

Investigation the effect of readiness of teachers on student readiness in online learning: a study quantitative method

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Abstract

The COVID-19 pandemic precipitated a global and abrupt transition to online learning, making the readiness of teachers and students a central concern. This study aims to empirically investigate the effect of teacher readiness on high school students' readiness for online learning in the post-pandemic context in Indonesia. Employing a quantitative correlational approach, this research involved 407 teachers and 407 high school students from South Sulawesi Province. Data were collected using validated and reliable questionnaires measuring teacher readiness indicators—digital literacy & self-efficacy (X1), pedagogical ability (X2), attitude readiness (X3), infrastructure readiness (X4), and document management readiness (X5)—and student readiness indicators—digital literacy & self-efficacy (Y1), motivation (Y2), attitude (Y3), and gadget support (Y4). Data were analyzed using Pearson correlation, linear regression, and ANOVA F-test. The findings reveal a critical and counterintuitive result: teacher readiness, both collectively and individually, has no statistically significant effect on student readiness. Correlation coefficients between all X and Y indicators were negligible and non-significant ($p > 0.05$). Furthermore, regression analysis showed extremely low R-squared values, ranging from 0.003 to 0.015, indicating that the teacher readiness model explains only 0.3% to 1.5% of the variance in student readiness. The ANOVA F-tests confirmed the non-significance of these relationships (p-values from 0.297 to 0.952). This study concludes that in the post-pandemic era, student readiness for online learning is predominantly determined by factors beyond the direct influence of teacher readiness as measured. The implications suggest a need for a paradigm shift from focusing solely on teacher competency development to a more holistic, systemic approach that addresses the broader educational ecosystem, including student autonomy, family support, and institutional policies.

Keywords: online learning, self-efficacy, student motivation, students' readiness, teacher readiness.

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1. Introduction*

The COVID-19 outbreak was a major challenge for educational institutions. The education system has undergone significant changes in response to the complexities faced by teachers and students during the pandemic. Teaching methods are being redefined from the traditional face-to-face system to virtual learning. Online face-to-face based online learning is new normal during the pandemic era. The readiness of teachers and students to face sudden changes and schools being closed, and having to study at home has caused many students to be unprepared to accept this fact. Rapid transitions from face-to-face learning to online learning are happening all over the world (Agormedah et al., 2020; Cutri & Mena, 2020; Howard et al., 2021; Lee et al., 2023; Rauf et al., 2021; Sidi et al., 2023).

As the COVID-19 pandemic spreads, educational institutions in many countries have shifted to online learning. This learning transition has become the focus of various studies to identify factors that can affect students' readiness for online learning. As a result, there has been a great deal of published literature on this topic in recent days. Naji et al. (2020) found that four factors influence student readiness: 1) initial readiness and motivation for online learning (Dehghan et al., 2022; Rafique et al., 2021; Tang et al., 2021; Wei & Chou, 2020); 2) self-efficacy beliefs about online learning (Cigdam & Yildirim, 2014; Dogham et al., 2022; Howard et al., 2021); 3) independent online learning (Dogham et al., 2022); dan 4) support for online learning (Howard et al., 2021; Scherer et al., 2021, 2023). Deza Leon

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et al. (2020) found that students are receptive to getting an education in an online learning environment during the quarantine period from COVID-19. This research tries to measure the readiness of teachers and students in online learning after the pandemic. Is online learning still effective? It is thought that the readiness of teachers and students is still the same during the pandemic.

Online learning faces many challenges; with students and teachers separated in location during its implementation, lecturers can only indirectly supervise student's activities. Assurance that students take the teacher's comments seriously is uncertain. In their research, Szpunar et al. (2013) reported that students fantasize more often online than in face-to-face lectures. Therefore it is suggested that online learning should be held in a short time, considering that it is difficult for students to maintain concentration if online lectures are held for more than one hour (Khan et al., 2017). A study of engineering students for factors influencing their readiness for online learning during the COVID-19 pandemic (Naji et al., 2020). They found four factors that impacted their level of readiness: 1) initial alertness and motivation to learn, 2) self-efficacy about online learning, 3) online self-learning, and 4) support for online learning. With e-learning facilities, teachers can carry out learning flexibly in terms of time and place using the Learning Management System (LMS), where the presence of the parties involved is represented by e-mail, chat, or video conferencing (Navastara et al., 2020).

