

Teachers' Readiness in Online Learning: Digital Literacy-Self-Efficacy, Pedagogical Competence, Attitude, Infrastructure, and Management Support

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Abstract: Information and communication technologies (ICTs) are now used in education as a necessary tool. ICTs are used extensively in education, therefore, in order for teachers to effectively manage their classrooms, they need to be highly digitally skilled and have good attitudes. The spread of digital technology poses challenges as well as prospects, particularly for the younger generation. Online distance education provides individuals with convenient and accessible avenues for engaging in educational pursuits. The research aimed to analyze the teachers' readiness in online learning: digital literacy-self-efficacy, pedagogical competence, attitude, infrastructure, and management support in Indonesia. The research conducted was a quantitative study employing a survey design. The survey data was analyzed using Structural Equation Modelling (SEM) with AMOS. A questionnaire was used to gather the data. There were 2.788 teachers involved as participants throughout Indonesia. The results show the relationship between the five indicators in digital literacy-self-efficacy (TR-DLSE), pedagogical competence (PC), attitude readiness (AR), infrastructure readiness (IR), and management support (MS). The readiness in terms of attitude explains the construct the best compared to the other four indicators with a value of 0.996. The square of factor loading (FL) on the readiness of attitude is 0.93, indicating that 93% of teacher readiness levels in online learning are influenced by the enthusiastic attitude of the teachers in Indonesia. It can be concluded that the teachers' attitude readiness for online learning in Indonesia influences teachers' readiness. Suggestions for further research are provided.

Keywords: Attitude, Digital literacy, Management support, Pedagogical competence, Self-Efficacy, Teachers' readiness

1. Introduction

Teachers are vital stakeholders in the education system (Adegbola, F. 2019). The teachers play a crucial role in preparing and inspiring a new generation to effectively teach in contemporary classrooms (Arismunandar et al., 2022). Their active involvement can significantly enhance pre-service teachers' technology-enhanced teaching practises (Liu 2016; Ping, Schellings, and Beijaard 2018). The task of equipping prospective educators with the necessary skills to effectively incorporate technology into their instructional methods is a growing difficulty faced by teacher trainers (Tondeur et al. 2019). To train pre-service teachers, they need to help them bridge the gap between technology, pedagogy and content knowledge.

Moreover, technological developments are changing the education world through various activities (Hasyim et al. 2024). The COVID-19 pandemic has provided lessons, one of which is accelerating the use of digital technology, especially in education (Zalavra and Makri 2022). The advent of technology has caused much change in human life (Enwereji et al., 2023; Al Arif et al. 2024). It is not a new phenomenon in this era (Achim and Kassim 2015). Where educators, education staff and students become accustomed to using digital facilities to transform the data and information that needs to be accessed (Schmid, Brianza, and Petko 2021). The presence of technology shapes digital society. Digital literacy skills are the most basic and crucial in dealing with technological developments to facilitate educational activities.

ICT competency is a crucial component of communication skills (Becuwe et al. 2017; Foulger et al. 2017). It has profoundly changed our society and this is the basis of today's knowledge society (Almerich et al. 2016); it has emerged as a focal point in the aims and learning outcomes of the Indonesian national curriculum. The utilization of computers and internet technology has become a commonplace occurrence in the daily activities of students and teachers (Suwanto et al., 2022). This is primarily due to the accessibility and affordability of the internet and social media platforms for the general population. Nevertheless, specific challenges persist in deploying Information and Communication Technology (ICT) in infrastructure and digital literacy.

The survey findings on the development of technology indicate that the percentage of internet users in Indonesia stands at 20.4%, corresponding to a total of 53,236,719 individuals out of the country's population of 260,581,100. However, it is worth noting that the ICT skills of these internet users in Indonesia are comparatively lower than the average proficiency observed in other OECD countries (OECD 2015). The acquisition and application of digital learning abilities and the adoption of digital learning methods continue to pose challenges for Indonesian students and teachers (Hafifah and Sulisty0 2020).

Meanwhile, based on a survey conducted by the Ministry of Communication and Information, the national digital literacy reading status data refers to UNESCO. This shows that the digital literacy index in Indonesia is only slightly above moderate but this is not yet reasonable. Achieving a good level of literacy requires the role of all parties, including the government and society and support from the world of education. On a smaller scale, school organizational support plays a role in accelerating the digital transformation process. The administrative support referred to in this case includes facilities, infrastructure, and a comfortable environment for educators, education staff, and students in the school environment. In the digital era like today, daily activities are used. Digital media can no longer be avoided. Therefore, high digital literacy skills are required for every teacher. With digital literacy skills, information will be obtained very quickly. Teachers with good literacy skills will influence the learning process, increasing student teacher self-efficacy and ultimately improving performance. With high literacy skills, teachers will have the most up-to-date knowledge.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), digital literacy is a skill set and tool for employment and entrepreneurship (United Nations Educational 2018). Digital literacy allows individuals to interact and participate on digital platforms. The descriptions above incorporate a social aspect to the concept of digital literacy and define it as a collection of competencies that encompass various abilities to utilize digital devices, communication applications, and networks to access, manage, and evaluate, which can be employed to engage in social interactions or foster personal growth. Digital literacy and ICT literacy education in Indonesia is typically included in the IT curriculum offered in schools, focusing on technical skills. Additionally, informal blogs or portals are utilized to disseminate common knowledge in ICT (Rahmah 2015).

