

# Beyond Technical Skills: Linking Teacher Self-Efficacy to Job Satisfaction via Sustainable Digital Practice

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**To Cite:** Sembiring, E.R., Septiarti, S.W., & Jabar, C.S.A. (2026). Beyond technical skills: Linking teacher self-efficacy to job satisfaction via sustainable digital practice. *Malaysian Online Journal of Educational Technology*, 14(2), 39-49. <http://dx.doi.org/10.52380/mojet.2026.14.2.644>

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## ABSTRACT

The transition from emergency remote teaching to sustainable digital integration remains a critical challenge in developing countries. This study investigates how teacher self-efficacy and digital literacy influence the sustainability of online teaching practices and their subsequent impact on job satisfaction in the context of Indonesia's ongoing digital transformation. Utilizing a quantitative cross-sectional survey design, data were collected from 118 Indonesian educators and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicate that psychological resilience (teacher self-efficacy) is a stronger predictor of practice sustainability than technical skills (digital literacy). Furthermore, the sustainability of online teaching practice serves as a crucial mediator that bridges teacher competencies and job satisfaction. These findings offer vital insights for policymakers, suggesting that institutional support must go beyond hardware investment to prioritize fostering teacher self-belief and creating a supportive ecosystem. This approach is essential to ensure long-term digital adoption and ensure professional well-being in the post-pandemic era.

**Keywords:** *Teacher self-efficacy, digital literacy, sustainable online teaching, teacher job satisfaction, technology integration.*

## Article History:

Received: 28 January 2026

Received in revised form: 25 March 2026

Accepted: 17 April 2026

Article type: Research Article

## INTRODUCTION

Digital transformation has been an inexorable force in the evolution of global education over the past few decades, promising increased accessibility, personalized learning, and efficiency (Huang et al., 2024). While the global pandemic initially accelerated this trend, the focus in the contemporary educational landscape has firmly shifted toward establishing online and hybrid models as integral, permanent components of practice rather than emergency measures (Mena-Guacas et al., 2025; Mingot & Marín, 2024). However, this rapid shift presents a critical new challenge that moves beyond initial adoption to long-term sustainability (Barz et al., 2024). This challenge is particularly acute in developing contexts like Indonesia. As an archipelago of over 17,000 islands, Indonesia mirrors the struggles of the Global South, grappling with significant digital divides and uneven infrastructure that complicate the uniform application of digital learning (Putra & Satria, 2025). Consequently, massive government investment in hardware and policy reform underscores the urgent need to ensure teachers are psychologically and technically prepared for sustained technology integration (Singh et al., 2021).

The sustainability of online teaching is measured not only from a technical perspective but also from a human perspective, specifically ensuring that teachers remain satisfied and motivated (Zhou et al., 2024). Teacher self-efficacy is identified as one of the most critical psychological factors in this equation (Aslan, 2021). Rooted in social cognitive theory, self-efficacy refers to a teacher's belief in their capability to succeed

in specific tasks, such as managing virtual classrooms or motivating students remotely (Bandura, 1997). Teachers with high self-efficacy are more likely to be persistent and innovative when facing the diverse technical challenges encountered across the archipelago (Obeid et al., 2024). However, self-efficacy must be supported by relevant competencies, particularly digital literacy (Getenet et al., 2024). Beyond mere technical skills, digital literacy in the teaching profession encompasses the critical ability to find, evaluate, and synthesize information from the internet for instructional purposes (Yi et al., 2024). This capability is vital in Indonesia's landscape, which is often challenged by misinformation, ensuring teachers act as reliable curators of learning content (Sawyer et al., 2020).

