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The Influence Of Digital Literacy And Teacher Pedagogic Competence On Learning Innovation In Vocational High Schools In Sekayu District

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Abstract

Learning innovation is an important factor in improving the quality of education in Vocational High Schools (SMK), especially in facing the development of digital technology and the demand of 21 st - century competencies. However, teachers' ability to develop in innovative learning still needs to be improved by strengthening digital literacy and pedagogical competence. This study aims to analyze the influence of digital literacy and pedagogical competence of teachers on learning innovation at SMK in Sekayu Distict , both partially and simultaneously. This study uses a quantitative approach with a descriptive design Ex post facto. The research sample consists of 138 vocational high school teachers in Sekayu District, determined by total sampling technique. Data were collected through a Likert scale questionnaire and analyzed using the SPSS program through analysis requirements testing and hypothesis testing. The results showed that digital literacy had a positive and significant effect on learning innovation with a correlation coefficient of 0.781 and a sig value 0f 0.000 < 0.05. Teacher pedagogical competence also has a positive and significant effect on learning innovation with a correlation coefficient of 0.782 and a sig value of 0.000 < 0.05. Simultaneously , digital literacy and pedagogical competence had a significant effect on learning innovation with a contribution of 63.9%. These findings indicate that increasing digital literacy supported by pedagogical competence can encourage the creation of more innovative, creative, and relevant learning to educational needs.

Keywords: Digital Literacy; Pedagogical Competence; Learning Innovation; Vocational High School Teachers; Innovative Learning.

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INTRODUCTION

Education is the main pillar in increase quality source Power human beings and realize objective development national . Law Number 20 of 2003 concerning The National Education System affirms that education aim develop potential participant educate to become a person who is faithful , has character , is intelligent , and has required skills in life The achievement of these national education goals cannot be separated from the role of teachers as the main actors in the learning process .

According to Constitution number 14 of 2005 regarding with teachers and lecturers , teachers are power professionals who have role strategic in determine quality of process and results learning . In global scale , the realm of education now face to face with challenge big along with presence Revolution Industry 4.0 and Society 5.0 are marked with development digital technology , automation , intelligence artificial , and integration system cyber-physical . Change This demanding the world of education For do transformation in a way systemic , in particular in practice learning .

School Intermediate Vocational (SMK) as unit readiness - oriented education Work graduate of sued For always adaptive to development technology and the needs of the Business and Industrial World (DUDI). In addition demands transformation education in the digital era, conditions employment graduate of School Intermediate Vocational (SMK) also becomes attention important . Data from the Central Statistics Agency (BPS) shows that vocational school graduates still become contributor level unemployment open highest compared to graduate of level education others . In February 2025, the level of unemployment registered vocational school graduates reached 8.00%. Condition the indicates that the learning process in vocational schools is still need strengthening to be able to produce graduates who have competence in accordance with needs of the world of work and development industry that continues changed . This show that Still there is gap between competencies possessed vocational school graduates with competencies needed by the business world and the industrial world . One of them suspected factors contribute to condition the is Not yet optimal learning process that is capable of develop skills 21st century , such as think critical , creativity , communication , collaboration , and ability adaptation to development technology . Therefore that , the increase quality learning through innovation learning become urgent needs for vocational schools

Learning innovation is key to addressing these challenges. Learning innovation is crucial because it creates a more effective, creative, and relevant learning process tailored to students' needs. However, learning practices still tend to rely on conventional approaches and fail to utilize

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digital technology optimally. Consequently, learning fails to fully develop the critical thinking, creativity, communication, and collaboration skills required for 21st-century competencies, consistent with the 4.0 and 5.0 industrial revolutions.

Learning innovation is key to addressing these challenges. Learning innovation in vocational schools encompasses not only the use of the latest technology but also updates to approaches, methods, media, and evaluation systems that integrate students' cognitive, affective, and psychomotor aspects. Rogers (in Sahin, 2023) emphasized that innovation is not merely novelty, but rather the process of adopting ideas, practices, or objects perceived as new to increase effectiveness. However, in practice, learning innovation in vocational schools in Sekayu District tends to be partial and unsustainable, resulting in innovations in the learning process that have not developed systematically. This situation indicates that there are still factors hindering the development of learning innovation in schools. Learning innovation is a crucial instrument in improving the quality of the teaching and learning process and producing graduates who are better prepared to face the challenges of the workplace. Therefore, it is necessary to identify factors that have the potential to influence the success of learning innovation, particularly those originating from teacher competency as the primary implementers of the educational process.