In education, social skill is regarded as an essential attribute for several compelling reasons. The primary focus of a teacher's role is to offer instructional support in the pursuit of knowledge, which fundamentally involves a dynamic and collaborative social exchange. Educators must observe classroom dynamics systematically, provide social contexts that facilitate learning, and establish and sustain connections with students and their parents. Furthermore, an essential responsibility of educators is to impart social skills to their students. Consequently, acquiring and instructing these abilities becomes a primary and secondary endeavour within teacher training. In recent years, the teaching profession has significantly expanded, shifting from solely focusing on instructional activities to including a wide range of multi-professional collaborative duties that require shared expertise and social skills (Tynjälä et al. 2016).

Many researchers having conducted teachers' pedagogical competence in technology stated that the subject variable emerged as the only significant predictor, indicating that STEM pre-service teachers exhibited beneficial relationships between Technological Pedagogical Content Knowledge (TPACK) components and the utilization of technology in their lesson plans. The predictive factor for the integration of mobile technology was shown to be teachers' self-efficacy (Schmid et al. 2021). Significant heterogeneity in the competencies and knowledge possessed by teaching professionals demonstrated a relatively limited range of diversity in their views. An essential outcome of this study is an enhanced comprehension of digital competence as perceived by teaching professionals (Hämäläinen et al. 2021). One could propose that in the field of teacher education, a potentially beneficial approach towards attaining proficient technology integration involves explicitly promoting teachers' personal values, with a particular emphasis on cultivating their views on the implementation of technology in educational practices (Durak 2019). They positively predicted the relationships between self-efficacy beliefs and commitment to teaching (Chesnut and Burley 2015). Teachers' knowledge and incapacity toward technology also affect their teaching practices of ICT.

Some findings mentioned above investigate how teachers exhibited beneficial relationships between TPACK components and the utilization of technology in their lesson plans, integration of mobile technology in teachers' self-efficacy, comprehension of digital competence as perceived by teaching professionals, teachers' implementation of technology in educational practices, self-efficacy beliefs and how commitment to teaching and technology affects teachers' teaching practices of ICT.

On the contrary, other studies stated that the level of teachers' self-efficacy in using information and communication technology (ICT) is associated with their perception of the quality and value of their initial teacher education (ITE) on ICT, as well as its impact on their professional development and competence (PDC). Typically, recently appointed teachers express dissatisfaction with the degree and effect of information and communication technology (ICT) instruction received throughout their teacher training (Björk Gudmundsdottir, G., & Hatlevik 2016).

This issue is essential for the involvement of multiple stakeholders. Digital literacy plays a crucial role in facilitating the proficiency of both teachers and students in utilizing software, resolving cognitive and psychomotor challenges, as well as evaluating the credibility of online information and educational resources employed by teachers.

In this study, it is necessary to investigate the factors of Indonesian teachers' pedagogical competence relating to the readiness of self-efficacy, digital literacy, attitude, and management for the teachers in Indonesia as a gap for this study. It is essential to instil this gap to conduct further research. Therefore, the objectives of this study are to investigate the readiness of self-efficacy, digital literacy, attitude, and management for Indonesian teachers' pedagogical competence.

2. Literature Review

2.1 The Teachers' Readiness in Online Learning

The notion of readiness for online learning was developed by (Warner, D., Christie, G., & Choy 1998) in their study project on Australian vocational education and training sectors. Many researchers sought to examine readiness elements that affect online-learning performance (Hung 2016)). The readiness for online learning appears to be a significant determinant of their academic achievement in online courses (Wei and Chou 2020). The concept of readiness holds significant importance as it provides the fundamental basis for developing a theoretical framework concerning the preparedness and equitable encounters associated with online instruction (Cutri and Mena 2020). Online learning readiness is the assessment of certain organizational and individual factors that should be considered and successful with the introduction of an e-learning strategy (Aldhafeeri and Khan 2016).