Howard et al. (2021) showed that women's readiness was higher than men's in cognitive activation practices. At the same time, men have higher self-efficacy in knowledge of technology content. On the other hand, findings at universities in Portugal show different findings with the linearity assumption "the more experienced, the more prepared." Researchers found strong evidence for a curved relationship. Teacher readiness for online learning increased first and then decreased inexperienced teacher respondents. This was found mainly in the dimensions of self-efficacy readiness. Further analysis suggests that the experience-readiness relationship exists not only at the level of the aggregate construct but also at the level of indicators, namely specific areas of knowledge, teaching, and support (Scherer et al., 2021, 2023). The readiness of students to learn is supported by instructions for implementing online learning, even though online learning-supporting technology is already available in schools (Afolabi, 2015). In addition to readiness for online learning, students' readiness to practice is significantly influenced by their self-esteem, job satisfaction, anxiety, and the learning environment (Lee et al., 2023). In addition, student motivation factors must be increased by providing facilities and infrastructure for practical activities (Dehghan et al., 2022). Blended learning research in Bangladesh aims to improve the quality of blended learning environments by addressing students' concerns about the various components of blended learning (Shakeel et al., 2023; Hasyim et al., 2024).

However, they also identified student challenges, such as lack of motivation, boredom during class, information overload, and lack of digital skills. In this regard, Kalkan (2020) examined students' readiness for online learning and found that computer, internet, and online communication skills were the top-ranking factors that significantly influenced students' online learning readiness, followed by independent learning, learning control, and motivation. Kalman et al. (2020) researched and concluded that adaptability, organizational skills, and self-awareness are personal characteristics that enable students to succeed and excel as online students. Keramati et al. (2011) findings indicate that organisational readiness, motivation, and teacher training factors have the most significant impact on online learning outcomes.

Rahman (2025) found that students with high levels of digital literacy skills and learning motivation tended to have more positive social attitudes. Furthermore, Ay et al. (2022) found that although female and male prospective teachers had similar levels of online learning readiness, the male group used technology significantly more than the female group. However, there were no significant differences in readiness or technology use based on grade variables. Overall, a positive and significant relationship of moderate strength was found between prospective teachers' level of online learning readiness and their frequency of technology use. Finally, Salayo et al. (2020) showed statistically significant differences between teacher and student readiness, attitudes, and competencies. Both teachers and students remained positive and resilient in the face of the academic challenges posed by the COVID-19 pandemic.

Based on relevant research, the researchers determined the variable of teacher readiness using indicators of digital literacy and self-efficacy, pedagogical ability, attitude readiness, infrastructure readiness, and document readiness management. These indicators were used because teacher readiness encompasses not only digital literacy skills but also attitudes and readiness for administration and online learning management. Meanwhile, student readiness is based on students' needs in terms of digital literacy, self-efficacy, motivation, and attitude towards online learning, as well as the support of gadgets in learning.

The formulation of the research problem is as follows: 1) How does teacher readiness influence the readiness of high school students in online learning in the post-pandemic? 2) How effective is teacher preparedness on high school students' readiness for post-pandemic online learning?

2. Research Methods

2.1. Participants

This quantitative research aims to explain the influence of teacher readiness on high school students' readiness to participate in online learning after the COVID-19 pandemic. Teacher readiness consists of digital literacy and self-efficacy indicators, pedagogical ability, attitude, infrastructure, and management support readiness. At the same time, student readiness consists of digital literacy and self-efficacy indicators, student motivation, student attitudes, and student support gadgets. This research involved 407 teachers and 407 high school students in the South Sulawesi province of Indonesia. The results of this analysis will provide a comprehensive mapping of the readiness level of high school teachers and students in online learning.

Table 1. Demographics of the study group teachers and students (n= 407)

Variable Teachers	f	%	Variable Students	f	%
Educational level			Class		
Bachelor	345	84.77	X	167	41.03
Master	62	15.23	XI	126	30.96
			XII	114	28.01
Age			Gender		
26-30	96	23.59	Female	126	30.96
31-35	83	20.39	Male	281	69.04
36-40	61	14.99			
41-45	66	16.22			
46-50	53	13.02			
51-55	34	8.35			
56-60	14	3.44			
Regency/city			Regency/city		
Luwu	20	4.91	Luwu	54	13.27
Pinrang	16	3.93	Pinrang	20	4.91
Soppeng	7	1.72	Soppeng	4	0.98
Bone	17	4.18	Bone	16	3.93
Barru	14	3.44	Barru	2	0.49
Pangkep	16	3.93	Pangkep	9	2.21
Makassar	56	13.76	Makassar	80	19.66
Gowa	32	7.86	Gowa	102	25.06
Takalar	82	20.15	Takalar	44	10.81
Jeneponto	9	2.21	Jeneponto	14	3.44
Bantaeng	15	3.69	Bantaeng	5	1.23
Bulukumba	14	3.44	Bulukumba	18	4.42
Selayar	10	2.46	Selayar	11	2.70
Sinjai	99	24.32	Sinjai	28	6.88

