a strong digital competence likely to operate at the TPACK intersection by combining the technology, pedagogy and content knowledge to enhance learning outcomes.

The regression analysis specifies that the digital competence of teacher educators accounts for 9.3% of the variance in their pedagogical practices. Further, the result also shows that digital competence has a significant impact on pedagogical practices. Here, some other factors also play a major role in facilitating their instructional practices (Engen, 2023). Applying the SAMR model, teacher educators' use of technology ranges from substitution or augmentation (basic integration) to modification and redefinition (transformative practices), with those exhibiting higher digital competence more frequently engaging in modification and redefinition, thereby redesigning learning tasks and creating new opportunities for student engagement (Puentedura, 2010; Krumsvik, 2011). From the analysis, it is also clear that digital competence is a

significant predictor of the pedagogical practices of teacher educators (F ratio = 4.920, p value < 0.05). It means a high level of digital competence mostly influences pedagogical practices of teacher educators (Tondeur et al., 2019).

Overall, the study provides empirical evidence supporting the argument that digital competence significantly enhances teacher educators' pedagogical practices. By explicitly interpreting the results through TPACK and SAMR, it is evident that digital competence enables teacher educators to integrate technology more effectively into content and pedagogy and progressively transform learning tasks. While digital competence positively correlates with and impacts pedagogical effectiveness, there remains a need for continuous professional development to address disparities in digital preparedness. The findings advocate for integrating targeted digital training programs within teacher education to improve overall teaching efficiency in technologically rich learning environments (Kiryakova and Kozhuharova, 2024; Redecker, 2020).

Educational Implications

Institutions must prioritise continuous digital training for teacher educators to reduce variability in digital competence and enhance uniform teaching quality. Teacher education programs should embed digital pedagogy frameworks like TPACK and SAMR into their curriculum to support effective tech-enhanced instruction. Policymakers should allocate resources and infrastructure to support digital transformation in teacher education, particularly in under-resourced DIETs. Policymakers should allocate resources and infrastructure to support digital transformation in teacher education, particularly in under-resourced DIETs.

Limitations and Future Directions

The present study has some limitations that should be further acknowledged. The use of a self-developed scale may be subject to response bias. The study limits the generalisability of the findings due to the reliance on a relatively small sample size. This study is a cross-sectional and correlational design, which restricts the causal interpretation. Further study may be conducted on a larger and more diverse sample, mixed methods approach, and a longitudinal design to gain deeper explanatory information into the relationships between digital competence and pedagogical practices.

Conclusion

The study revealed that teacher educators possess a strong level of digital competence, which significantly enhances their pedagogical practices. The results, showing a clear and meaningful relationship, emphasise the importance of nurturing digital skills as an essential part of professional development in education. Although digital competence alone may not explain every aspect of teaching effectiveness, in today's classrooms. Moving forward, future research should explore other influencing factors such as institutional support, educators' attitudes toward technology, and access to digital infrastructure to gain a deeper and more holistic understanding of what shapes effective teaching in the digital age.

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