2.2 Digital Literacy- Self-Efficacy (DLSE)

Digital literacy has gained prominence in educational and assessment programs of various governments since the beginning of the twenty-first century, primarily due to its significance in citizenship education (Pérez-Escoda, García-Ruiz, and Aguaded 2019). The challenge in comprehending and advancing digital literacy arises from its dynamic, cross-cutting, and adaptable characteristics. The integration of digital literacy within the educational sector is inherently intertwined with the role and responsibilities of the classroom teacher (Rusdiyati, Purwati, and Prabowo 2020). One of the internal factors that can affect the teacher is self-efficacy. Self-efficacy influences thinking processes, motivation levels, and feeling states, which all affect the type of performance performed (Bandura 2012). Self-efficacy is a person's belief in being able to master a particular situation and the ability to overcome an obstacle ((Hatlevik et al. 2018);(Lauermann and König 2016). If an individual has high self-efficacy, he can face all the tasks and problems in his life (Pellas 2014); (Zee and Koomen 2016). As the competence in these constituent elements advances, the corresponding level of self-efficacy is elevated (Williams et al. 2023).

2.3 Attitude Readiness (AR)

Individuals' attitudes are shaped by affective, behavioral, and cognitive elements (Zhu et al. 2020). The affective component might be understood as the evaluative aspect of an individual's attitudes. Attitude holders engage in the process of evaluating and forming judgments about an object, depending on both evaluative and emotive factors. The behavioural component is commonly perceived as an inclination to engage in action and embodies an intentional aspect within attitudes. The study examined the attitudes of students and instructors towards the transition to online education during the COVID-19 pandemic (Hussein et al. 2020).

Based on the literature review, the hypothesis examined in the study is shown in Table 1.

Table 1: Hypothesis

No	Hypotheses
H1	Teacher readiness (TR) will significantly influence teacher readiness in digital literacy-self-efficacy (TR-DLSE)
H2	Teacher readiness (TR) will significantly influence pedagogical competence (PC)
H3	Teacher readiness (TR) will significantly influence attitude readiness (AR)
H4	Teacher readiness (TR) will significantly influence infrastructure readiness (IR)
H5	Teacher readiness (TR) will significantly influence management support (MS)

3. Method

3.1 Research Design

The research conducted was a quantitative study employing a survey design. The survey was underpinned by multiple criteria that were advantageous in the study. This identified several key factors that contributed to the effectiveness of the research findings, including high representation of the results, low cost, ease of data collecting, positive statistical significance, low level of researcher subjectivity, and accurate research findings (Leavy 2017).

The survey data was analyzed using Structural Equation Modeling (SEM) with AMOS. Structural Equation Modeling (SEM) is regarded as the subsequent iteration of multivariate analysis within the field of study. This methodology is widely favoured among scholars and researchers to analyze data collected through surveys. The utilization of AMOS applications to adapt this structural equation modelling (SEM) method is highly suitable, as it will provide more precise outcomes (Mustafa, Nordin, and Abdul Razzaq 2020); (Collier 2020).

3.2 Participants

This study involved (n=2,788) teachers as participants throughout Indonesia. The teachers included kindergarten/preschool teachers, primary school teachers, junior high school teachers, and senior high school teachers in Indonesia. School leaders focus on developing teacher competence, especially in pedagogy and professionalism. Therefore, teachers are provided with the professional development that suits the needs of teachers and students and curriculum development. The following is participant demographic data based on gender, age, teaching experience, and latest education. Participant Demographic Data aged 20 – 60 years. Last education S1, S2 and S3.

The questionnaires were developed through 34 statements on the teachers' pedagogical competence relating to the readiness of self-efficacy, digital literacy, attitude, and management for the teachers in Indonesia. The questionnaires were used to measure the pedagogical competence of the teachers in terms of the skill aspect; the questionnaire contained (a) statements about teacher ability in managing learning, (b) statements about the application of method/technique/learning model (c) statements about teacher's communication (d) statements about understanding the characteristics of students, (e) statements about the use of learning resources and (f) statements about utilizing technology. The measurement scale used in these questionnaires was the Likert scale. In addition, the researcher also provided open questions to the mathematics teachers about the types and characteristics of training needed by mathematics teachers and the questions about the suitability of the activities that they followed with their needs.

3.3 Procedure

This research procedure consists of three main stages. The first stage is the preparation stage. At this stage, researchers identified problems or phenomena in the field. Then, researchers also conducted literature reviews from various sources, both from books and research journals. Furthermore, the researchers also asked for permission by submitting a letter of application to conduct research to the leadership at the institution where the study was held. Then, researchers began to prepare research instruments, namely questionnaires. The second stage was the data collection stage. At this stage, researchers distributed questionnaires to participants who started by filling out informed consent to be involved in this research. Before distributing the questionnaire, the researcher explained the purpose of this research and the benefits the participants would hopefully experience. The researcher said that participant honesty in filling out this questionnaire was essential because it was a self-evaluation; participants give themselves an assessment. Due to limited time and resources, the

researcher used a one-shot experiment method, namely, data collection, without formerly testing the instrument first. The third stage is data analysis after the data goes through testing using SEM PLS AMOS.