Current discourse on digital education often reveals a tension between two dominant paradigms: the *competence-driven* perspective and the *resilience-driven* perspective. The competence-driven perspective prioritizes technical mastery and digital literacy, arguing that pedagogical success relies on teachers' abilities to navigate and curate digital platforms (Avinç & Doğan, 2024; Guo et al., 2024). In contrast, the resilience-driven perspective emphasizes psychological adaptability, suggesting that in highly volatile environments, a teacher's self-efficacy and emotional capability are the true determinants of success (Anderson et al., 2021). While recent studies have proliferated documenting the necessity of digital skills in post-pandemic settings (Mena-Guacas et al., 2025), many of these analyses remain largely descriptive. They often fail to problematize a critical reality: what happens when a highly digitally literate teacher faces chronic, systemic infrastructure failures? A significant gap exists in understanding whether technical competence alone is sufficient or if psychological resilience acts as the definitive catalyst for sustaining practices in resource-constrained, real-world environments like Indonesia. Furthermore, the existing literature frequently conflates initial technology *adoption* with long-term *sustainability*. While adoption is a discrete event, sustainability is an ongoing, adaptive process requiring continuous negotiation with systemic barriers.

Previous literature has extensively utilized initial adoption models, such as the Technology Acceptance Model (TAM) or the Unified Theory of Acceptance and Use of Technology (UTAUT), to predict teachers' intentions to use digital tools (Alkhwaldi, 2023). However, these frameworks are inherently individualistic and linear, focusing heavily on initial acceptance rather than the complex, long-term post-adoption phenomenon (Sánchez-Prieto et al., 2019). Sustaining online teaching practices is fundamentally different from merely adopting them; it requires a shift from an adoption paradigm to a sustainability paradigm. To conceptualize this, the present study draws upon Socio-Technical Systems Theory (STS) and psychological resilience frameworks. STS posits those successful organizational operations—such as sustainable digital education—rely on the harmonious interaction between human psychological components (e.g., self-efficacy and digital literacy) and technical/institutional structures (e.g., institutional support and ease of access).

Viewed through this socio-technical lens, the sustainability of online teaching is not merely an individual behavioral intention, but a dynamic capability rooted in resilience. In developing contexts like Indonesia, where infrastructural disparities and systemic barriers are prevalent, teachers must possess psychological resilience to navigate ongoing disruptions. Therefore, this study aims to bridge the existing conceptual gap by developing and testing a structural model that investigates how individual-level competencies (teacher self-efficacy and digital literacy) interact with systemic dimensions to predict the sustainability of online teaching practices. Furthermore, the study examines how achieving this sustainable practice serves as a critical mechanism—or mediator—that ultimately safeguards teacher job satisfaction in the post-pandemic digital era. Specifically, this study tests the following hypotheses:

H1: Teacher self-efficacy has a significant positive effect on the sustainability of online teaching practice.

H2: Digital literacy has a significant positive effect on the sustainability of online teaching practice.

H3: Sustaining online teaching practice has a significant positive effect on teacher job satisfaction.

H4: Sustaining online teaching practice significantly mediates teacher self-efficacy and job satisfaction.

H5: Sustaining online teaching practice significantly mediates the relationship between digital literacy and teacher job satisfaction.

## RESEARCH METHOD

### Research Model

This study utilized a quantitative, cross-sectional survey design to test a predictive model of sustainable online teaching practices. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), chosen for its suitability with predictive, complex models.

### Participants

The target population was Indonesian teachers with established experience in implementing digital learning. A purposive sampling technique recruited 118 educators. Based on teaching level, respondents consisted of 47 elementary school teachers (39.8%), 40 junior high school teachers (33.9%), and 31 senior high school teachers (26.3%). Most respondents were female, accounting for 73.72% ( $n = 87$ ) of the sample, while male respondents constituted 26.28% ( $n = 31$ ). The age of the participants ranged from 24 to 58 years, with a mean age of 36.7 years ( $SD = 8.3$  years). In terms of professional experience, the participants' tenure in teaching varied widely, from 1 year to 36 years, with an average teaching experience of 11.5 years ( $SD = 8.5$  years). Although this sample size ( $N=118$ ) is considered moderate, the selection of PLS-SEM is highly appropriate as it can work efficiently with relatively small sample sizes and handle complex models without strict data distribution assumptions (J. Hair & Alamer, 2022; Hult et al., 2021). Furthermore, a post-hoc power analysis using G\*Power 3.1 confirmed the sample size was sufficient, with the achieved statistical power exceeding 0.99, far above the 0.80 threshold (Cohen, 1988).