However, learning innovation cannot be realized automatically without the support of adequate teacher competency. One key factor influencing learning innovation is teacher digital literacy. The ability to use technological devices is not the only aspect of digital literacy; it also includes critical thinking skills in accessing, evaluating, producing, and distributing information through digital media. In the context of vocational high school learning, digital literacy is a crucial competency because teachers are required to be able to utilize technology as a means to create interactive, creative, and student-centered learning. However, rapid technological developments have not always been accompanied by teachers' ability to effectively integrate digital technology into the learning process. Ahyani et al. (2024) suggest that digital literacy plays a strategic role in improving the quality of the learning process. Teachers' ability to access, understand, evaluate, and utilize digital technology appropriately can encourage innovative, student-centered learning and increase student engagement during learning activities. These findings indicate that mastery of digital literacy functions not only as a technical skill but also as a crucial factor in supporting successful learning in the digital era. Similarly, Kurniawati et al. (2022) showed that teachers with high levels of digital literacy are more adaptable in integrating Learning Management Systems (LMS), interactive media, and artificial intelligence technology into their learning, ultimately driving instructional innovation. However, the use of digital technology in learning has not been

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fully integrated pedagogically, so the technology used does not fully support effective learning strategies.

Similarly, teacher pedagogical competence remains a key focus in the learning context. Pedagogical competence is a teacher's ability to effectively design, implement, and evaluate learning according to student characteristics. Sari and Prayitno (2021) stated that teachers with strong pedagogical competence are able to transform a normative curriculum into a creative, contextual, and innovative learning experience. Consistent with this opinion, Soraya et al. (2025) found that the use of technology in learning supported by teacher pedagogical competence has a greater impact on improving learning quality. In other words, technology will give optimal benefits if supported by competence adequate pedagogy . Findings This show that success learning No only determined by mastery technology , but also by the teacher's ability in managing the learning process in a way pedagogical. However , in reality , competence teacher pedagogy not yet fully support innovative and contextual learning , so that the learning process is implemented Still Not yet fully push creativity and engagement participant educate optimally . Phenomenon the show that mastery digital technology and competencies pedagogy No can separated in create innovative learning . Teachers do not only sued capable use digital technology , but also must capable integrate technology the to in effective learning strategies in accordance with characteristics participant education . Imbalance mastery second competence the potential hinder creation creative , adaptive , and relevant learning with need education 21st century .

Urgency study This the more reinforced by the findings empirical from various study previously . Siti Aliyah's research (2019) proves that that influential teacher digital literacy significant to quality learning . Ahmad Mashun (2021) found that competence pedagogy give contribution by 32.30% against quality learning . Sari's research (2022) at Palembang City State Vocational Schools showed that digital literacy contributes by 38.6% against learning media innovation . Research latest by Hidayat et al . (2023) even show that digital literacy and competency pedagogy in a way simultaneous give very significant influence to innovation learning in the Society 5.0 era.

In the District Sekayu Musi Banyuasin Regency , SMK has role strategic in print power Work skilled and ready compete . However , based on observation beginning Still found existence inequality teacher's ability in integrate technology and implement competence pedagogy optimally . Conditions the show that synergy between digital literacy and competency teacher pedagogy in push innovation learning not optimal, so that learning innovative Not yet can develop in a way maximum . Based on phenomenon said , can identified that problem main problems faced

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by vocational schools in the sub-district Sekayu is Not yet optimally innovation alleged teacher learning caused by the ability digital literacy and competency pedagogy that has not been develop in a way balanced . Problems This become very important because in the middle rapid development digital technology and the demands of the world of work 21st century , teachers are required No only capable utilise technology , but also capable manage learning in a way effective so that technology the give impact real to improvement quality learning . If one competence the Not yet develop optimally , then innovation expected learning difficult come true in a way maximum .

