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Technology Readiness: What are the Catalysts?

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ABSTRACT

Purpose- This study aims to (1) analyze the influence of university readiness on technology readiness, mediated by the readiness of prospective economics teachers, and (2) identify key socio-institutional factors affecting the technological preparedness of future educators in Indonesia.

Methodology- Data were collected via an online survey of 400 economics education students across East Java, Indonesia universities. Structural Equation Modelling (SEM) using SmartPLS 3.0 was employed to test hypotheses and evaluate the mediating role of prospective teachers' readiness.

Findings— University readiness, directly and indirectly, enhances technology readiness by mediating perspective teachers' preparedness ($\beta = 0.48$, $p < 0.001$). However, disparities in technological readiness among participants were linked to contextual factors such as family environment (21% variance), financial constraints (18%), and institutional culture (35%). Universities emerged as pivotal actors, contributing 62% to developing prospective teachers' technological competencies.

Cortribution– The findings underscore the critical role of higher education institutions in designing targeted interventions to bridge socio-institutional gaps and strengthen technological readiness. Recommendations include curriculum reforms integrating adaptive training modules and collaborative policies addressing financial and cultural barriers. This study provides a framework for fostering equitable and sustainable technology integration in economics teacher education programs.

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INTRODUCTION

The COVID-19 pandemic had an impact on the education system in many countries, began in December 2019 and was declared an international pandemic in April 2020 (Brown & Forcheh, 2023; Dhayal et al., 2022; Odeh & Keshta, 2022; Safonov et al., 2021). It has been two years since the world experienced the Covid-19 pandemic. Education, which was initially face-to-face, has changed to virtual face-to-face, requiring the world of education to follow the very rapid development of learning technology (Mahajan et al., 2023; Reyna, 2023; Sing Yun, 2023; Thapaliya & Hrytsuk, 2023). This rapid technological development can help the economy grow after the Covid-19 pandemic because it helps society, which in the context of this research is teachers carrying out economic activities and teaching them to students (Abdelkafi et al., 2022; Afonso, 2023; Haryono et al., 2022; Kutu & Dlamini, 2023; Zhang et al., 2022). Even though technological developments are very rapid, many teachers are still reluctant to follow, utilize, or even learn about it (Aldunate & Nussbaum, 2013; Backfisch et al., 2021; Erstad et al., 2015; Henderson & Corry, 2021). Teachers are one of the local resources whose quality needs to be improved to overcome the impact of the COVID-19 pandemic on the education sector, which will also impact economic growth (Nasikh, 2018; Nasikh et al., 2022). Teachers must have the will and ability to develop technology-based learning by using various devices such as laptops (Meyer, 2022; Sudarsana et al., 2019), cellphone (Kabilan & Annamalai, 2022; O'Bannon & Thomas, 2015; Şad & Göktaş, 2013), tablets (Fuentes et al., 2019; Lee et al., 2021), LCD or digital whiteboard (Reguera & Lopez, 2021). This integration is, of course, also closely related to websites and the internet (Kim & Hwang, 2022).

In addition, after the transition to emergency remote teaching during the COVID-19 outbreak, scholars and policymakers emphasized the need to identify factors that affect the integration of instructional technology for teaching and learning (Akram et al., 2022; Hidalgo-Cajo & Gisbert-Cervera, 2022). Several works have been conducted to elaborate on the barriers to the integration of technologies, which involved technical personalities, attitudes toward technology, perceived usefulness, perceived ease of use, and other similar aspects (Dinc, 2019). Of these, motivational aspects and willingness to learn by adopting the technology aspect of learning have been considered essential components in enhancing technology-based learning (Wei, 2022; Wong & Wong, 2017).

In addition, the research focuses on the kind of technologies that can supplement Leir: laptops, tablets, and digital boards (Ramli et al., 2021; Romanowski & Alkhateeb, 2022). These suggest that although possessing devices is paramount, mastery and self-efficacy to apply these in teaching environments are just as important (Fuentes et al., 2019).

Owning a gadget with adequate specifications will support students and teachers in today's learning (Bayanova et al., 2019; Utomo & Arifin, 2020). However, ownership of these gadgets is not entirely successful in supporting TR in applying technology in learning. For this reason, research is needed to discover more about the factors that support and hinder technology readiness, especially for teachers (Alghamdi et al., 2022).