3.4 Instrument of the Research

The instrument used was a closed questionnaire relating to factors of Indonesian teachers' pedagogical competence about the readiness of self-efficacy, digital literacy, attitude, and management of the teachers in Indonesia. For the teacher self-efficacy variable, researchers used a questionnaire developed by (Tschannen-Moran, M., & Woolfolk Hoy 2001);(Tschannen-Moran, M., & Woolfolk Hoy 2007), namely the Teachers' Sense of Efficacy Scale ($\alpha = .94$). The statement questionnaire contains three dimensions of teacher self-efficacy in carrying out their duties, namely self-efficacy in learning strategies, interaction with students, and classroom management. Participants were asked to measure confidence. The questionnaire consists of 34 statement items regarding the teachers' readiness in online learning: digital literacy- self-efficacy, pedagogical competence, attitude, infrastructure, and management support in Indonesia.

For this reason, the teacher readiness level instrument was developed by researchers according to the needs of research subjects, by adopting it from various sources which was then developed based on research needs during the Covid 19 pandemic. Meanwhile, (Hung 2016) divides readiness in online learning into five dimensions: (1) independent learning, (2) learning motivation, (3) computer/internet self-efficacy, (4) learner control, and (5) online communication self-efficacy.

3.5 Data Collection Process

Structural equation modelling (SEM) is an exceedingly valuable framework due to its various advantages. Firstly, it facilitates exploratory and confirmatory research by integrating self-reflection, modelling proficiency, and theoretical foundations. The approach described is practical when applied within the philosophy of discovery or confirmation frameworks. Additionally, it proves valuable in various research methodologies such as experimental or survey research, cross-sectional or longitudinal studies, and endeavours involving measurement or hypothesis testing. Furthermore, this approach can be applied within different groups and across various institutional or cultural contexts (Bagozzi, R. P., & Yi 2012). Typically, each structural equation modelling (SEM) analysis follows a series of stages, including model formulation, data collection, estimation, evaluation, and potential model modification. Most structural equation modelling (SEM) evaluations are typically performed utilizing one of the dedicated SEM software applications. AMOS represents one of the entities under consideration. The AMOS software can generate bootstrapped standard error estimates and confidence intervals for parameter estimates. AMOS offers an additional method for doing a full-information maximum likelihood estimate in the presence of missing data (Lei, P. W., & Wu 2007). The AMOS software package was utilized to conduct confirmatory factor analyses (CFA) on the scales and structural equation modelling (SEM) to investigate the interrelationships among the constructs within the suggested model.

The AMOS software initially assessed the measurement model by confirmatory factor analysis. The model delineated distinct variables, including learning goal structure, performance goal structure, teacher self-efficacy, time pressure, emotional exhaustion, work satisfaction, and motivation to leave the profession. The primary objective of conducting the measurement model test was to validate the independence of the stated elements as distinct constructs and determine the extent of correlations among these factors. Subsequently, the theoretical model was subjected to examination using the utilization of structural equation modelling (SEM). To mitigate the influence of the substantial age disparity within the sample, the age of the teachers was used as an endogenous variable in the structural equation modelling (SEM) analysis (Byrne 2010). To evaluate the adequacy of the model, we employed standard indices such as the Comparative Fit Index (CFI), Incremental Fit Index (IFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA), with the chi-square test statistics. In the CFI, IFI, and TLI indices, it is generally accepted that values beyond 0.90 are deemed satisfactory, while values surpassing 0.95 suggest a strong alignment with the data.

Data analysis begins with testing the validity and reliability of the instrument. Then, continue with the classic assumption test, the prerequisite for regression analysis. This stage consists of four types of tests, namely normality test, multicollinearity test, heteroscedasticity test, and linearity test. The third stage is multiple linear regression analysis and hypothesis testing using the simultaneous f-test (Collier 2020).

4. Results and Discussion

4.1 Description of Results

Description of results including the readiness of self-efficacy, digital literacy, attitude, and management for the teachers in Indonesia.

Figure 1 shows that the total 2,877 respondents, there were 1,127 (39.2%) respondents aged 31-35. 794 (27.6%) respondents were between 36-40 years old. 431 (15%) respondents were 41-45 years old. 372 (12.9%) respondents were 26-30 years old. Moreover, other respondents under 12% were 56-60, 51-55, and 46-50 years old.