Table 1 illustrates the demographic profile of the 407 teachers and 407 high school students sampled in this study. In general, the majority of teachers (84.77%) held a Bachelor's degree, while the remainder held a Master's degree. In terms of age, the teacher respondents were relatively evenly distributed, with the 26-30 age group being the largest (23.59%), with the percentage decreasing with age. These teachers and students came from various districts/cities in South Sulawesi, with the highest concentration of teachers from Selayar Regency (24.32%) and students from Makassar City (25.06%). For students, respondents were spread relatively evenly across grades X, XI, and XII, with the gender composition dominated by women (69.04%).

2.2. Data collection

In the quantitative data collection session, the researcher used a questionnaire instrument for teachers with statements regarding indicators of digital literacy and self-efficacy, pedagogical abilities, attitude readiness, infrastructure readiness, and management support readiness. Student questionnaires include statements regarding indicators of digital literacy and self-efficacy, student motivation, student attitudes, and student support gadgets. The composite reliability value is calculated, and the resultant value of all dimensions (Byrne, 2011). Cronbach's alpha value is calculated to check whether each scale item's internal consistency and reliability match the value recommended by Hair et al., (2009). Before collecting the data as a whole in South Sulawesi Province, a small-scale instrument trial was first carried out, which was then analyzed to see the R count as a reference for the validity of each instrument item, and then a Cronbach alpha value was calculated to see the level of reliability.

2.3. Data analysis

Data collection for the quantitative phase took place between August and December 2022. The data collected from the questionnaires were analysed quantitatively with the help of the SPSS 25.00 application. In this quantitative analysis, the researcher ran several *Pearson Product Moment* simple correlation tests (Helaluddin et al., 2023; Supartini et al., 2020), the ANOVA F test (Sidi et al., 2023), and linear regression. The simple correlation test aims to determine the correlation of indicators for each teacher readiness variable and student readiness variables in online learning the post-pandemic. The linear regression equation indicates the influence of all teacher readiness variables on each student readiness variable.

3. Results and Discussion

3.1. Results

Table 2 is the average score (mean) and standard deviation of teacher readiness (X1-X5) and student readiness (Y1-Y4). Table 2 shows that the greater the average score, the greater the standard deviation.

Table 2. Mean value, standard deviation for each indicator of teacher readiness and student readiness in online learning

Indicator	Mean	Std. Deviation	N
Digital literacy and self-efficacy (X1)	31.1548	4.08266	407
Pedagogical Ability (X2)	24.1400	3.40060	407
Attitude readiness (X3)	14.2875	2.43201	407
Infrastructure Readiness (X4)	16.9361	3.14758	407
Document readiness management (X5)	14.3808	2.42014	407
Digital literacy and self-efficacy (Y1)	35.6511	5.73307	407
Motivation (Y2)	25.4103	3.81676	407
Attitude (Y3)	15.5749	3.21230	407
Supporting Gadgets (Y4)	19.3317	4.42458	407

Table 2 presents the mean and standard deviation for each teacher and student readiness indicator. For teacher readiness, the Digital Literacy and Self-Efficacy indicator (X1) had the highest mean score (31.15), while Attitude Readiness (X3) had the lowest score (14.29). For students, the Digital Literacy and Self-Efficacy indicator (Y1) also achieved the highest mean score (35.65) with the largest standard deviation (5.73), indicating that students' perceptions and abilities in this regard vary widely. Overall, the mean scores for student readiness indicators tended to be higher than those for teacher readiness indicators.

Based on Table 3, the research instrument used has excellent validity. All items measuring teacher readiness indicators (X1 to X5) are declared valid, because the Pearson correlation value (R Calculation) far exceeds the R Table value (0.361) with a significance of 0.000. For the Student Readiness Instrument, the majority of items are also valid. However, several items in the digital literacy and self-efficacy indicator (Y1), motivation (Y2), and gadget support (Y4) do not meet the validity criteria and are not used further.

Table 4 confirms that all of the instruments also have a high level of reliability. Cronbach's Alpha values for all indicators, for both teachers and students, were well above the 0.70 threshold, ranging from 0.797 to 0.962. This demonstrates that the questionnaire used was consistent and reliable in measuring the variables in this study.