### Data Collection Tool

A structured questionnaire with a 5-point Likert scale was used for data collection. The instrument measured the study's core constructs by adapting previously validated scales. Teacher self-efficacy was measured using the scale from Gálvez-nieto et al. (2023), Teacher Job satisfaction was adopted from Sembiring & Purba (2019) and digital literacy was assessed with the scale from Avinç & Doğan (2024). The key mediating variable, sustainability of online teaching practices, was a higher-order construct with dimensions adapted from Türel et al. (2017), Zuo et al. (2024) and Ulfah et al., (2024).

### Collection of Data

Data collection was conducted using a purposive sampling technique to ensure respondents met the criteria of having established experience in digital learning. A structured questionnaire was developed and administered to the target population of Indonesian educators. The survey was distributed to teachers across different levels of education (elementary, junior high, and senior high) to capture a comprehensive cross-section of the population.

### Data Analysis

Data were analyzed with SmartPLS 4 using the recommended two-stage PLS-SEM approach. First, the measurement model was assessed for reliability and validity by examining standard metrics including indicator loadings, Average Variance Extracted (AVE), Composite Reliability (CR), and Heterotrait-Monotrait Ratio (HTMT) values. Second, the structural model was assessed via a bootstrapping procedure (5,000 resamples) to test the hypothesized relationships by evaluating path coefficients ( $\beta$ ), t-statistics, and p-values. The model's explanatory and predictive power was confirmed using  $R^2$  values, following established guidelines (J. F. Hair et al., 2021).

### Validity and Credibility

The measurement model evaluation confirmed the validity and reliability of each construct used in the research model. The analysis showed that all indicators have factor loadings meeting the recommended criteria ( $>0.7$ ), with values ranging from 0.759 to 0.931, confirming that all indicators validly reflect their respective constructs. Furthermore, the Average Variance Extracted (AVE) values for all constructs were above 0.5, ranging from 0.601 to 0.803, indicating good convergent validity. Composite Reliability (CR) values exceeded 0.7 for all constructs, ranging from 0.841 to 0.925, indicating strong internal reliability across all

scales. Discriminant validity was also established, with all constructs meeting the Fornell-Larcker criterion and HTMT values remaining below the 0.90 threshold.

**Table 1. Outer Model Assessment**

Item	Factors	Standard factor loadings	Cronbach's alpha (>0.6)	CR>0.7	AVE>0.5
Teacher Self-efficacy (TSE)	TSE 1	0.787	0.860	0.900	0.642
	TSE 2	0.847			
	TSE 3	0.808			
	TSE 4	0.759			
	TSE 5	0.802			
Digital Literacy (DL)	DL 1	0.888	0.885	0.929	0.813
	DL 2	0.931			
	DL 3	0.885			
Sustaining Online Teaching (SOT)	EOT TOT	0.779	0.634	0.807	0.587
	IA TOT	0.616			
	IS TOT	0.879			
Teacher Job Satisfaction (TJS)	TJS 1	0.871	0.717	0.839	0.636
	TJS 2	0.702			
	TJS 3	0.810			