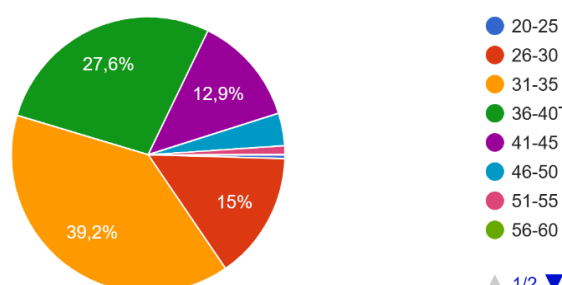


Figure 1: Age of respondents

Figure 2 shows that 356 (12.4%) respondents were kindergarten/preschool teachers. 494 (17.2%) respondents were senior high school teachers. 516 (17.9%) respondents were junior high school teachers. 1.302 (45.3%) respondents were shown as primary school teachers in Indonesia.

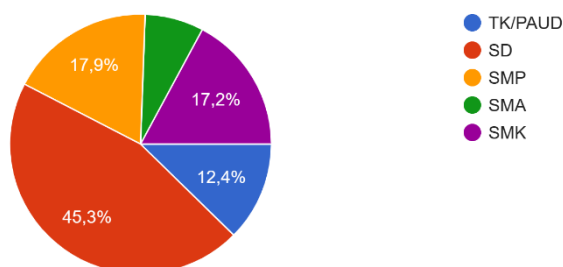


Figure 2: School Levels in Indonesia

Figure 3 shows that most respondents (96.3%), or 2,771 of 2,887 respondents, have recent education levels in S1. Based on model fit analysis in AMOS, the RMSEA value = 0.074 is obtained, which is smaller than 0.08, indicating that the model can be said to be a reasonable (plausible) representation of the data (Hair, J. F., Patel, M. L., & K. 2014).

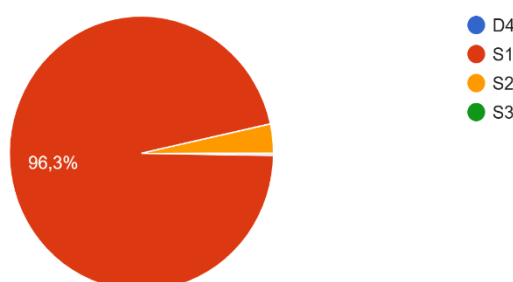


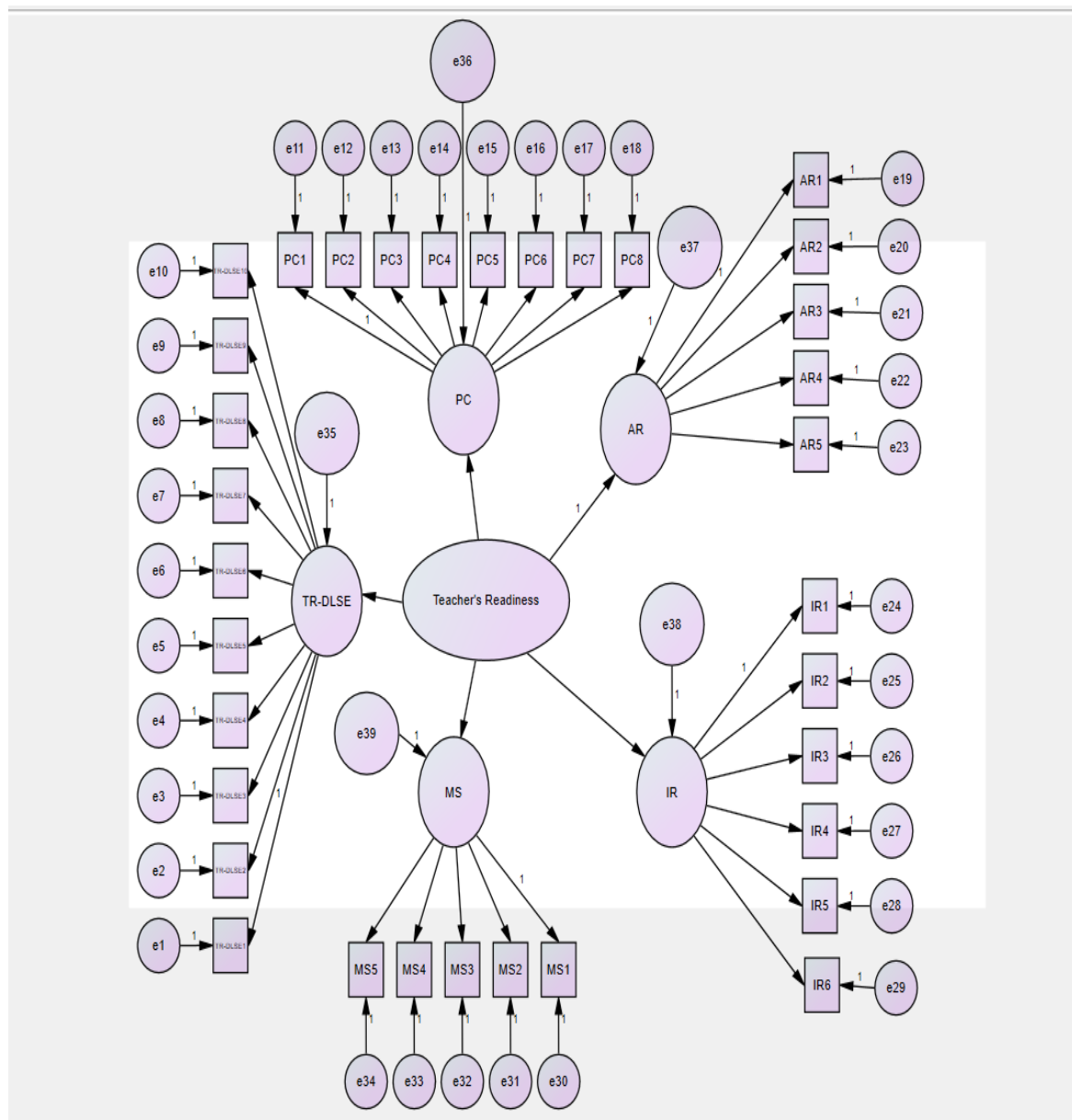
Figure 3: Recent Education of Respondents