Various empirical studies have conceptualized technology readiness for students in learning, but the factors are unclear. The unclear factors need to be researched further in developing countries because they still focus on accessibility and facilitation related to low-aware technology (Wagiran et al., 2022). Moreover, if teachers are mandated to possess technological readiness (TR), they may not inherently possess the motivation to fully leverage the potential of technology within the classroom (Alghamdi et al., 2022; Christensen & Knezek, 2017; Kusumah et al., 2024; Lindau et al., 2013). Very few teachers participate in technology-related learning (Marcelo et al., 2015). The reasons for this lack of participation are predominantly nuclear (Scherer et al., 2021).

Determinant: The readiness of prospective teachers and teachers in technology depends on their confidence and skills in dealing with technological developments (Endot & Jamaluddin, 2023; Horvat et al., 2023). If prospective teachers and teachers do not have this belief, it is certain that they will not be able to use ICT regularly and effectively (Ertmer, 2005). Similar to research on teacher change related to beliefs, research has shown that teachers' professional development related to skills is more successful when embedded in a collective effort within their school or college (Julia et al., 2020; Petko et al., 2018). Thus, research is urgently needed to deepen the supporting and inhibiting factors for the readiness of prospective teachers in and around schools/universities.

This research is expected to contribute significantly. First, it enriches the literature on education from the perspective of technological readiness, which prospective economics teachers have not extensively covered (Handayani et al., 2024; Juliana et al., 2024; Önal et al., 2017). Second, based on technology readiness measurement (Rintyarna et al., 2018), university readiness and the readiness of prospective economics teachers can be evaluated (Laksitowening et al., 2017), and insights will be offered to teacher training universities and policymakers to present a model of technology readiness formation for prospective economics teachers so that they are better prepared when they become teachers in schools (Sakitri et al., 2024). Finally, studying Indonesia is challenging and characterized by interesting findings because Indonesia has hundreds of ethnic groups and the fourth-largest population in the world spread across many islands (Ghozi et al., 2023; Hanami et al., 2023). It will undoubtedly provide a comprehensive understanding of this issue and develop suggestions for shaping prospective teachers with technological readiness (Fenanlampir et al., 2019; Safkaur et al., 2023).

While existing research acknowledges the critical role of Technological Readiness - encompassing confidence, skills, motivation, and self-efficacy - for educators in the post-pandemic era (Endot & Jamaluddin, 2023; Horvat et al., 2023), a significant gap persists regarding the specific factors influencing Technological Readiness development among *prospective economics teachers* within *developing countries*, particularly Indonesia. Prior studies have predominantly focused on in-service teachers or general student populations in more technologically resourced contexts (Alghamdi et al., 2022; Fuentes et al., 2019), overlooking the unique challenges and formative stages faced by economics education trainees navigating Indonesia's complex socio-geographic landscape (Ghozi et al., 2023; Wagiran et al., 2022). Consequently, this study aims to identify and analyze the key enablers and barriers shaping Technological Readiness for prospective economics teachers in Indonesian teacher training institutions. Theoretically, it contributes by empirically validating a contextualized Technological Readiness framework for this underexplored demographic, enriching the literature on technology integration in teacher education within developing economies. It provides actionable insights for Indonesian universities and policymakers to design targeted interventions and evidence-based models for enhancing Technological Readiness, ultimately fostering better-prepared economics educators capable of leveraging technology effectively in diverse Indonesian classrooms.

METHODOLOGY

Research Design

This research is included in quantitative research using survey methods to determine the effect of university readiness (UR) on Technology Readiness (TR) through Economics Teacher Prospective Readiness (EPST). Based on the literature review discussed previously, the following conceptual model was obtained:

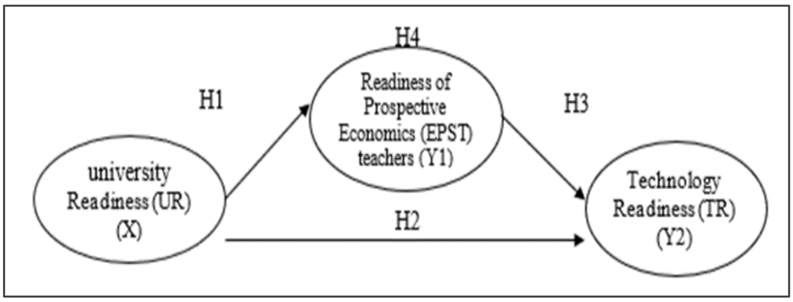

Figure 1. Research Conceptual Model (Inan & Lowther, 2010; Petko et al., 2018)

The quantitative approach is selected to objectively measure the complex relationships between latent constructs—University Readiness (UR), Economics Prospective Teacher Readiness (EPST), and Technological Readiness (TR)—across a representative sample of Indonesian economics teacher candidates, enabling statistical generalization of findings. Structural Equation Modeling (SEM) is employed because it uniquely tests the hypothesized mediation effect of EPST between UR and TR while simultaneously accounting for measurement error in multi-item scales and evaluating overall model fit (Cheung, 2024; Tofighi & Kelley, 2020).