**Table 2. Heterotrait-Monotrait Ratio (HTMT)**

	TSE	DL	SOT	TJS
TSE				
DL	0.693			
SOT	0.848	0.699		
TJS	0.673	0.516	0.870	

**Table 3. Fornell-Larcker Criterion**

	TSE	DL	SOT	TJS
TSE	0.801			
DL	0.604	0.901		
SOT	0.621	0.520	0.766	
TJS	0.554	0.435	0.618	0.797

**FINDINGS**

Structural model testing was conducted to evaluate the model's explanatory power, predictive relevance, and the significance of the hypothesized relationships. The explanatory power was assessed using the coefficient of determination ( $R^2$ ) Teacher Self-Efficacy and Digital Literacy together explain 41.9% ( $R^2 = 0.419$ ) of the variance in Sustaining Online Teaching Practice. Meanwhile, Sustaining Online Teaching Practice explains 38.1% ( $R^2 = 0.381$ ) of the variance in Teacher Job Satisfaction. Both values indicate moderate explanatory power. Furthermore, to address the model's out-of-sample predictive capabilities, the cross-validated redundancy ( $Q^2$ ) was calculated using the blindfolding procedure. The  $Q^2$  values for Sustaining Online Teaching Practice (0.229) and Teacher Job Satisfaction (0.230) are both greater than zero, confirming that the structural model possesses adequate predictive relevance (Hair et al., 2021).

In addition to evaluating the path significance, effect sizes ( $f^2$ ) were assessed to determine the strength of each predictor. As presented in Table 4, the effect of sustaining online teaching practice on teacher job satisfaction is highly substantial, indicating a large effect size ( $f^2 = 0.617$ ). The effect of teacher self-efficacy on sustaining online practice is categorized as moderate ( $f^2 = 0.256$ ), whereas digital literacy demonstrates a small effect size ( $f^2 = 0.057$ ).

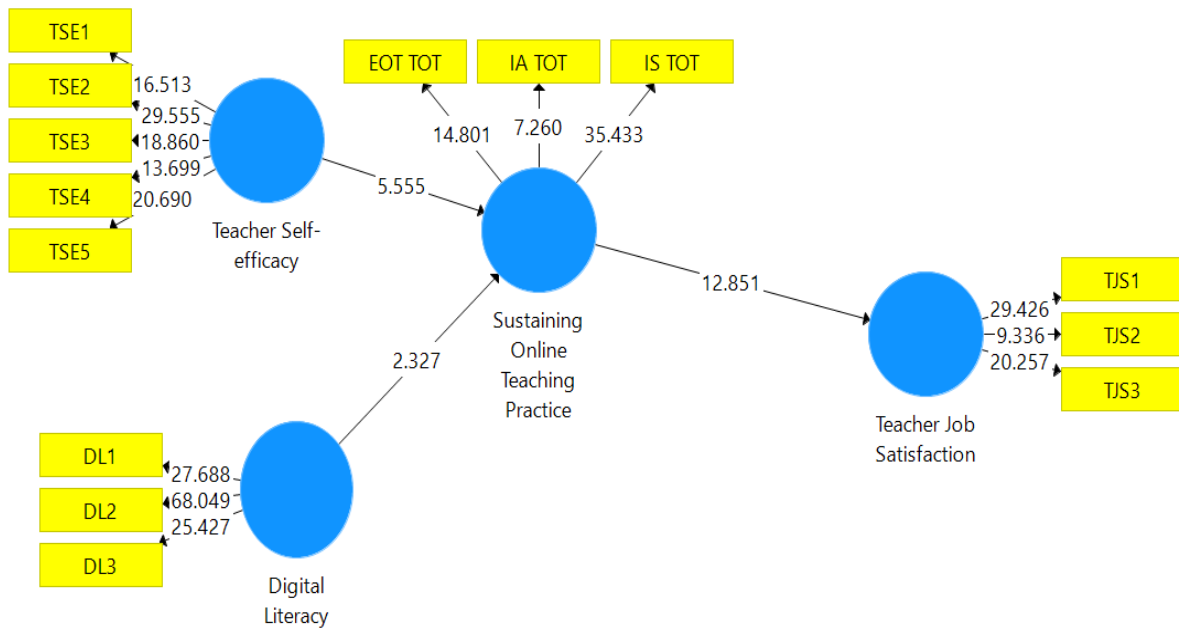


Figure 1. Structural Model Assessment

Table 4 presents the results of direct hypothesis testing, where a hypothesis is considered significant if the t-statistic value is more than 1.96 (p-value <0.05). H1 is accepted. Teacher Self-Efficacy has a positive and significant influence on Sustaining Online Teaching Practice ( $\beta = 0.484$ ;  $t = 5.555$ ;  $p = 0.000$ ). Digital Literacy has a positive and significant influence on Sustaining Online Teaching Practice (H2) ( $\beta = 0.228$ ;  $t = 2.327$ ;  $p = 0.020$ ). Sustaining Online Teaching Practice has a positive and significant influence on Teacher Job Satisfaction (H3) ( $\beta = 0.618$ ;  $t = 12.851$ ;  $p = 0.000$ )

