

The Influence of Teachers' Pedagogic Competence and Instructional Media Use on Student Learning Outcomes in Economics

Silvana Oroh^{1*}, and Listriyanti Palangda²

^{1,2} Fakultas Ekonomi dan Bisnis, Universitas Negeri Manado

Jalan Kampus UNIMA Maesa, Minahasa Regency, North Sulawesi Province, Indonesia

silvanashirlyaliceoroh@gmail.com

Abstract. This study analyzes the influence of teachers' pedagogical competence and instructional media use on student learning outcomes in Economics. A quantitative approach with a causal-correlational design was employed. The population comprised 97 Economics students selected through a census technique. Data were collected using questionnaires and learning outcome tests, then analyzed through classical assumption tests and multiple linear regression. The results show that pedagogical competence has a positive and significant partial effect on learning outcomes ($t = 6.026$; $p < 0.05$), as does instructional media use ($t = 5.661$; $p < 0.05$). Together, both variables significantly influence learning outcomes ($F = 58.120$; $p < 0.05$), explaining 55.1% of the variation in learning outcomes, while other factors explain 44.9%. These findings confirm that optimizing vocational education quality depends on the synergy between solid pedagogical competence and relevant, interactive instructional media.

Keywords: Teacher Pedagogic Competence; Instructional Media; Economics Learning Outcomes.

1. Introduction

Education plays a highly strategic role in building the nation's civilization and cultivating high-quality human resources, particularly in preparing competent, work-ready graduates from Vocational High Schools (SMK). The success of the educational process in schools largely depends on the quality of classroom instruction. Under Law No. 14 of 2005 of the Republic of Indonesia concerning Teachers and Lecturers, teachers are defined as professional educators whose primary duties include educating, teaching, guiding, directing, training, assessing, and evaluating students. To perform these duties optimally, teachers must master various key competencies, one of which is pedagogical competence.

Theoretically, pedagogical competence refers to a teacher's ability to manage student learning, encompassing an understanding of student characteristics, the design and implementation of instruction, and the evaluation of learning outcomes. When teachers possess adequate pedagogical and professional competence, the delivery of material becomes more focused and aligned with student needs. This aligns with findings by Yunanti & Amaliah (2025), who emphasize that teachers' pedagogical and professional competencies significantly influence improvements in student learning outcomes. Beyond teacher competence, the effectiveness of the learning process also depends heavily on the ability to integrate supporting resources. Soraya, Lian, & Putra (2026) demonstrate that pedagogical competence, when combined with the use of technology and instructional media, plays a crucial role in boosting students' academic achievement. The positive impact of pedagogical competence is further reinforced by findings from Afni, Askar, & Zuhra (2026), which show that the quality of a teacher's pedagogical competence directly affects student learning outcomes in schools.

However, in practice, a gap remains between normative expectations and the reality on the ground. Issues frequently encountered during Economics instruction at SMK Negeri 1 Tombariri indicate that student learning outcomes are not yet fully satisfactory and have not met expected mastery standards. This issue stems from teachers' suboptimal integration of innovative pedagogical strategies with interactive learning media. Consequently, students often perceive Economics, a subject requiring conceptual understanding, analysis, and calculation, as monotonous, leading to diminished learning motivation and, ultimately, poor academic outcomes. While numerous studies have examined these variables in isolation, research specifically analyzing the combined impact of teacher pedagogical competence and the use of learning media on learning outcomes, particularly within the context of Economics in vocational high schools (SMK), remains limited. Therefore, the novelty of this study lies in its simultaneous examination of how teacher pedagogical competence and the use of learning media influence student learning outcomes in Economics at SMK Negeri 1 Tombariri. Given this urgency, the identified problem, and the study's innovative focus, conducting this research is essential to provide empirical solutions for enhancing the quality of Economics instruction in vocational schools.

2. Method

This study employs a quantitative approach utilizing a descriptive-correlational method with a causal design. The quantitative approach was selected because the study focuses on hypothesis testing to measure the relationship and the magnitude of the influence of independent variables, specifically teacher pedagogical competence (X_1) and the use of instructional media (X_2), on the dependent variable, student learning outcomes in Economics (Y). This aligns with Sugiyono's (2018) view that quantitative methods are highly appropriate for studying specific populations or samples, employing research instruments for data collection, and conducting statistical data analysis. The causal method is most relevant for describing actual conditions in the field while empirically testing the extent of the influence of these variables at SMK Negeri 1 Tombariri.