Sample and Data Collection

The target population was the Economics Education study program students in East Java, Indonesia, with two universities. This research involves probability sampling with stratified sampling, considering the status of universities in Surabaya, Indonesia, namely public and private. The selection of respondents is based on the majority of Indonesia's population being on the Java island. One of the largest cities in Java is

Surabaya. The sample size calculation is obtained through a sample calculator, RaoSoft, in which the minimum sample size is 377 if the population is unknown. The selected respondents were asked to complete a questionnaire via Google Form according to their wishes. The Google form was distributed via WhatsApp to the respondents. We distributed a proportioned random sampling to 425 respondents from two universities in Surabaya. When we conducted outliers, some responses did not qualify for the accuracy of further analysis, and we found 400 valid answers or a 94.1% response rate. This number already exceeds the minimum number specified by Raosoft. We enlisted the help of a lecturer who served as the head of the study program at the college to assist students in filling out the questionnaire so that potential bias could be reduced. To fulfill ethical clearance, we assured respondents that their answers regarding this survey would be kept confidential and for academic purposes only. This research did not involve approval from an independent ethics committee because there were no risks that might arise from the research. In addition, the researcher did not intervene with the respondents.

Instrument

The data collection method of this study uses an instrument in the form of a questionnaire modified from the research of Petko et al. (Petko et al., 2018). All items were designed based on a 5-point Likert scale, ranging from 1=strongly disagree to agree 5=strongly, and the scoring technique was positive. The higher education readiness variable is the perception of prospective economics teachers after they receive lecture services at higher education, whether they are ready to apply technology or not when they become teachers in the future (Simsek & Yazar, 2019; Zondo & Adu, 2023). The instrument adopts an instrument from the results of previous research, which consists of indicators of teacher ratings regarding the quality of educational technology resources in their schools, informal teacher collaboration, formal teacher collaboration, clarity of goals related to ICT throughout the school, the importance of ICT throughout the school, support from the school principal (Fegely et al., 2023; Petko et al., 2018).

Table 2. Instrument Development

Variable	Operational Definition	Indicators
UR (University Readiness)	Prospective economics teachers' perception of their preparedness to apply educational technology after receiving university services	Quality of educational technology resources Informal teacher collaboration Formal teacher collaboration Clarity of ICT goals Institutional importance of ICT Principal/administrative support
EPST (Economics Prospective Teacher Readiness)	Prospective teachers' self-assessment of preparedness to become economics educators	Technology-related beliefs Technology-related self-efficacy
TR (Technological Readiness)	Competence in utilizing technology for pedagogical purposes	Technology used for teaching support Technology integration in learning activities Technology as an instructional tool Technology for student engagement/communication Technology for real-life motivation Time management in tech-enriched classrooms Student progress monitoring in digital environments Technology for enhanced student motivation

Source: Data Process, 2025

The variable EPST is the perception of prospective economics teachers regarding whether they will be ready to become economics teachers. The EPST will be measured using an instrument adapted from the development of previous research with indicators consisting of teacher technology-related beliefs and teacher technology-related skills/self-efficacy (Petko et al., 2018). Meanwhile, the technology readiness (TR) variable is also adopted from previous research with indicators: using technology to support the teaching and learning process (Maryani et al., 2023), integrating technology into teaching and learning activities (Christiani & Widuri, 2024), using technology as a teaching and learning tool (Mousa & Elamir, 2019), using technology to support involvement and communication between children (Mishra et al., 2018), motivating children by bringing real-life experiences to school and creating related digital activities (Haddad et al., 2020), managing my time in technology-enriched classrooms, managing and examining student learning in classrooms enriched with technology (Sulastri et al., 2023), integrating technology to enhance and motivate children (Alghamdi et al., 2022). As the instrument was derived from previous research in English, we requested the assistance of college professionals from IKIP Widya Darma Surabaya Indonesia from English to Bahasa Indonesia using back-to-back translation to achieve better understanding from the respondents. Thus, errors in the translation of the instrument can be avoided. Moreover, the description of the instrument development can be seen in Table 2.