Table 3. Validity Test of Instrument Indicators for Teacher Readiness (X) and Student Readiness (Y) Variables

Indicator	Pearson R Average Calculate	R Table (df=28) and significance level (0.05) 5%	Average Significance Value	Valid items from total instrument items
Digital literacy and self-efficacy (X1)	0.763	0.361	0.000	All Valid from a total of 10 items
Pedagogical Ability (X2)	0.847	0.361	0.000	All Valid from a total of 8 items
Attitude readiness (X3)	0.840	0.361	0.000	All Valid from a total of 5 items
Infrastructure Readiness (X4)	0.912	0.361	0.000	All Valid from a total of 6 items
Document readiness management (X5)	0.882	0.361	0.000	11 Valid items from a total of 13 items
Digital literacy and self-efficacy (Y1)	0.717	0.361	0.000	5 Valid items from a total of 9 items
Motivation (Y2)	0.769	0.361	0.000	All Valid from a total of 6 items
Attitude (Y3)	0.708	0.361	0.001	7 Valid items from a total of 8 items
Supporting Gadgets (Y4)	0.676	0.361	0.000	11 Valid items from a total of 13 items

Table 4. Reliability Test of Instrument Indicators for Teacher Readiness (X) and Student Readiness (Y) Variables

Indicator	Cronbach's Alpha	N of Items
Digital literacy and self-efficacy (X1)	0.914	10
Pedagogical Ability (X2)	0.940	8
Attitude readiness (X3)	0.889	5
Infrastructure Readiness (X4)	0.962	6
Document readiness management (X5)	0.927	5
Digital literacy and self-efficacy (Y1)	0.899	11
Motivation (Y2)	0.827	5
Attitude (Y3)	0.797	6
Supporting Gadgets (Y4)	0.817	7

Table 5. Correlation of indicators (X1-X5) to indicators (Y1-Y4)

Indicator	X1	X2	X3	X4	X5	Y1	Y2	Y3	Y4
X1 Pearson Correlation	1.000	.804	.681	.459	.473	-.003	-.029	.013	.021
X1 Sig. (1-tailed)	.000	.000	.000	.000	.000	.477	.282	.400	.334
X1 N	407	407	407	407	407	407	407	407	407
X2 Pearson Correlation	.804	1.000	.789	.547	.537	-.007	-.040	.008	.027
X2 Sig. (1-tailed)	.000	.000	.000	.000	.000	.477	.209	.438	.293
X2 N	407	407	407	407	407	407	407	407	407
X3 Pearson Correlation	.681	.789	1.000	.569	.625	-.020	.000	-.004	.001
X3 Sig. (1-tailed)	.000	.000	.000	.000	.000	.346	.500	.472	.492
X3 N	407	407	407	407	407	407	407	407	407
X4 Pearson Correlation	.459	.547	.569	1.000	.793	.026	.073	.042	.035
X4 Sig. (1-tailed)	.000	.000	.000	.000	.000	.297	.071	.198	.241
X4 N	407	407	407	407	407	407	407	407	407
X5 Pearson Correlation	.473	.537	.625	.793	1.000	.004	.053	.033	.036
X5 Sig. (1-tailed)	.000	.000	.000	.000	.000	.471	.142	.252	.233
X5 N	407	407	407	407	407	407	407	407	407

Table 5 shows the magnitude of the relationship between indicators of digital literacy and student self-efficacy with indicators of digital literacy and teacher self-efficacy calculated by the correlation coefficient is -0.003, while indicators of digital literacy and student self-efficacy with indicators of teacher pedagogical abilities are -0.007, indicators of digital literacy and student self-efficacy with indicators of teacher attitudes is -0.020, indicators of digital literacy and student efficacy with indicators of teacher infrastructure readiness are 0.026, indicators of digital literacy and student efficacy with indicators of teacher management documents are 0.004. Theoretically, the correlation between teacher infrastructure readiness (X4) to digital literacy and student self-efficacy (Y1) is more influential.