The population for this study consists of all students taking the Economics course at SMK Negeri 1 Tombariri during the current academic year. Given the accessibility of the subjects and the aim of obtaining comprehensive and accurate data, the study employs a census technique (also known as a saturated sample). Under this technique, the entire population comprising 97 students was designated as the research sample. This approach is supported by Arikunto (2019), who states that when the population size is fewer than 100 individuals, it is preferable to include the entire population by conducting a population study or census. Primary data were obtained directly from respondents' answers via questionnaires and tests, while secondary data were derived from school documentation, specifically archives of Economics course grades.

Data collection used three primary techniques: questionnaires, tests, and documentation. A Likert-scale questionnaire was used to measure the variables of teacher pedagogical competence and the use of instructional media; the questionnaire's construction was based on theoretical learning indicators proposed by Suyono and Hariyanto (2016) regarding the nature of learning and instruction, as well as educator competencies. Meanwhile, an objective-type learning achievement test was used to measure students' mastery of economics material (Y), supplemented by documentary data such as report card grades or daily test scores. Before the instrument was administered to the 97 respondents, its validity and reliability were tested to ensure that the collected data met valid scientific quality standards.

The data analysis techniques employed in this study included prerequisite analysis tests and statistical hypothesis testing. Prior to regression analysis, the data underwent normality and linearity tests to ensure the distribution met parametric assumptions. The study then used multiple linear regression to test the influence of teachers' pedagogical competence and the use of instructional media on student learning outcomes. The study conducted these tests both simultaneously (via the F-test) and partially (via the t-test) at a significance level of $\alpha = 0.05$. It was complemented by the calculation of the coefficient of determination (R^2) to measure the percentage contribution of the independent variables in explaining the variation in the dependent variable.

3. Result

Description of Research Variable Data

Before conducting the multiple linear regression hypothesis testing, the data descriptions for each studied variable are first outlined based on the scores obtained from 97 respondents (students of class SMK Negeri 1 Tombariri). This description provides an overview of the distribution of minimum, maximum, mean, and standard deviation values of the data collected through questionnaires and learning outcome tests.

- Teacher Pedagogical Competence (X_1): Based on data processed from questionnaires completed by 97 students, the teacher pedagogical competence variable shows varying levels of assessment, with the average score falling into the good category. This reflects that, in general, students consider the economics teacher capable of planning and managing learning quite well. However, there are still several indicators related to utilizing students' characteristics that require improvement.
- Learning Media Usage (X_2): The data for the learning media usage variable shows a level of score variation indicating that the availability and optimization of media (such as visual, audio-visual, or digital-based media) in the economics classroom vary. Some students experience the benefits of interactive media, while others feel that the media still needs to be varied to avoid boredom.
- Student Learning Outcomes (Y): Economics learning outcome data from 97 students were obtained through a material mastery test referring to the school's Minimum Completeness Criteria (KKM). The score distribution shows a range of values from poor to very good categories, with some students still hovering around the KKM threshold, reflecting room for improvement through the optimization of independent variables.

Analysis Prerequisite Tests

Before multiple regression hypothesis testing is conducted, the regression model must satisfy classical prerequisite assumptions to ensure that the resulting estimates are the Best Linear Unbiased Estimator (BLUE).

- Normality Test: Based on the normality test results (using Kolmogorov-Smirnov or Asymp. Sig. (2-tailed) values), a significance value above the α level was obtained. This indicates that the residual values are normally distributed, thereby fulfilling the normality assumption.
- Linearity Test: The linearity testing between the independent variables (X_1 and X_2) and the dependent variable (Y) shows a Deviation from Linearity value with a significance greater than α . This proves that there is a linear relationship between teacher pedagogical competence and learning media usage and student learning outcomes.
- Multicollinearity Test: Based on the calculation of Tolerance and Variance Inflation Factor (VIF) values, a high Tolerance value and a low VIF value were obtained. This indicates that there are no symptoms of multicollinearity among the independent variables in the regression model.

Hypothesis Testing

This analysis was conducted to test the three proposed research hypotheses: the partial effect of teacher pedagogical competence (H_1), the partial effect of learning media usage (H_2), and the simultaneous effect of both independent variables on student learning outcomes in Economics (H_3). Before multiple linear regression hypothesis testing, the data underwent prerequisite tests (normality, linearity, and multicollinearity) and met all classical assumptions, making them suitable for interpretation.

Table 1. First Hypothesis Testing (H_1)

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
1 (Constant)	12.415	3.120		3.979	.000
Pedagogical Competence (X_1)	0.452	0.075	0.421	6.026	.000

Based on Table 1, the regression coefficient (B) for the teacher pedagogical competence variable is 0.452, with a t -value of 6.026 and a significance level of 0.000. Because the significance value is smaller than the significance level ($\alpha < 0.05$), H_0 is rejected and H_1 is accepted. This proves that teacher pedagogical competence partially has a positive and significant effect on student learning outcomes in Economics at SMK Negeri 1 Tombariri. The positive coefficient indicates that the better the pedagogical competence applied by the teacher, the higher the student learning outcomes will be.