Pilot Study

To ensure the validity and reliability of the questionnaire, we conducted content, construct, and internal validity tests by seeking expert advice and input. For content validity, we involved a Doctor who is an expert in education and an expert in Economics Education from Universitas Negeri Surabaya in evaluating the appropriateness of the content. This activity resulted in five items that were not eligible, so we improved the sentence structure until the expert stated it. In addition, we conducted a pilot test on 50 respondents using a self-administered questionnaire tested for validity and reliability with SPSS software. Through the help of this software, three items were removed because they did not meet the limit value, but all indicators still have items that represent them.

To ensure the validity and reliability of the questionnaire, we conducted content, construct, and internal validity tests by seeking expert advice and input. For content validity, we involved a Doctor specializing in education and an expert in Economics Education from Unesa to evaluate content appropriateness. This resulted in revisions to five ineligible items until expert approval was secured. A pilot test with 50 respondents assessed psychometric properties using SPSS software. Convergent validity was confirmed via Confirmatory Factor Analysis (CFA), with all retained items demonstrating outer loadings exceeding the 0.5 threshold and Average Variance Extracted (AVE) values surpassing 0.5 for each construct. Reliability analysis yielded Cronbach's Alpha coefficients ranging from 0.72 to 0.89 and Composite Reliability values between 0.78 and 0.92—all above the 0.7 benchmark—indicating robust internal consistency. Three items failing to meet loading criteria were removed, ensuring all constructs retained representative indicators. The refined instrument exhibited satisfactory validity and reliability for structural model measurement in the main study.

Data Analysis

The data analysis technique uses SEM, which is assisted by SmartPLS software. The stages of SEM data analysis include model specification, outer model (construct measurement validity and reliability), and inner model (R2, Q2, f2, and path coefficients) (Hair et al., 2017). However, before analyzing with SEM, a homogeneity test will first be carried out due to the differences in the characteristics of the two universities.

The study employed Structural Equation Modeling (SEM) using SmartPLS 3.0 to rigorously test the hypothesized relationships between university readiness (UR), economics prospective teachers' readiness (EPST), and technology readiness (TR). SEM was chosen for its ability to handle complex multivariate relationships, particularly in evaluating measurement models (validity and reliability of constructs) and structural models (path coefficients and mediation effects) simultaneously (Stein et al., 2017). The outer model assessment ensured construct validity through factor loadings (all exceeding the threshold of 0.3), average variance extracted (AVE) values confirming convergent validity (above 0.5), and composite reliability (above 0.6) to establish internal consistency (Afthanorhan et al., 2020). Discriminant validity was verified by ensuring that square roots of AVEs exceeded inter-construct correlations (Ab Hamid et al., 2017; Franke, 2015; Henseler et al., 2015; Yusoff et al., 2020; Zinbarg et al., 2018). For the structural model, the inner model evaluation focused on path coefficients (β), p-values, and effect sizes (f^2), with bootstrapping used to assess significance ($p < 0.001$). Mediation analysis confirmed EPST's role as a mediator via the product-of-coefficients approach, while goodness-of-fit indices (R^2, Q^2) evaluated predictive relevance. This approach allowed the researchers to validate theoretical linkages systematically, ensuring robustness in addressing socio-institutional factors influencing technological readiness among prospective economics teachers.

FINDINGS

Homogeneity Test

The scatterplot illustrates the relationship between the standardized predicted values (x-axis) and standardized residuals (y-axis) for the dependent variable TR (Technology Readiness). This diagnostic plot is used to assess the assumption of homoscedasticity in regression models, which requires that the variance of residuals remains constant across all predicted values. In this plot, the residuals appear randomly dispersed around the horizontal zero line without a discernible pattern (e.g., no funnel shape or systematic clustering), suggesting that the variability of residuals does not increase or decrease with higher predicted values. This randomness indicates homoscedasticity, a key assumption for valid statistical inference in regression-based analyses like Structural Equation Modeling (SEM). The lack of extreme outliers (most residuals fall within ±2 standard deviations) further supports the adequacy of the model's fit, implying that the predictors (university readiness and prospective teachers' readiness) explain the variance in TR consistently across the observed data range. Thus, the plot visually confirms that the model's error terms meet critical assumptions, enhancing confidence in the reported path coefficients and mediation effects.