Table 6. R-squared value

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1 ^b	.053 ^a	.003	-.010	5.76066
2 ^c	.123 ^a	.015	.003	3.81150
3 ^d	.057 ^a	.003	-.009	3.22703
4 ^e	.060 ^a	.004	-.009	4.44395

a. Predictors: (Constant), Document management readiness (X5), Digital literacy and self-efficacy (X1), Attitude readiness (X3), Infrastructure readiness (X4), Pedagogical Ability (X2)

b. Dependent Variable: Digital literacy and self-efficacy (Y1)

c. Dependent Variable: Motivation (Y2)

d. Dependent Variable: student attitude (Y3)

e. Dependent Variable: student support gadget (Y4)

Table 7. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1 ^a	Regression	37.178	5	7.436	.224	.952 ^e
	Residual	13307.279	401	33.185		
	Total	13344.457	406			
2 ^b	Regression	88.941	5	17.788	1.224	.297 ^e
	Residual	5825.536	401	14.528		
	Total	5914.477	406			
3 ^c	Regression	13.562	5	2.712	.260	.934 ^e
	Residual	4175.902	401	10.414		
	Total	4189.464	406			
4 ^d	Regression	29.014	5	5.803	.294	.916 ^e
	Residual	7919.208	401	19.749		
	Total	7948.221	406			

a. Dependent Variable: Digital literacy and self-efficacy (Y1)

b. Dependent Variable: Motivation (Y2)

c. Dependent Variable: student attitude (Y3)

d. Dependent Variable: student support gadget (Y4)

e. Predictors: (Constant), Document management readiness (X5), Digital literacy and self-efficacy (X1), Attitude readiness (X3), Infrastructure readiness (X4), Pedagogical Ability (X2)

Table 5 shows the correlation coefficients between teacher and student indicators. The relationship between digital literacy and student self-efficacy (Y1) and the five teacher indicators (X1-X5) was very low, ranging from -0.020 to 0.026. Theoretically, the correlation with teacher infrastructure readiness (X4; 0.026) is considered the most influential. Similarly, for student motivation (Y2), all correlations with teacher indicators were low (-0.40 to 0.073). The highest correlation was with teacher infrastructure readiness (X4; 0.073), which is considered the most theoretically significant. For student attitudes (Y3), the correlation was also low (-0.004 to 0.042), with teacher infrastructure readiness (X4; 0.042) again being the strongest. For student learning aids (Y4), the correlation with teacher indicators was very low (0.001 to 0.036). However, the correlation with teacher management document readiness (X5; 0.036) is considered greater and more influential than the others. On the other hand, a robust correlation ($r = 0.804$) was found between two independent indicators: teacher pedagogical skills and digital literacy, as well as teacher self-efficacy. This indicates the presence of multicollinearity. The significance level for all tested

correlation coefficients was 0.000, which is well below 0.05, indicating that these relationships are highly statistically significant.

Table 6 shows that the R square number is 0.003. This means that 0.3% of digital literacy and student self-efficacy (Y1) can be explained by indicators X1-X5. The rest (100%-0.3%= 99.7%) is explained by other reasons. The R square number is 0.015. This means that 1.5% of student motivation (Y2) can be explained by indicators X1-X5. The rest (100%-1.5%= 98.5%) is explained by other reasons. The R square number is 0.003. This means that 0.3% of student attitudes (Y3) can be explained by indicators X1-X5. The rest (100%-0.3%= 99.7%) is explained by other reasons. The R square number is 0.004. This means that 0.4% of student support gadgets (Y4) can be explained by indicators X1-X5. The rest (100%-0.4%= 99.6%) is explained by other reasons.

In Table 7, the ANOVA or F test, the calculated F is 0.224 with a significance level of 0.952. Because the probability of 0.952 is much greater than 0.05, the teacher readiness indicator (X1-X5) has no significant effect on digital literacy and student self-efficacy (Y1). ANOVA test, or F test, obtained an F count is 1.224 with a significance level of 0.297. Because the probability of 0.297 is much greater than 0.05, the indicator of teacher readiness (X1-X5) has no significant effect on student motivation (Y2). ANOVA test, or F test, obtained an F count is 0.260 with a significance level of 0.934. Because the probability of 0.934 is much greater than 0.05, the indicator of teacher readiness (X1-X5) has no significant effect on student attitudes (Y3). ANOVA test, or F test, obtained an F count is 0.294 with a significance level of 0.916. Because the probability of 0.934 is much greater than 0.05, the teacher readiness indicator (X1-X5) has no significant effect on the student support gadget (Y4).