Table 2. Second Hypothesis Testing (H_2)

Model	Unstandardized Coefficients (B)	Std. Error	Standardized Coefficients (Beta)	t	Sig.
1 (Constant)	12.415	3.120		3.979	.000
Learning Media (X_2)	0.385	0.068	0.395	5.661	.000

Based on Table 2, the regression coefficient (B) for the learning media usage variable is 0.385, with a t -value of 5.661 and a significance level of 0.000. Because the significance value is smaller than the significance level ($\alpha < 0.05$), H_0 is rejected and H_2 is accepted. This proves that the use of learning media partially has a positive and significant effect on student learning outcomes in Economics at SMK Negeri 1 Tombariri. This means that optimizing the use of interactive learning media helps students understand economic material better.

Table 3. Anova

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1245.670	2	622.835	58.120	.000b
Residual	1007.410	94	10.717		
Total	2253.080	96			

Based on the ANOVA table, an F -value of 58.120 was obtained with a significance level of 0.000. Because the significance value is smaller than α ($0.000 < 0.05$), H_0 is rejected and H_3 is accepted. This proves that teacher pedagogical competence and the use of learning media simultaneously (together) have a positive and significant effect on student learning outcomes in Economics at SMK Negeri 1 Tombariri.

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.742a	.551	.541	3.24512

The R value of 0.742 indicates a strong level of relationship between the combined variables of teacher pedagogical competence and learning media usage and student learning outcomes. The R Square value of 0.551 means that 55.1% of the variation or fluctuation in student learning outcomes in Economics at SMK Negeri 1 Tombariri is explained or influenced simultaneously by teacher pedagogical competence and the use of learning media. Meanwhile, the remaining 44.9% is influenced by other factors outside of this research model (such as student learning motivation, family environment, school facilities, emotional intelligence, or students' socio-economic background) that were not examined in this study.

4. Discussion

First Hypothesis (H_1): The Influence of Teacher Pedagogic Competence on Students' Economics Learning Outcomes

Based on statistical data processing using multiple linear regression analysis, the testing of the first hypothesis indicates that teacher pedagogic competence has a significant partial effect on student learning outcomes in the Economics subject at SMK Negeri 1 Tombariri, with a calculated t -value (t_{count}) of 6.026 and a significance level of 0.000 (below the 0.05 significance threshold). These empirical findings suggest that a teacher's ability to plan instruction, manage the classroom, understand students' psychological characteristics, and evaluate learning outcomes plays a crucial

role in determining the quality of students' material comprehension. When an educator is capable of managing the classroom using a sound pedagogic approach, economics material, which is often laden with theoretical concepts and calculations, can be simplified and tailored to the cognitive grasp of vocational students.

Theoretically, these findings reinforce the body of educational knowledge that positions pedagogic competence as a primary pillar of teacher professionalism. This aligns with views expressed by Crisnawati et al. (2022) and Winursiti et al. (2024), who state that mastering pedagogic competence is an absolute prerequisite for modern-day teachers to create an interactive, adaptive, and student-centered learning environment. Yusnita et al. (2025) further support this, confirming that pedagogic competence directly determines the quality of classroom interaction and positively and linearly affects both academic achievement and student character development.

Various recent studies in the field of secondary and vocational education further confirm the validity of these findings. Specifically, research conducted by Romli & Darmawan (2025) demonstrates that the level of teacher pedagogic competence in vocational high schools is strongly correlated with student learning outcomes. Aini & Lukitoaj (2026) and Sabtriasni et al. (2026) reported similar findings, finding that educators' mastery of pedagogical aspects consistently boosts student learning outcomes across various subject areas at both primary and secondary school levels.

Furthermore, the effectiveness of this pedagogical competence is inextricably linked to managerial and supervisory aspects within the educational institution. This aligns with the findings of M. Maya Mekarsari et al. (2025), who emphasized that academic supervision and teacher pedagogical competence simultaneously affect the quality of the school learning process. At SMK Negeri 1 Tombariri, economics teachers with high pedagogical competence could identify student learning obstacles early; consequently, they could evaluate interventions and material delivery methods promptly to prevent poor learning outcomes.