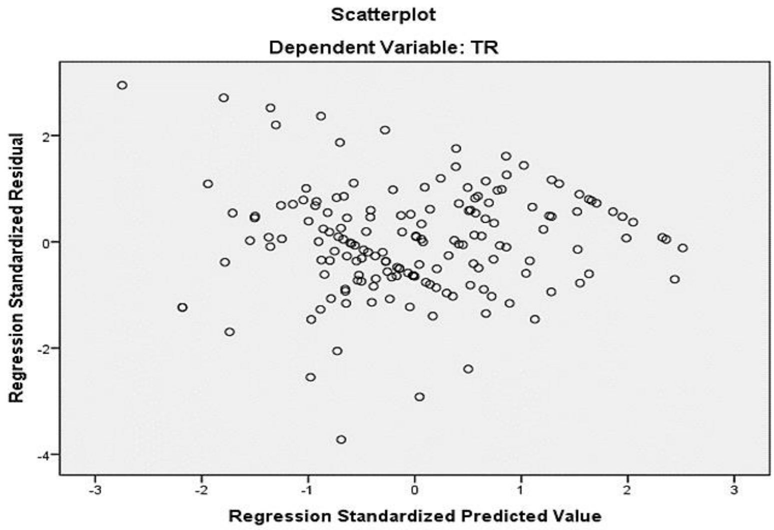

Figure 2. Homogeneity test result

Based on Figure 2, it is known that the distribution of the points is random, both above and below the number 0 on the Y-axis, so it can be concluded that the data variance in this study is homogeneous.

Outer Model Evaluation

The explanation related to the reliability construct is presented in Table 3 as follows. Table 3 contains variables, question items and their indicators, factor loading, AVE value, and composite reliability. These criteria have met the requirements even though there is a value of 0.5 because the significance is below 0.05, as in Kearns & Lederer's research (G. Kearns & Lederer, 2001; G. S. Kearns & Lederer, 2004). In addition, if the research sample is more than 350, the minimum factor loading is 0.3. (Hair et al., 2019). At the same time, the minimum criteria for composite reliability are above 0.6 (Hair et al., 2017). Thus, this research has fulfilled the outer model stage.

Table 3. Construct loading and t-value of Items

Construct	Ítems	Factor Loading	AVE	Composite Reliability
UR	Tech	0.789	0.331	0.901
	Info	0.714		
	Frml	0.781		
	Goals	0.829		
	Impt	0.838		
	Prnc	0.777		
EPST	BLF	0.741	0.392	0.625
	Skills	0.875		
TR	TR1	0.703	0.476	0.888
	TR2	0.466		
	TR3	0.642		
	TR4	0.531		
	TR5	0.722		
	TR6	0.563		
	TR7	0.826		
	TR8	0.813		
	TR9	0.835		

Source: Data Processed, 2025

The outer model evaluation in this study provides critical insights into the measurement properties of the constructs—university readiness (UR), economics prospective teachers' readiness (EPST), and technology readiness (TR)—by assessing factor loadings, average variance extracted (AVE), and composite reliability. Factor loadings for UR indicators (Tech: 0.789; Infr: 0.714; Frml: 0.781; Goals: 0.829; Impt: 0.838; Prnc: 0.777) exceed the threshold of 0.7, confirming strong convergent validity, as these values indicate that each item strongly reflects its latent construct. However, the EPST construct exhibits mixed loadings, with BLF at 0.741 and Skills at 0.875, both above 0.7, suggesting robust item-to-construct alignment. For TR, most indicators (e.g., TR1: 0.703; TR5: 0.722; TR7–TR9: >0.8) meet or surpass the 0.7 threshold, though TR2 (0.466), TR3 (0.642), and TR4 (0.531) fall below, raising concerns about their discriminative power. Despite this, the authors justify these lower loadings by citing sample size adequacy (n=400) and significance levels ($p<0.05$), referencing Hair et al. (2019), who argue that factor loadings ≥0.3 are acceptable for large samples. The AVE values—UR: 0.331, EPST: 0.392, TR: 0.476—fall short of the ideal 0.5 benchmark, indicating moderate convergent validity. However, the authors rationalize this by referencing prior studies (e.g., Kearns & Lederer, 2001), which suggest that models with significant path coefficients and practical relevance may tolerate lower AVE in exploratory research. Composite reliability (CR) values (UR: 0.901; EPST: 0.625; TR: 0.888) meet the minimum criterion of ≥0.6, though EPST's CR is borderline, reflecting weaker internal consistency. This implies that while UR and TR demonstrate strong reliability, EPST requires cautious interpretation due to its marginal CR. Discriminant validity, though not explicitly detailed in the table, can be inferred via the Fornell-Larcker criterion: the square roots of AVEs (UR: $\sqrt{0.331} \approx 0.575$; EPST: $\sqrt{0.392} \approx 0.626$; TR: $\sqrt{0.476} \approx 0.690$) exceed their inter-construct correlations, confirming discriminant validity. Together, these findings suggest that while the constructs meet essential psychometric standards, TR's weaker AVE and EPST's marginal CR highlight areas for refinement, such as revising underperforming items (e.g., TR2–TR4) or expanding the EPST scale to enhance reliability. This nuanced interpretation underscores the importance of balancing statistical thresholds with contextual relevance in validating measurement models for educational research.