Table 8. Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	
	B	Std. Error	Beta			
1 ^a	(Constant)	35.566	2.354		15.106	.000
	Digital literacy and self-efficacy (X1)	.018	.119	.013	.154	.878
	Pedagogical Ability (X2)	-.002	.172	-.001	-.011	.991
	Attitude readiness (X3)	-.122	.209	-.052	-.585	.559
	Infrastructure Readiness (X4)	.130	.154	.071	.847	.397
	Document readiness management (X5)	-.062	.207	-.026	-.301	.764
2 ^b	(Constant)	25.708	1.558		16.503	.000
	Digital literacy and self-efficacy (X1)	-.002	.079	-.002	-.027	.978
	Pedagogical Ability (X2)	-.155	.114	-.138	-1.360	.175
	Attitude readiness (X3)	.055	.138	.035	.400	.689
	Infrastructure Readiness (X4)	.148	.102	.122	1.453	.147
	Document readiness management (X5)	.015	.137	.010	.112	.911
3 ^c	(Constant)	14.941	1.319		11.329	.000
	Digital literacy and self-efficacy (X1)	.016	.067	.020	.240	.810
	Pedagogical Ability (X2)	-.002	.097	-.002	-.019	.985
	Attitude readiness (X3)	-.076	.117	-.057	-.647	.518
	Infrastructure Readiness (X4)	.051	.086	.050	.591	.555
	Document readiness management (X5)	.028	.116	.021	.238	.812
4 ^d	(Constant)	18.044	1.816		9.935	.000
	Digital literacy and self-efficacy (X1)	.004	.092	.004	.045	.964
	Pedagogical Ability (X2)	.076	.133	.058	.571	.568
	Attitude readiness (X3)	-.151	.161	-.083	-.937	.349
	Infrastructure Readiness (X4)	.018	.119	.013	.155	.877
	Document readiness management (X5)	.081	.160	.045	.509	.611

a. Dependent Variable: Digital literacy and self-efficacy (Y1)

b. Dependent Variable: Motivation (Y2)

c. Dependent Variable: student attitude (Y3)

d. Dependent Variable: student support gadget (Y4)

Based on Table 8, the regression equations for each dependent variable (Y1 to Y4) show that only the constant is statistically significant (p-value = 0). All coefficients for the independent indicators (X1 to X5) have p-values > 0.025, indicating that none of these indicators have a significant effect on the dependent variable.

The regression equation is:

$$Y1 = 35.566 + 0.018X1 - 0.002X2 - 0.122X3 + 0.130X4 - 0.062X5$$

$$Y2 = 25.708 - 0.002X1 - 0.155X2 + 0.055X3 + 0.148X4 - 0.015X5$$

$$Y3 = 14.941 + 0.016X1 - 0.002X2 - 0.076X3 + 0.051X4 + 0.028X5$$

$$Y4 = 18.044 + 0.004X1 + 0.076X2 - 0.151X3 + 0.018X4 + 0.081X5$$

The t-test results confirm that the indicators X1 to X5 do not have a significant influence on Y1, Y2, Y3, or Y4.

Equation: $Y1 = 35.566 + 0.018X1 - 0.002X2 - 0.122X3 + 0.130X4 - 0.062X5$. The model suggests that a student's digital literacy and self-efficacy (Y1) have a baseline score of 35.566 when all teacher factors are zero. The coefficients for the teacher variables are minuscule and statistically insignificant. For instance, while Infrastructure Readiness (X4) shows a slight positive relationship (0.130), and Teacher Attitude (X3) shows a slight negative one (0.122), these effects are so weak and unreliable that they are effectively meaningless. The model fails to explain the variation in students' digital confidence.

Equation: $Y2 = 25.708 - 0.002X1 - 0.155X2 + 0.055X3 + 0.148X4 - 0.015X5$. This is an exciting result. The constant of 25.708 represents a student's baseline level of motivation. Notably, the coefficient for pedagogical ability (X2) is negative (0.155), the strongest (though still insignificant) negative value in all models. This counterintuitive finding suggests a potential disconnect; in this specific context, increased teacher pedagogical readiness does not translate into, and might even slightly correlate with, lower student motivation. This could occur if teachers' pedagogical approaches in an online environment are misaligned with what motivates students, leading to disengagement.

Equation: $Y3 = 14.941 + 0.016X1 - 0.002X2 - 0.076X3 + 0.051X4 + 0.028X5$. Similar to the other models, the influence of teacher readiness on student attitude is negligible. The baseline attitude score is 14.941. The very small coefficients indicate that changes in teachers' digital skills, pedagogy, or attitude have no statistically demonstrable impact on whether students have a positive or negative attitude toward online learning.

Equation: $Y4 = 18.044 + 0.004X1 + 0.076X2 - 0.151X3 + 0.018X4 + 0.081X5$. This model attempts to explain the adequacy of students' learning devices. The results confirm that this practical aspect of student readiness is not influenced by the teacher-level factors measured in this study. The readiness of a student's gadget is determined by factors entirely outside this model.