Besides that , based on study study previously , some big study Still study influence digital literacy and competency pedagogy in a way separated to quality learning . Research that analyzes second variables the in a way simultaneous to innovation learning in context education vocational , especially in the District Vocational School Sekayu , still relatively limited . In fact , the characteristics of vocational schools are oriented towards readiness Work graduate of need approach differentiated learning compared to unit education others .

RESEARCH METHODS

Study This arranged with use approach quantitative in nature explanatory approach the chosen Because study This directed For explain influence between the variables studied , in particular influence variables free to variables bound . In implementation , research This use type study survey with ex post facto design , namely research that examines connection intervariable without give treatment direct to subject research (Sugiyono , 2022). Research design This use equality analysis multiple linear regression and in form questionnaire scale five- level Likert scale, starting from very to very agree to strongly agree . Use questionnaire Likert scale aims For obtain quantitative data that represents perception and attitude respondents in a way systematic and measurable .

Population research This is all vocational school teachers in the sub- district Active Sekayu teaching in the year academic year 2025/2026. Research This use total sampling technique saturated , so that amount sample The same with amount population (all member population made into respondents). With Thus , the sample study This is all vocational school teachers in the sub- district Sekayu totaling 138 people. In study this method following used For collect data, namely observation , questionnaires , and documentation . In study This , the data analysis used is statistics inferential . For inferential statistical tests prerequisite tests were carried out namely normality test , linearity test , multicollinearity test and heteroscedasticity test .

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RESULTS AND DISCUSSION

Testing Condition Data analysis

Testing prerequisite data analysis was carried out before testing hypothesis For ensure that the research data fulfil assumptions base in analysis statistics . The data requirements test carried out namely normality test , multicollinearity test and heteroscedasticity test .

1. Normality Test

Table 1. Results of the Digital Literacy Normality Test

Tests of Normality						
	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Digital Literacy	,058	138	,200 *	,985	138	,121
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

Source : SPSS output (processed data) researcher , 2026)

From the table test results that have been served previously , obtained mark The Kolmogorov-Smirnov significance value was 0.200. This value indicates that the data on the teacher digital literacy variable (X1) is normally distributed because the significance value is greater than 0.05. Thus, the data meets the assumption of normality. The results of the normality test are as follows.

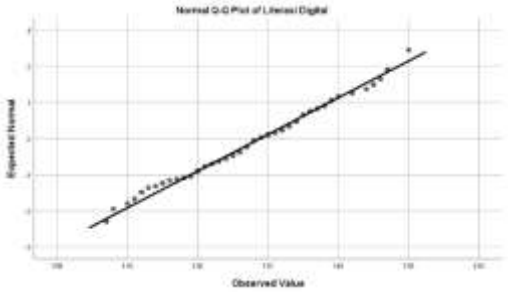


Figure 1. QQ Plot of Digital Literacy

The QQ plot of the digital literacy variable shows that the data points generally follow a diagonal line. The slight deviation in the tails of the distribution is still within reasonable limits, so the data can be considered close to a normal distribution. Thus, the digital literacy variable meets

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the assumption of normality.

Table 2. Results of the Normality of Teacher Pedagogical Competence (X2)

Tests of Normality						
	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	df	Sig.
Competence Teacher Pedagogy	,070	138	,099	,984	138	,096
a. Lilliefors Significance Correction						

Source : SPSS Output (Data processed researcher , 2026)

Kolmogorov-Smirnov test results on show mark significance is 0.099. This value exceeds 0.05, so the data for the teacher pedagogical competence variable (X2) is declared normally distributed. Thus, the assumption of normality for this variable has been met, as confirmed by the following graph:

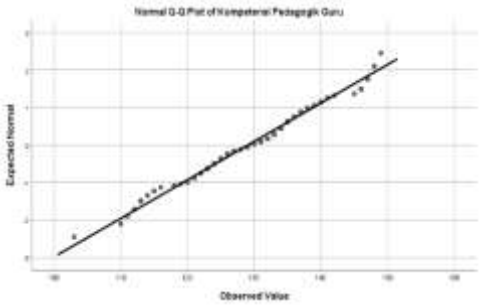


Figure 2. QQ Plot of Teacher Pedagogical Competence

From the results QQ Plot variable graph competence teacher pedagogy shows that data points follow direction of the diagonal line. This shows that the data from variable (X2) is normally distributed.