Table 4. Hypotheses Testing

Hypotheses	Pathway	Pathway coefficient	t-stats	p-value	STDEV	F <sup>2</sup>	Result
H1	Teacher Self-Efficacy -> Sustaining online teaching	0.484	5.555	0.000	0.085	0.256	Accepted
H2	Digital Literacy -> Sustaining Online Teaching	0.228	2.327	0.020	0.095	0.057	Accepted
H3	Sustaining online teaching -> Teacher Job Satisfaction	0.618	12.851	0.000	0.050	0.617	Accepted

A mediation hypothesis test (Specific Indirect Effects) was conducted to examine the role of Sustaining Online Teaching Practice as a mediator, with 95% bias-corrected confidence intervals (CI) reported to ensure statistical robustness. The results, presented in Table 5, indicate that both H4 and H5 are accepted. Specifically, the sustainability of online teaching practices significantly mediates the relationship between Teacher Self-Efficacy and Teacher Job Satisfaction (95% CI [0.185, 0.434]). Furthermore, the test also confirmed that sustaining online teaching significantly mediates the relationship between Digital Literacy and Teacher Job Satisfaction (95% CI [0.012, 0.257]). Because the confidence intervals for both indirect effects do not include zero, both mediation hypotheses are strongly supported. This indicates that the influence of teacher self-efficacy and digital literacy on job satisfaction occurs indirectly through their ability to sustain online teaching practices.

**Table 5. Indirect Hypotheses Testing**

Hypotheses	Pathway	Pathway coefficient	t-stats	p-value	95% CI		result
					LL	UL	
H4	Teacher Self-Efficacy -> Sustaining online teaching-> Teacher Job Satisfaction	0.299	4.619	0.000	0.185	0.434	Accepted
H5	Digital Literacy -> Sustaining Online Teaching -> Teacher Job Satisfaction	0.141	2.273	0.023	0.012	0.257	Accepted

## DISCUSSION

This study successfully confirmed the proposed model, demonstrating that teacher self-efficacy and digital literacy are significant predictors of the sustainability of online teaching practices in Indonesia's digital era. Furthermore, these findings demonstrate that the sustainability of these practices serves as a crucial bridge connecting teacher competency with their job satisfaction.

### Self-Efficacy as a Key Psychological Foundation for Sustainable Online Teaching Practices

The first and most striking finding is the positive and significant influence of teacher self-efficacy on the sustainability of online teaching practices (H1), as evidenced by a path coefficient of 0.484 ( $p < 0.05$ ). This significant coefficient indicates that self-efficacy is not merely a supporting factor but a key psychological foundation that drives teachers to continue adopting and maintaining technology-based teaching practices. This finding aligns with Bandura's (1997) social cognitive theory, which states that an individual's belief in their abilities (self-efficacy) strongly predicts persistence and resilience in the face of challenges. In the Indonesian context, where teachers face real challenges such as the digital divide, uneven internet quality, and varying student access to devices, self-efficacy is an internal 'fortress'. Teachers with high self-efficacy tend to be more proactive, innovative in seeking pedagogical solutions, and persistent when faced with technical obstacles, all of which are essential prerequisites for the sustainability of quality online teaching practices (Sucipto, 2023).