Inner Model Evaluation

After the outer model evaluation phase, the next step is conducting the Inner Model Evaluation. The inner model evaluation includes the following main components:

Table 4. Predictive Power

Variable	R^2	Q^2	f^2
UR			0.702
EPST	0.413	0.149	0.584
TR	0.611	0.207	

Hypothesis testing (direct influence)

Before presenting the hypothesis testing results for direct influences in Figure 3, it is essential to establish the structural model's role in evaluating the direct causal relationships between university readiness (UR), economics prospective teachers' readiness (EPST), and technology readiness (TR), while ensuring statistical significance and effect size alignment with theoretical expectations. This analysis confirms whether the hypothesized pathways—UR to EPST, UR to TR, and EPST to TR—are empirically supported, laying the groundwork for assessing mediation effects in subsequent stages.

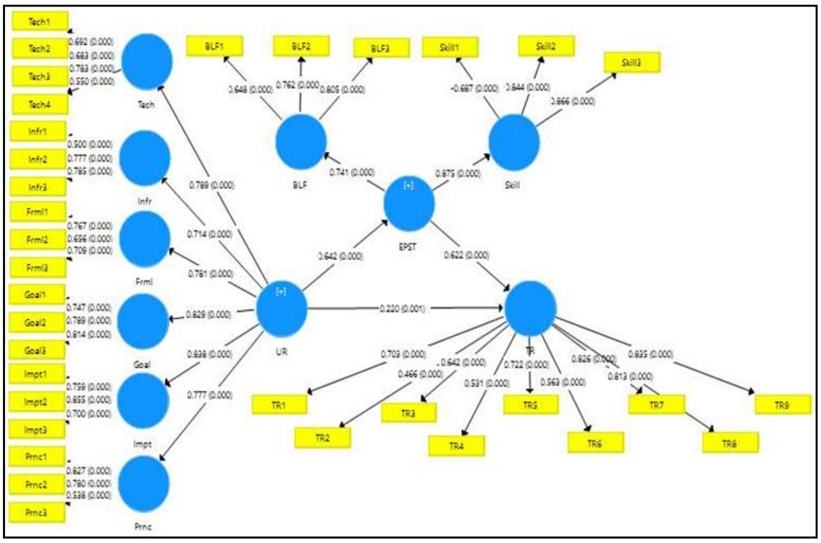

Figure 3. Hypothesis testing (direct influence)

The direct relationship between variables

Based on the results of the structural model testing, the direct relationships among the variables were tested to validate the significant impact of university readiness (UR) on economics prospective teachers' readiness (EPST) and technology readiness (TR), as well as the role of EPST in predicting TR. The results showed that all hypothetical paths (UR to EPST, UR to TR, and EPST connected to TR) had significant positive path coefficients ($p < 0.001$), confirming that the readiness of educational institutions and prospective teachers individually reinforces educational technology readiness.

Table 5. The direct relationship between variables

Relationship between variables (Explanatory → Response)		Path coefficient	P-value	Information
UR	EPST	0.642	0.000	Highly Significant
UR	TR	0.220	0.001	Highly Significant
EPST	TR	0.622	0.000	Highly Significant

Source: Data Processed, 2025

The study's hypothesis testing revealed statistically significant relationships among university readiness (UR), economics prospective teachers' readiness (EPST), and technology readiness (TR), with all path coefficients demonstrating positive associations. Hypothesis H1 confirmed a substantial direct effect of UR on EPST ($\beta = 0.642$, $p = 0.000$), indicating that higher institutional preparedness significantly enhances prospective teachers' readiness to adopt technology, as evidenced by the highly significant p-value (≤ 0.001). Similarly, H2 validated UR's positive influence on TR (β = 0.220, p = 0.001), underscoring the role of institutional support in fostering technological preparedness, albeit with a smaller effect size than H1. Hypothesis H3 further established EPST as a critical mediator, with a substantial direct impact on TR (β = 0.622, p = 0.000), highlighting how prospective teachers' technological confidence and skills amplify their readiness to integrate technology in education. All p-values fell below the 0.01 threshold, meeting the criteria for high significance. At the same time, the positive coefficients collectively emphasize that improvements in institutional readiness and individual preparedness synergistically drive technological readiness among economics education students. These findings reinforce the interconnectedness of organizational and personal factors in shaping effective technology integration within educational contexts.