3.2. Discussion

This study aims to determine the effect of teacher readiness on student readiness in online learning during the COVID-19 period. Tables 5 and 7 show that the relationship between each indicator variable for teacher readiness has no significant effect on each indicator for high school student readiness variables. Teacher readiness in terms of infrastructure readiness has more influence on student readiness regarding digital literacy and self-efficacy, student motivation, and student attitudes. The readiness of teacher infrastructure is more influential than other indicators of teacher readiness. Teachers who prepare online learning infrastructure influence student readiness for online learning.

Teachers' readiness in learning technology could be more optimal than lecturers' readiness in tertiary institutions. Research by Tang et al. (2021) shows that students studying at higher educational degree levels have higher expectations of academic achievement and differ significantly in their readiness to learn online. Therefore, high school teachers need to increase their readiness to use technology with various learning technology platforms such as e-learning and the like (Linjawi & Alfadda, 2018; Wagiran et al., 2022). Both teachers and students must have basic skills in using technology, learning flexibility, and learning management (Almusawi et al., 2021; Shakeel et al., 2023). Teacher readiness in using learning technology that suits students' needs helps with online learning readiness (Firat & Bozkurt, 2020). Teacher readiness regarding low digital literacy has a low influence on student readiness. Research recommends that providing integrated digital literacy development across institutions focusing on accessing, assessing, and incorporating online resources into their work will help improve teacher and student readiness (Ahmed & Roche, 2021).

In Table 5, the regression equation for the effect of teacher readiness on digital literacy and student self-efficacy shows a constant of 35.66 will experience a decrease in the value of student readiness which is not significant. This means that increasing teacher readiness in online learning does not significantly impact student readiness. Teacher readiness in terms of literacy and self-efficacy has a low impact on student-teacher literacy and self-efficacy readiness. Meanwhile, research by Li & Yu (2022) explains that teachers must have adequate digital literacy to meet the new needs of today's innovative educational models in the future. In addition, this study reveals that teachers'

digital literacy levels, career satisfaction, and professional roles are significantly correlated. Further research by Öngören (2021) states a moderate and positive relationship between digital literacy and the level of readiness to teach. Thus, a positive relationship between digital literacy and teacher readiness in online learning can be achieved.

Teacher pedagogical abilities, teacher attitudes, and management readiness in online learning negatively value student motivation. Table 6, the regression equation shows that the teacher's attitude in learning contributes more than the teacher's pedagogical ability and management readiness. Research by Dehghan et al. (2022), student readiness in e-learning learning is lowest on the motivational dimension compared to digital access and online discussion. Teacher pedagogical abilities and attitudes must be improved for teacher readiness in online learning. Implementing online learning in teacher training effectively prepares teachers' readiness for online learning (Ho et al., 2023).

This study has a negative regression value on the teacher's attitude indicator. Teacher attitudes affect the value of digital literacy indicators and self-efficacy, student attitudes and student support gadgets. However, the teacher's attitude is positive for student motivation in online learning. In addition, the readiness of learning infrastructure provides a greater correlation to student motivation. According to research by Geng et al. (2019), the learning environment facilitates students' social engagement in class and online. Student technology readiness plays a stronger role in influencing teaching presence in the classroom and online environments.

This study also highlights teachers' pedagogical abilities and attitudes toward online learning, which are not significant to students' attitudes. Teachers should be more creative in using learning technology to provide a comfortable atmosphere so students' attitudes are active and they enjoy online learning. Teachers also need to motivate to learn digital literacy and self-efficacy to engage in online discussions and have fun in online learning. Wei & Chou (2020) shows that students' self-efficacy in computer/Internet learning for online learning readiness has a positive effect on perceptions of online learning and online discussions and perceptions of online learning and course satisfaction.

The readiness of school infrastructure for online learning is essential because it is a crucial part of online learning. Teacher readiness for online learning and understanding and applying technology is the most important part of supporting student readiness for online learning. Opinion of Cutri & Mena (2020), teacher readiness in online learning is tested professionally, experience, and teaching culture, which must switch to online learning. Online learning now and in the future needs to be improved because online learning can open up more opportunities to integrate learning technology into innovative online learning.

The statistical analysis results presented in Tables 5 to 8 present a counter-intuitive and critical finding that warrants further study. Contrary to common assumptions and much previous literature, the five dimensions of teacher readiness—digital literacy, self-efficacy, pedagogical skills, attitudes, and infrastructure and management support—were shown to have no statistically significant effect on student readiness, either collectively (Tables 6 and 7) or individually (Table 8). The very low R-square values (0.3% - 1.5%) strongly indicate that the teacher readiness model developed in this study almost completely fails to explain the variation in student readiness. In other words, 99.7% of the determinants of student readiness come from factors outside the measured teacher readiness variables.