Table 3. Results of the Normality Test of Learning Innovation

Tests of Normality						
	Kolmogorov-Smirnov [a]			Shapiro-Wilk		
	Statistics	df	Sig.	Statistics	Df	Sig.
Innovation Learning	,074	138	,060	,984	138	,102

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a. Lilliefors Significance Correction

Source : SPSS Processing Results , Researcher (2026)

The Kolmogorov-Smirnov test have been presented , obtained mark significance of 0.060. This value is above the 0.05 significance level, indicating that the data on the learning innovation variable (Y) can be declared normally distributed. Thus, the learning innovation variable meets the assumption of normality. This is further clarified in the following graph.

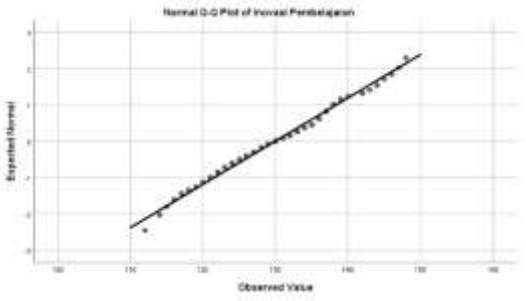


Figure 3. QQ Plot of Learning Innovation

Based on QQ Plot variable graph innovation learning show that part big data points follow The direction of the diagonal line. Small deviations in certain areas are still acceptable, so the data is considered to have a distribution pattern that is close to normal and meets the assumption of normality.

2. Linearity Test

Table 4. Digital Literacy Linearity Test

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Innovation Learning * Digital Literacy	Between Groups	(Combined)	7033,616	38	185,095	6,876	,000
		Linearity	5921,658	1	5921,658	219,996	,000
		Deviation from Linearity	1111,958	37	30,053	1,116	,327
	Within Groups		2664,798	99	26,917		
	Total		9698,413	137			

Source : SPSS Output Results (Data processed by researcher , 2026)

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Based on from table Anova above show that mark significance *Deviation from Linearity* of 0.327. This value is > 0.05, so can concluded that there is a linear relationship between variables teacher digital literacy (X1) and competency professional teacher (Y).

Table 5. Linearity Test of Teacher Pedagogical Competence

ANOVA Table							
			Sum of Squares	df	Mean Square	F	Sig.
Learning Innovation * Teacher Pedagogical Competence	Between Groups	(Combined)	7181,500	37	194,095	7,712	,000
		Linearity	5936,430	1	5936,430	235,862	,000
		Deviation from Linearity	1245,070	36	34,585	1,374	,111
	Within Groups		2516,913	100	25,169		
	Total		9698,413	137			

Source : SPSS Output Results (Data processed by researcher , 2026)

Based on table above , value significance from the deviation from linearity of 0.111. This show that existence linear correlation between innovation learning (X2) and innovation Learning (Y) is due to sig value more big from 0.05.

3. Multicollinearity Test

Table 6. Multicollinearity Test Results

Coefficients [a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	39,523	5,870		6,733	,000		
	Digital Literacy	,344	,109	,403	3,150	,002	,164	6,108
	Competence Teacher Pedagogy	,357	,110	,414	3,239	,002	,164	6,108
a. Dependent Variable: Innovation Learning								

Source : SPSS Output Results (Data processed Researcher , 2026)

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Based on results testing multicollinearity above , shows that mark *Tolerance* from all over variables Good That variables digital literacy as well as competence teacher pedagogy is 0.164, meaning mark this > 0.10 and while For VIF value of each of the variables on which is 6.108 meaning < 10. So it can be concluded that No there is indication multicollinearity in the regression model , so that the model meets one of the requirements assumptions classic .