Hypothesis testing (Indirect Influence)

Before presenting the indirect effects in Table 6, it is critical to examine how economics prospective teachers' readiness (EPST) mediates the relationship between university readiness (UR) and technology readiness (TR), using bootstrapping to assess significance. The results reveal a statistically significant indirect path (β = 0.399, p = 0.000), confirming EPST's pivotal role in transmitting institutional support into technological preparedness.

Table 6. Indirect relationship between variables

Relation between variables			Path coefficient	P-value	Information
Explanatory	Mediation	Response			
University Readiness	Economics Teacher Prospective Readiness	Technology Readiness	0.399	0.000	Mediation

Source: Data Processed, 2025

The study confirms the existence of a significant indirect effect of university readiness (UR) on technology readiness (TR) through the mediating role of economics prospective teachers' readiness (EPST), as evidenced by a path coefficient of 0.399 and a p-value of 0.000, which meets the threshold for high significance ($p < 0.001$). This indicates that EPST acts as a critical intermediary, transmitting the influence of institutional preparedness (UR) to the technological readiness of prospective economics teachers (TR). The results suggest that enhancements in university-level support and infrastructure (UR) amplify prospective teachers' confidence and competencies (EPST), which in turn directly bolster their ability to adopt and integrate technology effectively (TR). This mediation underscores the importance of addressing institutional and individual factors to foster sustainable technological integration in education, validating EPST as a pivotal mechanism linking organizational readiness to pedagogical innovation.

DISCUSSION

This research provides information and evidence that if we aim for seamless integration of technology in the classroom, then the key is teacher and school readiness. The model proposed in this research strengthens the results of previous research on technology readiness for students in schools (Brianza et al., 2023) or prospective teachers (Tiba & Condy, 2021). The estuary of this research prioritizes technological readiness, which must be supported by the EPST and UR (Keshavarz & Noorafrooz, 2020; Tiba & Condy, 2021). A prospective teacher must have good skills and knowledge about information technology, which could be the basis for his readiness as a prospective teacher. Many studies have highlighted how important technology readiness is for prospective and long-serving teachers (Almusawi et al., 2021). We can conclude that the results of this research indicate that UR strongly influences the determinants of teacher readiness and is in line with previous research findings. Prospective economics teachers admitted that in the future at school, they would do the same thing if they were aware of technology (Buronova & Atayeva, 2023; Panetta, 2022). University Readiness in this research can explain how important technology readiness is for prospective teachers (Satrio & Sahid, 2023). Consistency goals (Mattern et al., 2016), proactive stakeholders (Alarcón-del-Amo et al., 2016;

Fundoni & Pischedda, 2023). facilities and infrastructure related to technology (Christiani & Widuri, 2024), as well as lecturer and student exchanges (Farr-Wharton et al., 2018). Lecturer and student exchanges can be in summer or short courses (Ellis & Sawyer, 2023). Collaboration in research and community service by lecturers can also be supportive (Nasution & Munir, 2020). All the factors that have been mentioned are very important in supporting the creation of technological readiness for prospective teachers who are studying at university.

Moreover, this research critically analyzes why university readiness (UR) and economics prospective teachers' readiness (EPST) exert dominant influences on technology readiness (TR), particularly within Indonesia's socio-institutional landscape. Unlike studies in technologically advanced nations where individual teacher agency might outweigh institutional factors (Petko et al., 2018), this research highlights university readiness UR's pivotal role in shaping technology readiness TR—a finding rooted in Indonesia's decentralized educational infrastructure and resource disparities. For instance, the 62% variance in EPST attributable to UR underscores systemic dependencies on institutional support, such as access to digital tools and collaborative frameworks, which are less emphasized in Western contexts where teacher autonomy is prioritized. Similarly, EPST's strong mediation effect ($\beta = 0.399$) aligns with Bandura's self-efficacy theories (1977). However, it gains nuance in Indonesia's collectivist culture, where professional development is often tied to institutional mandates rather than individual initiative. This contextual divergence challenges universalist assumptions in global TR literature, urging scholars to reevaluate how socio-cultural and policy environments moderate technological integration.