This finding leads to two major, profound interpretations. First, it is possible that in the post-pandemic era, student readiness for online learning has become a much more complex and autonomous phenomenon. Factors beyond teachers' control, such as students' intrinsic motivation, family support, the home learning environment, friendship dynamics in online learning groups, and overall school policies and culture, may have become much stronger determinants. Students may have adapted and developed their own learning strategies, making the teacher's direct role in the context of readiness less dominant than it was at the beginning of the transition to the emergency. Second, these findings can also serve as a critical reflection on the quality of teacher readiness itself. Although the research instruments were found to be valid and reliable (Tables 3 & 4), and the average teacher readiness scores appear quite high (Table 2), what is being measured may be superficial or technical readiness. True readiness—the kind capable of sparking change in students—may lie in more transformative aspects, such as the ability to design truly engaging online learning experiences, the skills to build digital learning communities, or the capacity to provide personalized and meaningful feedback in virtual spaces. The five indicators used (X1-X5) may not fully capture the essence of “readiness” in a more holistic sense and with a direct impact on students.

The direct effect of teacher readiness on student readiness, as measured in this study, is non-existent. This does not mean teachers are unimportant. Instead, it suggests that their influence is not direct and is likely mediated or moderated by other variables, much like the organizational example you provided. Teacher readiness (X1-X5) may not have a direct effect on student readiness (Y1-Y4), but it can affect student outcomes by influencing other critical

mediators. For instance, a teacher's digital literacy (X1) does not directly raise a student's motivation (Y2). However, digital literacy enables teachers to create engaging, interactive content (the mediator), which directly boosts student motivation. This study measured the direct path (X1 > Y2) and found it broken, but it did not test for the mediated path (X1 > Quality of Content > Y2). Keramati et al. (2011) demonstrate that organisational factors, such as management permanence and organisational rules, cannot have a direct effect on e-learning outcomes; however, these factors can indirectly influence e-learning outcomes. The moderating effect of social readiness factors implies that some social factors (such as government regulations) cannot play a direct role in e-learning outcomes. However, these factors can influence the strength of this relationship. On the other hand, some technical factors (such as school space) do not have a direct impact on teacher productivity, but better environmental conditions will indirectly influence e-learning outcomes.

The slightly negative coefficient for Pedagogical Ability (X2) on Motivation (Y2) could be explained if teachers with high pedagogical knowledge are applying traditional methods that fail online, creating frustration. Their readiness is not being effectively translated into a format that motivates students in a digital environment. The regression results compel a move beyond simple direct effect models. The relationship between teacher and student readiness in online learning is not a straightforward pipeline. Future research must explore the indirect pathways and mediating variables—the “how” and “through what”—that connect teacher competencies to tangible outcomes in the complex, multilayered ecosystem of post-pandemic online education.

Therefore, the insignificance of this relationship should not be seen as a failure of teachers, but rather as a gateway to broadening the research and policy paradigm. The practical implication is that interventions to improve online learning readiness can no longer focus solely on isolated teacher training. A systemic approach is needed that targets the entire educational ecosystem, including empowering parents, strengthening counselling for student motivation, and creating school policies that support digital wellbeing for the entire school community. Furthermore, future measures of teacher readiness need to be developed to encompass deeper and more contextual competencies that can directly create engagement and encourage student independence in digital learning.

4. Conclusion

This study empirically investigated the relationship between teacher readiness and high school student readiness for online learning in the post-pandemic context of Indonesia. Based on the quantitative analysis, it is concluded that teacher readiness, as measured by indicators of digital literacy, self-efficacy, pedagogical ability, attitude, infrastructure, and document management, does not have a statistically significant direct influence on the readiness of high school students for online learning in the post-pandemic era. The correlation and regression analyses showed negligible and non-significant relationships between all teacher and student readiness indicators, with regression models explaining only 0.3% to 1.5% of the variance in student readiness. Consequently, teacher preparedness is not practical in directly enhancing student readiness under the current conditions and measurement framework. These findings suggest that student readiness in the post-pandemic period is primarily shaped by factors beyond teachers' direct influence, including student autonomy, motivation, family support, and broader institutional contexts. Therefore, improving online learning readiness requires a paradigm shift toward a more systemic and holistic approach, integrating teacher development with strategies that address student-level and contextual supports within the educational environment.

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