An RMSEA value below 0.08 indicates that the model is adequate in representing the data. Specifically, the relationship between constructs, dimensions and their respective indicators is appropriate or appropriate in representing the data. This can be seen in Table 2.

Table 2: Reasonable (plausible) representation of the data

Model	RMSEA	LO 90	HI 90	CLOSE
Default model	0,074	0,073	0,075	0
Independence model	0,201	0,2	0,202	0

To ensure that the data can be represented reasonably using Structural Equation Modeling (SEM) with AMOS. This is needed to do the following steps: data distribution check, normality check, missing data management, model fit check, use of appropriate estimation methods, use of feature graphs and trees (see figure 4).

**Figure 4: Reasonable representation of the data by using SEM-AMOS**

In the Standardized Regression Weight (see table 3), the factor loading (Estimate) values are all above 0.5, indicating that the items can explain the indicators well and the hands can explain the construct well. By definition, factor loading (FL) is the magnitude of the correlation between the hand and its latent construct. For

example, TR1 (item 1) has an FL value of 0.619; this means that the correlation between TR1 and the indicator, namely TR, is 0.619.

The square of FL simply shows how much TR1 influences TR. Specifically, the court of FL shows the percentage of variance in the variable (indicator) that can be explained by the factor (item). In TR1, the square of 0.619 = 0.38, which shows that TR1 influences 38% of the variation/difference in TR data (see Table 3).

Information:

TR-DLSE : Teacher Readiness in digital literacy-self-efficacy

PC : Pedagogical Competence

AR : Attitude Readiness

IR : Infrastructure Readiness

MS : Management Support

Table 3: Standardized Regression Weight

Indicators		Construct/Indicator	Estimate	Quadrat Estimate
PC	<---	Teachers' readiness	0.924	0.85
IR	<---	Teachers' readiness	0.647	0,42
MSR	<---	Teachers' readiness	0,718	0,52
TR	<---	Teachers' readiness	0,763	0,58
RA	<---	Teachers' readiness	0,966	0,93
TR1	<---	TR	0,619	0,38
TR2	<---	TR	0,729	0,53
TR3	<---	TR	0,732	0,54
TR4	<---	TR	0,764	0,58
TR5	<---	TR	0,64	0,41
TR6	<---	TR	0,614	0,38
TR7	<---	TR	0,694	0,48
TR8	<---	TR	0,756	0,57
TR9	<---	TR	0,707	0,50
TR10	<---	TR	0,533	0,28
PC1	<---	PC	0,56	0,31
PC2	<---	PC	0,757	0,57
PC3	<---	PC	0,642	0,41
PC4	<---	PC	0,815	0,66
PC5	<---	PC	0,853	0,73
PC6	<---	PC	0,821	0,67
PC7	<---	PC	0,812	0,66
PC8	<---	PC	0,788	0,62
RA1	<---	RA	0,772	0,60
RA2	<---	RA	0,797	0,64
RA3	<---	RA	0,754	0,57
RA4	<---	RA	0,64	0,41
RA5	<---	RA	0,634	0,40
IR1	<---	IR	0,841	0,71
IR2	<---	IR	0,843	0,71

Indicators		Construct/Indicator	Estimate	Quadrat Estimate
IR3	<---	IR	0,81	0,66
IR4	<---	IR	0,814	0,66
IRI5	<---	IR	0,843	0,71
IRI6	<---	IR	0,787	0,62
MSR1	<---	MSR	0,793	0,63
MSR2	<---	MSR	0,808	0,65
MSR3	<---	MSR	0,726	0,53
MSR4	<---	MSR	0,763	0,58
MSR5	<---	MSR	0,772	0,60