4. Heteroscedasticity Test

Table 7. Heteroscedasticity Test Results

Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,031	3,918		,773	,441
	Digital Literacy	-,014	,073	-,040	-,187	,852
	Competence Teacher Pedagogy	,019	,074	,056	,261	,794

Source : SPSS Output Results (Data processed Researcher , 2026)

Based on the results shown in the table , the values Glejser test significance For variables teacher digital literacy (X1) is 0.852, while variables Competence teacher pedagogy (X2) obtained mark significance of 0.794. Both values are above the significance limit of 0.05, so it can be concluded that the regression model does not experience symptoms of heteroscedasticity . strengthen results testing said , the analysis can also be equipped with observation to pattern distribution points on the following scatterplot .

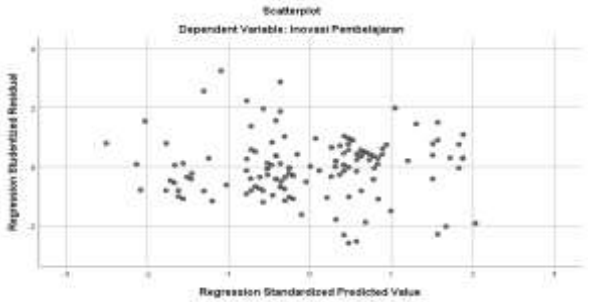


Figure 4. Scatterplot of Heteroscedasticity Test

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Seen from scatterplot graph above , that dot, dot, dot spread in a way random as well as spread above and below the number 0 on the Y axis , so can concluded that No happen heteroscedasticity in regression models .

Testing Hypothesis

Testing hypothesis in study quantitative can done if the data obtained has fulfil condition specified analysis . In study here , there is three the proposed hypothesis For tested , namely :

Hypothesis 1 : Digital literacy influences innovation in vocational school learning in Sekayu District

Hypothesis 2 : Teachers' pedagogical competence influences learning innovation in vocational schools in Sekayu sub-district.

Hypothesis 3 : Digital literacy and teacher pedagogical competence jointly influence learning innovation in vocational schools in Sekayu district.

a) Correlation Test

Table 8. Results of the Correlation Test of X1 and Y

Correlations			
		Digital Literacy	**Innovation Learning**
Digital Literacy	Pearson Correlation	1	,781 **
	Sig. (2-tailed)		,000
	N	138	138
Innovation Learning	Pearson Correlation	,781 **	1
	Sig. (2-tailed)	,000	
	N	138	138
**. Correlation is significant at the 0.01 level (2-tailed).			

Source : SPSS Output Results (Data processed Researcher , 2026)

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Table 9. Results of the Correlation Test of X2 and Y

Correlations			
		Competence Teacher Pedagogy	Innovation Learning
Competence Teacher Pedagogy	Pearson Correlation	1	,782 **
	Sig. (2-tailed)		,000
	N	138	138
Innovation Learning	Pearson Correlation	,782 **	1
	Sig. (2-tailed)	,000	
	N	138	138
**. Correlation is significant at the 0.01 level (2-tailed).			

Source : SPSS Output Results (Data processed Researcher , 2026)

For know level strength connection intervariable based on mark coefficient correlation , required reference clear interpretation . Guidelines the used For determine whether connection intervariable are in the categories of very low , low , moderate , strong , or very strong .

From the table above, the correlation coefficient between the variables Digital Literacy (X1) and Learning Innovation (Y) is 0.781. Meanwhile, the correlation coefficient between the variables Teacher Pedagogical Competence (X2) and Learning Innovation (Y) is 0.782. It can be interpreted that each shows a strong correlation between the two variables.

b) Multiple Linear Regression Test

Table 10 Multiple Linear Regression X1, X2 and Y

Coefficients [a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	]VIF
1	(Constant)	39,523	5,870		6,733	,000		
	Digital Literacy	,344	,109	,403	3,150	,002	,164	6,108

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	Competence Teacher Pedagogy	,357	,110	,414	3,239	,002	,164	6,108
a. Dependent Variable: Innovation Learning								