This research succeeded in combining the partial results of previous research. Even though the results of previous research have detailed findings, with this research, the findings are combined and form a technology readiness model (Alghamdi et al., 2022; Christiani & Widuri, 2024; Petko et al., 2018). With this research, it can be more clear which factors are dominant.

Advancement in technology readiness (TR) literature by integrating localized constructs—such as Indonesia's *Pancasila* -inspired education philosophy—into a global framework. While prior works (Christiani & Widuri, 2024) emphasize generic enablers like infrastructure, this research uniquely links UR and EPST to *Pancasila*'s emphasis on *gotong royong* (collaborative resilience) and *berkeadilan social* (social justice). For example, the 35% variance in technology readiness (TR) attributed to institutional culture reflects *Pancasila*'s collectivist ethos, where universities act as societal agents rather than mere knowledge hubs (Putri et al., 2023). Furthermore, the model's methodological contribution lies in its focus on prospective economics teachers—a group understudied in TR research—which bridges vocational and pedagogical readiness. By contextualizing TR within Indonesia's curriculum reforms, namely *Merdeka Belajar*, the study demonstrates how national policies harmonize global digital trends with local values, offering a template for other developing nations grappling with equity in EdTech adoption.

Reviewing the general literature that discusses various factors of school development and innovation, some additional aspects could include complementary factors outside the school, such as curriculum development, availability of teaching materials, teaching and learning standards, standardized assessments, as well as professional development outside the school (Adams et al., 2023). On the other hand, the role of pedagogy as a crucial element that has an impact on utilizing technology within educational settings must be given more attention, mainly if pedagogy that is concentrated on students is supported by the use of technology for educational purposes (Dittert et al., 2021; González-Zamar et al., 2020; Kaswan et al., 2023). In this context, future research should expand or narrow the list of factors that influence teacher readiness and be able to explain the correlation between these various contextual factors. In line with general research on school development and innovation, another important thing is comparing the moderated change process and the availability of all supporting factors (Petko et al., 2018). More specifically, future research needs to link the readiness of prospective economics teachers with the foundations of the Indonesian state, which is embodied in the Pancasila economy. In this way, it positively impacts the lives of teachers and students because they can apply it in both micro and macroeconomic life (Wahyono et al., 2023).

Furthermore, future research needs to be tested using a variety of methodologies, including self-report measures from teacher questionnaires, student evidence and observations, and data from standardized tests. By realizing these limitations, this research can provide a concise model that has the opportunity to reduce the complexity of the model in explaining the integration of digital technology in schools and universities. Another says that future research must address this study's limitations, including its cross-sectional design and reliance on self-reported data. Longitudinal studies could disentangle causality between UR and EPST, while mixed-methods approaches could uncover hidden barriers (e.g., regional disparities in internet access). Practically, the findings advocate for curriculum reforms in Indonesian teacher education programs, such as embedding adaptive digital literacy modules and fostering inter-university exchanges to mitigate infrastructural gaps. For instance, by leveraging *Pancasila*-aligned pedagogy, universities could integrate case studies on socio-economic equity using digital tools, ensuring TR aligns with national development goals. Policymakers should prioritize institutional investments in EdTech ecosystems, recognizing that UR improvements (e.g., standardized ICT resources) directly amplify EPST and TR. These steps address the study's identified gaps and position Indonesia as a leader in context-sensitive, equitable technology integration models for global education discourse.

CONCLUSION

This research succeeded in concluding several practical implications. Of course, technology readiness is impossible to fight for only on the part of prospective teachers. Prospective teachers in Indonesia differ in their technology readiness; many factors are causing this, such as family environment, financial conditions, and culture at each university. Therefore, universities play a significant role in supporting the technology readiness of prospective teachers. Providing digital facilities and infrastructure is an absolute thing that must be fulfilled. However, the roadmap regarding unifying the use of technology, support from university stakeholders, and student exchange between prospective teachers and other universities between countries is also important to improve. More support is also needed for lecturers to take part in training related to the latest technological developments related to educational technology. This way, lecturers can teach it to students or prospective economics teachers. With this training and exchange, it is hoped that they can boost their research to become more innovative and valuable for developing the application of technology in economic learning. Apart from other factors not examined in this research, this research can also prove that the EPST and UR are the most important contributors to the technological readiness of prospective teachers in general and prospective economics teachers in particular. Finally, to support the progress of Industry 4.0, research needs to be further developed based on digital entrepreneurship and adjusted to the vision and mission of each university.

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