Two thousand seven hundred eighty-eight teachers in Indonesia were engaged as participants throughout various regions. The findings indicate the association between the five indicators (TR: teacher readiness regarding digital literacy and self-efficacy, PC: pedagogical abilities, RA: readiness in terms of attitude, IR: infrastructure readiness, MSR: management support readiness), and the concept of teacher readiness in online learning, the indicator of attitude demonstrates the most muscular explanatory power compared to the remaining four hands. The square of the factor loading (FL) on the readiness of attitude is 0.93, which indicates that the factor loading can account for 93% of the variance in the readiness of mentality. The attitudinal readiness of instructors in Indonesia has been identified as a significant factor influencing their readiness for online learning (Prior et al. 2016).

This study investigated the teachers' readiness in online learning: digital literacy- self-efficacy, pedagogical competence, attitude, infrastructure, and management support in Indonesia. We further tested the relations among the variables using SEM with AMOS. The significance of this research field stems from the notable phenomenon of teacher readiness. There is a pressing need for a more comprehensive understanding of the factors contributing to teachers' pedagogical competency, specifically teachers' self-efficacy, digital literacy, attitude, and managerial skills. The structural variables model was found to be explanatory based on the results obtained from the SEM analysis with AMOS. The empirical model, reporting standardized regression weights, is displayed in Figure 4.

The findings show the teachers' readiness in terms of attitudes, such as: teachers can provide many variations of learning in online learning; online learning applications are easy to use; teachers can collaborate with students in online learning; online learning makes me more creative in teaching. Even though the pandemic is over, the teachers will still use online learning in teaching.

Some findings supported this study, stating that the impact of school climate on work satisfaction was favourable, with self-efficacy acting as a partial mediator. The relationship between collective efficacy in student discipline and job satisfaction or burnout was not established to be significant. The presence of self-efficacy in managing one's behaviour has been found to have a favourable impact on an individual's level of job satisfaction (Malinen and Savolainen 2016). Education is a realistic effort wherein teaching is regarded as both an art and a science, encompassing a balanced amalgamation of information and abilities (Nurhikmah H, Abdul Saman, Pattaufi and Mawarni 2023). Nevertheless, it is essential to note that neither of these components alone is unsatisfactory (From 2017). The extent to which teachers' confidence in utilizing and implementing technology was influenced by their participation in continuous professional development interventions. This finding highlights the importance of persistent interventions in enhancing teachers' self-efficacy in effectively utilizing technology for professional purposes (Gomez et al. 2022).

The findings reported in this literature review contribute to advancing theoretical understanding of the intricate correlation between teachers' pedagogical views and educational advances, particularly concerning technology (Tondeur, Ertmer, and Quinn 2017). The constructs of teacher self-efficacy, academic self-efficacy, and computer self-efficacy have been identified as significant determinants in shaping the attitudes of prospective teachers towards adopting and utilizing computer-supported education.

A comprehensive understanding of teachers' self-efficacy beliefs necessitates consideration of environmental factors, as these beliefs are intricately intertwined with the surrounding context (Bandura 2010). The level of self-efficacy in online technologies appeared to be significantly increased (Ozerbas and Erdogan 2016). Disregarding the social context of teaching would undermine the effectiveness of teaching tasks. Our

comprehension of the motivational mechanisms suggests that they influence teachers' growth of their self-beliefs regarding their capabilities, engagement, and pleasure in the workplace (Granziera and Perera 2019). The present study results indicate a beneficial connection between school climate and teacher self-efficacy in management. They align with previous research that has also demonstrated a link between teachers' working conditions and their self-efficacy (Malinen and Savolainen 2016).

When examining the relationship between the five indicators (TR: Teacher readiness in terms of digital literacy and self-efficacy, PA: Pedagogical abilities, RA: Readiness in terms of attitude, IR: Infrastructure readiness, MSR: Management support readiness), and the concept of teacher readiness in online learning, the attitude indicator exhibits the highest level of explanatory capability in comparison to the other four hands. When squared, the factor loading (FL) on the readiness of attitude yields a value of 0.93. This indicates that the factor loading may explain a significant portion of the variability in the readiness of philosophy. The attitudinal preparedness of instructors in Indonesia plays a crucial role in determining their readiness for engaging in online learning.

4.2 The Attitude Readiness of Teachers in Indonesia Influence Teachers' Readiness for Online Learning

Questionnaires were administered to 2,788 participants to gather detailed information about the teachers' readiness in online learning: digital literacy- self-efficacy, pedagogical competence, attitude, infrastructure, and management support in Indonesia. These findings of the study show that the attitude readiness of teachers in Indonesia has been identified as a significant factor influencing their readiness for online learning.