Source : SPSS Processing Results , Researcher (2026)

c) Coefficient Test Determination

Table 11. Coefficient Results Determination

Model Summary [b]				
Model	**R**	**R Square**	**Adjusted R Square**	**Standard Error of the Estimate**
1	,799 [a]	,639	,633	5,095
a. Predictors: (Constant), Teacher Pedagogical Competence, Digital Literacy				
b. Dependent Variable: Innovation Learning				

Source : SPSS output (processed data) researcher , 2026)

Based on results analysis coefficient determinant , obtained mark *R Square* of 0.639. Findings This indicate that contribution variables digital literacy and skills teacher pedagogy towards innovation learning is by 63.9%. Meanwhile that , the remaining 36.1% influenced by other outside factors research that is not become focus study this . The value show that study This show level sufficient ability tall in explain innovation learning .

d) T-test

Table 12. T-test on variable X1 against Y

Coefficients [a]								
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**t**	**Sig.**	**Collinearity Statistics**	
		B	**Std. Error**	**Beta**			**Tolerance**	**VIF**
1	(Constant)	43,854	5,912		7,418	,000		
	Digital Literacy	,668	,046	,781	14,603	,000	1,000	1,000

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a. Dependent Variable: Innovation Learning

Source : SPSS Output Results (Processed) Researcher , 2026)

Based on the results of the table above, namely the results of the t test show that the sig value of the influence of digital literacy (x1) on learning innovation (y) is 0.000 <0.05 and the calculated t value is 14.603> the t table value of 1.656. So Ho1 is rejected and Ha1 is accepted. So it means that there is a significant influence of digital literacy on learning innovation.

Table 13. T-Test on Variable X2 against Y

Coefficients [a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	42,933	5,956		7,209	,000		
	Competence Teacher Pedagogy	,674	,046	,782	14,650	,000	1,000	1,000
a. Dependent Variable: Innovation Learning								

Source : SPSS Output Results, Researcher (2026)

Based on the results of the table above, namely the results of the t test show that the sig value of the influence of teacher pedagogical competence (X2) on learning innovation (y) is 0.000 <0.05 and the calculated t value is 14.650> the t table value of 1.656. So Ho2 is rejected and Ha2 is accepted. So it means that there is a significant influence of teacher pedagogical competence on learning innovation.

e) F test

Table 14. Results of the F Test of the Effect of X1 and X2 on Y

ANOVA [a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6193,938	2	3096,969	119,302	,000 [b]

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	Residual	3504,475	135	25,959		
	Total	9698,413	137			
a. Dependent Variable: Innovation Learning						
b. Predictors: (Constant), Teacher Pedagogical Competence, Digital Literacy						

Source : SPSS Processing Results , Researcher (2026)

Based on the results of the table above, it is known that the significance value of the influence of X1 and X2 on Y is 0.000 < 0.05 and the calculated F is 119.302 > 3.06. This proves that Ho3 is rejected and Ha3 is accepted. The conclusion is that there is a significant influence between digital literacy and teacher pedagogical competence on learning innovation.

DISCUSSION

The Influence of Digital Literacy on Learning Innovation at Sekayu District Vocational Schools

Testing the first hypothesis, it was found that digital literacy has a significant effect on learning innovation at SMK Sekayu District. This is indicated by a significance value of 0.000 <0.05 and a calculated t value of 14.603 > t table 1.656. Thus, Ho_1 is rejected and Ha_1 is accepted, which means that digital literacy has a significant effect on learning innovation. The results of the correlation between digital literacy and learning innovation also show a value of 0.781 which is in the category of a strong positive relationship. This means that the better the digital literacy of teachers, the higher the tendency of teachers to develop innovation in learning. This finding indicates that teachers' ability to access, manage, evaluate, and utilize digital technology is an important factor in encouraging more creative, interactive, and appropriate learning according to student needs.

In the context of vocational schools, digital literacy plays a highly strategic role because vocational learning requires not only theoretical mastery but also practical skills relevant to the evolving world of work. Teachers with strong digital literacy tend to be more adept at utilizing digital learning media, practical videos, simulations, online learning platforms, interactive assessment applications, and internet-based learning resources. With these skills, learning is no longer limited to lectures but can be developed into more active, contextual, and experiential learning.