One of the most interesting findings from this model is the stronger influence of self-efficacy ( $\beta=0.484$ ) compared to digital literacy ( $\beta=0.228$ ) in predicting the sustainability of online teaching practices. This suggests that in an educational landscape facing systemic infrastructure challenges, teachers' psychological resilience appears to be a highly crucial resource. However, an alternative interpretation must also be considered. The stronger statistical effect of self-efficacy could partially stem from the specific operationalization of the digital literacy scale used, or the actual baseline level of technical competence among the sampled teachers. A digitally literate teacher might still experience frustration when faced with poor connections; conversely, teachers with high self-efficacy tend to persist in seeking alternative solutions (Ulfah et al., 2024). In other words, while digital literacy is a necessary tool, self-efficacy functions as the vital engine driving persistence amidst uncertainty.

### The Crucial Role of Digital Literacy as a Supporting Competency

Furthermore, this study also confirmed that digital literacy has a positive and significant influence on the sustainability of online teaching practices (H2), with a path coefficient of 0.228 ( $p < 0.05$ ). Although the effect is not as strong as self-efficacy, this finding confirms that relevant competencies must support self-confidence. It is important to emphasize that digital literacy in this study is measured beyond the technical ability to operate a platform. It encompasses a higher level of ability, namely, critically evaluating the

credibility of online information, including the author's background and the purpose of the post. This ability is vital in Indonesia's digital landscape, which is vulnerable to misinformation and hoaxes. Digitally literate teachers can use technology and act as reliable curators of learning content for students (Guo et al., 2024). This competency gives teachers a greater sense of security and control in online learning environments, thus encouraging them to continue utilizing digital resources sustainably (Ali et al., 2023).

### **Sustainability of Practice as a Bridge to Teacher Job Satisfaction**

The strongest finding in this research model is the highly significant positive effect of the sustainability of online teaching practices on teacher job satisfaction (H3), with a path coefficient of 0.618 ( $p < 0.05$ ). This figure indicates that when online teaching practices transition from an emergency reactive mode (EMR) to a planned, supported, and stable system, they become a significant source of professional satisfaction. The sustainability construct in this study includes positive perceptions of information access, platform ease of use, and, most importantly, the presence of institutional support (such as training and technical assistance). It implies that challenges such as technostress and additional workload associated with digital transition can be mitigated (Zarubina et al., 2024). When online practices are smooth and effective, they transform from a source of frustration to a source of achievement, flexibility, and creativity, ultimately significantly enhancing teacher job satisfaction (Srivastava et al., 2024). These findings have significant implications for school administrators and policymakers globally, particularly in addressing critical digital era issues such as technostress and teacher burnout. They empirically confirm that teacher job satisfaction is not achieved simply by providing technology, but by creating a stable and supportive ecosystem. Sustainability of practice—characterized by institutional support and ease of use—is validated here as a central mechanism for transforming technology integration from a source of frustration to a source of professional satisfaction. This is a universal management principle for the digital education era.

### **The Role of Mediating: Synergy between Individual Competence and Systemic Support**

The culmination of this model analysis lies in the proven mediating role of the sustainability of online teaching practices in the relationship between teacher competency (self-efficacy and digital literacy) and job satisfaction (H4 and H5). This finding provides a crucial insight: high self-efficacy and digital literacy do not automatically lead to job satisfaction. The influence of these two factors must be bridged, namely, the teacher's experience in implementing sustainable and systemically supported online teaching practices. It means that even a highly competent and confident teacher will still feel frustrated and dissatisfied if their work environment is not supportive—for example, a difficult platform, a lack of training, or minimal technical support. Conversely, competence and self-confidence will translate into job satisfaction only when teachers perceive that their online teaching practices are running well, efficiently, and valued by the institution (Aljumah, 2023). It confirms that interventions cannot simply focus on improving individual capacity to achieve teacher well-being in the digital era. However, they must be accompanied by creating a supportive and sustainable institutional ecosystem (Yi et al., 2024).

### **Theoretical Implication**

Theoretically, this study makes a significant contribution by filling a previously identified research gap. It successfully developed and empirically tested an integrated structural model explaining how individual-level antecedents (self-efficacy and digital literacy) influence affective outcomes (job satisfaction) through the crucial mediating role of online teaching practice continuity. By positioning 'practice continuity' as a mediator, this study offers a more nuanced understanding than previous studies that often focus solely on direct relationships. This model emphasizes that practice continuity is not simply a technical variable but a psychological and organizational process essential in transforming teacher competency into job satisfaction.