Other research supports this study, stating that teacher readiness is vital for educational organizations and that pre-service teachers possess higher levels of teacher readiness and sufficiently positive attitudes (Polat 2022). The study's findings provide valuable insights for teachers and educational institutions in comprehending students' perspectives on online learning in uncommon situations (Hussein et al. 2020). According to a recent online survey conducted among a sample of 151 postgraduate business students, the findings indicate a noteworthy relationship between good student attitude and digital literacy, both of which have a major impact on self-efficacy (Prior et al. 2016). The participants had generally positive attitudes towards online learning, which further improved upon completion of the course. Additionally, the participants' sustained desire to engage in online learning was found to be significantly influenced by four self-regulatory characteristics and their attitudes towards the method of learning (Zhu et al. 2020).

The constructs of teacher self-efficacy, academic self-efficacy, and computer self-efficacy have been identified as significant factors in determining prospective teachers' attitudes towards the adoption and utilisation of computer-supported education. The computer and internet self-efficacy of students has a significant role in their preparation for online learning (Zhu et al. 2020). This readiness, in turn, has a mediated effect on various aspects of online learning, including views of the learning experience and scores in online discussions. Additionally, it also influences the overall happiness of students with the course (Wei and Chou 2020). Moreover, the level of preparation among teachers in utilizing internet technology appeared to be quite high. These findings emphasize the importance of providing support to instructors in improving their self-efficacy in managing student behavior.

In summary, this study makes four contributions. First, this study addresses a notable need in the field of online education by examining the impact of digital literacy and teachers' attitudes in Indonesia teachers' readiness. Second, this study examines the cascading impacts of teachers' attitude readiness on online learning. Third, the present study examines the impact of teachers' attitude readiness on many aspects of online learning, including pedagogical competence, infrastructure readiness, management support readiness, and teacher readiness. Fourth, the study provides valuable and constructive insights for both practical application and theoretical understanding.

4.3 The Practical Implication of this Study

The results of this current study indicate that every aspect of the indicator of attitude demonstrates the most muscular explanatory power compared to the remaining four variables, namely digital literacy-self-efficacy (TR-DLSE), pedagogical competence (PC), infrastructure readiness (IR), and management support (MS) in online learning in Indonesia. This study can be applied in online learning for educators and the field of teachers' education. In order to help users understand the importance of e-learning, teachers can modify the integration of e-learning by putting in place digital literacy-self-efficacy, pedagogical competence, infrastructure readiness, and management support in online learning. Those highlight the need to assist teachers in enhancing their self-efficacy in behaviour management. The degree to which Indonesian educators are prepared to participate in online learning is largely dependent on teachers' attitude. Furthermore, this research can be implemented in the digitalization of the education sector.

5. Conclusion

In Indonesia, similar to several other developing nations, it is vital to thoroughly deliberate on all issues about education, as education serves as a significant catalyst for progress. Moreover, educators have a critical role in this context. Educators' expertise, pedagogical skills, engagement with the students, and even their convictions can significantly impact the academic accomplishments of learners. All teachers as respondents participate in the study to conduct across various regions in Indonesia. The findings indicate that the association between the five indicators: teacher readiness in digital literacy-self-efficacy (TR-DLSE), pedagogical competence (PC), attitude readiness (AR), infrastructure readiness (IR), and management support (MS), and the concept of a teacher are ready in online learning, the indicator of attitude demonstrates the most muscular explanatory power compared to the remaining four variables. The squared factor loading (FL) on the readiness of attitude is 0.93, which shows that the factor loading can account for most of the variance in the preparedness of mentality. The attitudinal enthusiasm of instructors in Indonesia is a significant factor influencing their preparedness for online learning. The readiness of teachers, as regards their attitudes, include their ability to offer diverse learning options in the context of online learning. Additionally, it involves their proficiency in utilizing user-friendly online learning tools, as well as their capacity to engage in collaborative efforts with students inside the online learning environment. Engaging in online learning enhances pedagogical creativity. Despite the ending of the pandemic, educators will continue to utilize online learning as a pedagogical approach.

This study focuses on teachers' readiness in digital literacy-self-efficacy (TR-DLSE), pedagogical competence (PC), attitude readiness (AR), infrastructure readiness (IR), and management support (MS) in online learning. A recommendation for further researchers would be to investigate in depth the university students, education staff, and lecturers for the readiness of self-efficacy, digital literacy, attitude, and management for pedagogical competence in Indonesia in order to gain different results and to improve the results of this study. Moreover, future studies should use a larger research sample and look at additional characteristics not included in the variables of study that may impact online learning.

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