These findings align with research by Pratiwi, Elisa, Ariyani, and Harahap (2024), which explains that digital literacy is not just the ability to use technology but also encompasses critical thinking skills, the responsible use of digital information, and the support of creativity and

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collaboration in learning. Therefore, digital literacy can serve as a foundation for teachers in designing more innovative learning. Furthermore, research by Widhanarto, Prihatin, and Kusumawardani (2024) shows that teachers' digital competence has a positive relationship with social media-based learning strategies and learning quality. This research confirms that current learning requires technology integration to make the learning process more active, creative, effective, and enjoyable. This aligns with the findings of this study, as teachers with high digital literacy tend to be better able to use social media, learning videos, online discussion forums, and digital-based assessments to improve learning quality and encourage innovation in the classroom.

In the context of modern education, the OECD (2023) emphasized that strengthening teachers' digital competencies needs to be done through three main approaches: establishing digital competency standards, continuing professional development, and providing a supporting ecosystem for digital education. This opinion is relevant to research findings because learning innovation is determined not only by the availability of technology but also by teachers' readiness to use technology pedagogically. This means that teachers with good digital literacy will be better able to adapt learning methods, media, and evaluation to technological developments and student needs. This supports the creation of an interactive, innovative, and student-centered learning environment. Therefore, the results of this study reinforce the view that digital literacy is a crucial factor in driving learning innovation. Teachers with good digital literacy are not only able to use technological devices but also able to integrate them into learning strategies, media, and evaluation.

Based on statistical test results and previous research, it can be concluded that digital literacy significantly influences learning innovation at vocational schools in Sekayu District. The higher a teacher's digital literacy, the greater their opportunity to create creative, adaptive, and relevant learning experiences, in line with developments in educational technology.

The Influence of Teachers' Pedagogical Competence on Learning Innovation at Vocational High Schools in Sekayu District

The second hypothesis test shows that teacher pedagogical competence has a significant effect on learning innovation. This is proven by a significance value of 0.000 <0.05 and a calculated t value of 14.650 > t table 1.656. Thus, Ho_2 is rejected and Ha_2 is accepted, so it can be stated that teacher pedagogical competence has a significant effect on learning innovation in Sekayu District Vocational High Schools. The correlation value between teacher pedagogical competence and learning innovation of 0.782 indicates a strong positive relationship. This means that the better

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the teacher's pedagogical competence, the higher the teacher's ability to carry out learning innovation. Pedagogical competence is the main basis for teachers in understanding student characteristics, preparing learning plans, choosing appropriate methods, implementing the learning process, and conducting targeted evaluations.

In the context of vocational high school learning, pedagogical competence plays a crucial role because vocational high school students require learning that is applicable, contextual, and aligned with the demands of the workplace. Teachers with strong pedagogical competence will be better able to adapt learning strategies to student needs, the characteristics of productive and adaptive subjects, and technological and industrial developments. Therefore, pedagogical competence is not only related to teaching ability but also relates to teachers' ability to design innovative and meaningful learning. This finding aligns with research by Rahayu and Muhtar (2022), which emphasized that 21st-century teachers need to possess creative and innovative thinking skills, understand student development, establish effective communication, and be open to technological advances. Strong pedagogical competence makes teachers not only transmitters of material but also facilitators, dynamists, and catalysts that help students develop creatively.

Thus, teacher pedagogical competence can be understood as a fundamental skill that determines the quality of learning innovation. Digital literacy is indeed important, but without adequate pedagogical competence, technology will only be a technical tool. Conversely, when teachers possess strong pedagogical competence, technology, methods, media, and evaluation can be more appropriately designed to improve the quality of learning. Based on the analysis and support from previous research, it can be concluded that teacher pedagogical competence significantly influences learning innovation at vocational high schools in Sekayu District. The better a teacher's pedagogical competence, the greater their ability to design, implement, and evaluate innovative learning.