Furthermore, by taking into account the unique context of Indonesia as a developing country in the digital era, these findings enrich the existing global literature and provide contextually relevant empirical evidence.

## CONCLUSION

This study aimed to test a structural model of the factors influencing the sustainability of online teaching practices and their impact on teacher job satisfaction in Indonesia's digital era education landscape. Based on comprehensive data analysis, the study concluded that teacher self-efficacy and digital literacy positively and significantly contribute to the sustainability of online teaching practices. More crucially, the sustainability of the practices themselves emerged as a significant predictor of teacher job satisfaction, while also acting as an essential mediating bridge. This suggests that a teacher's competence and self-confidence will translate more effectively into professional satisfaction when supported by a stable, accessible, and institutionally supported digital ecosystem. Ultimately, this study contributes to the broader discourse on the United Nations Sustainable Development Goal 4 (Quality Education) by confirming that building a resilient educator workforce requires a holistic approach. The key to sustainable digital integration lies in the careful synergy between individual capacity building and the cultivation of a supportive systemic work environment.

### Limitations and Recommendations

While this study has provided valuable insights, it is important to acknowledge some inherent limitations. First, the study used a cross-sectional survey design, where data were collected simultaneously. While this design effectively examines relationships between variables, it cannot fully capture causality dynamics over time. For instance, this cross-sectional nature introduces the risk of reverse causality; it is plausible that teachers who already possess high job satisfaction are inherently more motivated and energized to sustain their online teaching practices, rather than sustainability purely driving their satisfaction.

From a practical perspective, the findings of this study provide a strong empirical basis for shaping educational policies and strategies in the digital age. In particular, for the Ministry of Primary and Secondary Education (Kemendikdasmen), the results clearly demonstrate that substantial investments in technological infrastructure—such as Interactive Flat Panels (IFPs)—are unlikely to yield meaningful outcomes unless they are accompanied by comprehensive teacher professional development programs. Such programs should extend beyond technical training and focus on two critical areas: enhancing teachers' self-efficacy and confidence in managing dynamic digital classrooms and strengthening critical digital literacy skills that enable them to evaluate and curate online content responsibly in an era of widespread misinformation. The findings also highlight the pivotal role of school administrators in fostering a supportive institutional ecosystem. Sustainable implementation depends on providing responsive technical support, ensuring access to continuous and relevant training opportunities, and cultivating a collaborative professional culture among teachers. Furthermore, for Teacher Training Institutions (LPTK), the study underscores the urgency of revising preservice teacher education curricula to explicitly develop both psychological resilience—particularly self-efficacy—and critical digital pedagogical competencies, thereby preparing future teachers for the evolving demands of the profession.

Building on the study's limitations, several directions for future research can be proposed to deepen and broaden understanding in this field. First, longitudinal research designs are needed to track the development of teachers' self-efficacy, digital literacy, and job satisfaction over multiple semesters, enabling stronger conclusions about causal relationships among these variables. Second, to enhance generalizability, future studies should employ larger and more representative samples and conduct comparative analyses across diverse contexts, including urban, rural, and 3T (frontier, outermost, and disadvantaged) regions, in order to examine how contextual factors—particularly disparities in digital infrastructure—moderate the

proposed model. Third, the adoption of mixed-methods approaches is strongly recommended; integrating quantitative data with qualitative insights from interviews or focus group discussions would provide a more nuanced understanding of the underlying mechanisms, such as identifying which forms of institutional support most significantly influence teacher self-efficacy. Finally, experimental or quasi-experimental studies should be conducted to test the effectiveness of targeted interventions—such as professional development programs aimed at enhancing self-efficacy and critical digital literacy—and to directly assess their impact on the sustainability of teaching practices and overall job satisfaction.

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