The Joint Influence of Digital Literacy and Teacher Pedagogical Competence on Learning Innovation at Vocational High Schools in Sekayu District

The results of the third hypothesis test indicate that digital literacy and teacher pedagogical competence simultaneously have a significant effect on learning innovation. This is indicated by a significance value of 0.000 <0.05 and a calculated F value of 119.302 > F table 3.06. Thus, Ho_3 is rejected and Ha_3 is accepted, which means that digital literacy and teacher pedagogical competence simultaneously have a significant effect on learning innovation at SMK Sekayu District. This finding indicates that learning innovation is not only determined by a single

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factor. Digital literacy provides teachers with the ability to access, select, and utilize digital technology in learning. Meanwhile, pedagogical competence helps teachers determine how the technology is used appropriately according to learning objectives, student characteristics, subject matter, and the form of evaluation used.

In other words, digital literacy serves as a reinforcement of technological mastery, while pedagogical competence serves as a guide to ensure that the use of technology remains in line with the principles of effective learning. If these two variables work together, teachers will be better able to create learning that is creative, technology-based, student-centered, and relevant to the needs of vocational education. In vocational high school learning, the integration of digital literacy and pedagogical competence is crucial. Vocational high school teachers are required to be able to connect learning materials with the needs of the world of work, industrial developments, and 21st-century skills. Therefore, learning innovation in vocational high schools can be realized through the use of digital media, project-based learning, work simulations, application-based evaluations, online collaboration, and the utilization of digital learning resources relevant to students' areas of expertise.

This finding is in line with research by Nafasabilla and Yohamintin (2025) which states that teachers' digital-pedagogical competence is not only related to the ability to use technology, but also the ability to integrate technology into learning planning and implementation to create creative and innovative learning.

In line with the findings of this study, digital literacy and teacher pedagogical competence are simultaneously crucial factors in driving learning innovation. Furthermore, Bentri et al. (2022) explain that digital pedagogical competence is essential for teachers facing the Industrial Revolution 4.0 era. Teachers are not only required to be proficient in using digital devices but also to master a variety of learning strategies to make learning more creative and relevant to current developments. This opinion is relevant to the context of vocational schools (SMK) because vocational learning is closely linked to technological changes, the world of work, and the need for practical skills. Therefore, the integration of digital literacy and pedagogical competence is an important foundation for producing applicable and contextual learning innovations.

Thus, the results of this study illustrate that learning innovation at SMK Sekayu District will be stronger if teachers not only master technology but also have good pedagogical skills. Both need to be developed in a balanced manner through training, academic supervision, teacher learning communities, and digital support in schools. It can be concluded that based on the results of the F test and the support of previous research, it can be concluded that digital literacy and

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teacher pedagogical competence together have a significant influence on learning innovation at SMK Sekayu District. Learning innovation will be more optimal if teachers are able to combine digital technology mastery with strong pedagogical skills in designing and implementing learning.

CONCLUSION

Based on the results of the study and discussion that have been described, the following conclusions can be drawn:

1. Teachers' digital literacy significantly influences learning innovation at vocational high schools in Sekayu District. The results show a strong relationship between digital literacy and learning innovation. Therefore, the hypothesis that digital literacy influences learning innovation is accepted. Therefore, the better teachers' skills in utilizing digital technology, accessing information, processing digital learning resources, and using technology-based media, the greater their opportunities to develop innovation in the learning process.
2. Teachers' pedagogical competence has a significant influence on learning innovation at vocational schools in Sekayu District. Research results show that competence teacher pedagogy has strong relationship with innovation Learning . Teachers' pedagogical competence has been shown to significantly influence learning innovation. Therefore, the hypothesis is accepted. These findings indicate that teachers' ability to understand student characteristics, design learning, implement the learning process, evaluate learning outcomes, and develop appropriate learning strategies significantly determines the emergence of innovative learning practices.
3. Teacher digital literacy and pedagogical competence jointly significantly influence learning innovation at vocational high schools in Sekayu District. Digital literacy and pedagogical competence simultaneously exert a significant influence on learning innovation. Therefore, learning innovation is not solely determined by digital technology mastery but also greatly influenced by teachers' pedagogical abilities in managing the learning process in a focused, creative, and responsive manner to student needs.

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