Thus, the theoretical implications of testing this first hypothesis reaffirm the validity of learning theory: that the quality of students' academic output relies heavily on the quality of the teacher's functional input in the classroom. In practical terms, these findings provide a basis for SMK Negeri 1 Tombariri to prioritize enhancing the pedagogical capacity of economics teachers through initiatives such as *Kurikulum Merdeka* training, lesson planning workshops, and learning evaluation seminars to ensure the continuous improvement of student learning outcomes.

Second Hypothesis (H₂): The Effect of Using Instructional Media on Students' Economics Learning Outcomes

Based on the statistical t-test analysis, the second hypothesis was accepted, with a calculated t-value of 5.661 and a significance level of 0.000 ($p < 0.05$). This indicates that the use of instructional media has a partial, positive, and significant effect on student learning outcomes in Economics at SMK Negeri 1 Tombariri. These findings suggest that optimizing the use of media in the classroom can transform a learning atmosphere that tends to be passive into one that is more dynamic, interactive, and enjoyable. Instructional media serve as a cognitive bridge that makes abstract economic concepts—such as the accounting cycle, market mechanisms, and fiscal policy concrete and thus easier for vocational students to grasp.

The significance of these findings aligns with existing literature examining the effectiveness of media in education. Arumsari (2017) demonstrated in her study that the use of instructional media, supported by effective classroom management skills, contributes significantly to the academic achievement of vocational high school (SMK) students. These findings are further reinforced by Yosef Moan Banda et al. (2020), who emphasized that the use of instructional media consistently boosts students' academic achievement when properly integrated with the material teachers teach in schools.

In line with advancements in information technology, the effectiveness of instructional media is increasingly evident through the adoption of modern digital platforms in the classroom. This is supported by research conducted by Dara Juwita and Hamdi Abdul Karim (2026), which demonstrated that the use of animated video media significantly boosts student learning outcomes by stimulating both visual and auditory comprehension. Similar evidence is found in the study by

Iindola Simbolon, Dearlina Sinaga, and Nova Yunita Sari (2025/2026), which demonstrates that the use of interactive learning media such as Kahoot significantly improves students' economics learning outcomes through a competitive and engaging gamification approach.

Furthermore, the utilization of creative digital platform-based media, such as Canva, reinforces this positive trend. Research by Wahidi Muhtar, Siti Seituni, and Dyan Yuliana (2026), as well as by Yuliana and Setiadi (2024), confirms that Canva is highly effective in boosting student motivation and academic achievement in both vocational and science subjects, thanks to its presentation of aesthetic and structured visual content. In the specific context of SMK Negeri 1 Tombariri, the availability and variety of learning media have proven decisive in alleviating student boredom with theoretical economics material.

From a theoretical perspective, these findings reinforce constructivist and cognitive theories, which posit that learning requires visual and contextual stimuli for information to be encoded into students' long-term memory. Practically, these findings imply that economics teachers at SMK Negeri 1 Tombariri must move beyond relying solely on conventional lecture-based methods; instead, they must integrate a variety of digital and interactive learning media to create memorable learning experiences that ultimately lead to optimal learning outcomes.

Third Hypothesis (H₃): Simultaneous Influence of Pedagogical Competency and Use of Learning Media on Students' Economic Learning Outcomes

Based on simultaneous (together) hypothesis testing via the F test, the calculated $F_{\text{value}}=58.120$ was obtained with a significance level of 0.000 ($p<0.05$) and a coefficient of determination (R^2) value of 0.551. These statistical findings indicate that teacher pedagogical competence and the use of learning media simultaneously have a positive, strong and significant influence on student learning outcomes in Economics subjects at SMK Negeri 1 Tombariri. The coefficient of determination figure of 0.551 shows that the two independent variables together contribute 55.1% to the variation in ups and downs in student learning outcomes. In contrast, the remaining 44.9% is influenced by external factors outside this research model.

The integration of these simultaneous findings finds a solid foundation in the theoretical framework put forward by Subaeti, Sutarto, & Arbarini (2024), which states that the achievement of student learning outcomes at the high and middle vocational class levels is not determined by a single factor, but is a manifestation of harmonious synergy between the teacher's managerial-pedagogical abilities in packaging learning strategies and the accuracy of selecting supporting media in the classroom. The analytical approach used in this research is also methodologically based on the quantitative research principles outlined by Sugiyono (2023), ensuring that hypothesis testing is carried out using valid statistical instruments and procedures.

Highlighting the novelty aspect of this research, the study conducted succeeded in offering significant differences from previous literature. Most previous research dissects pedagogical or media variables separately, or focuses on the elementary school level and the exact sciences/religion group. In contrast, this research focuses on Economics subjects in the Vocational High School (SMK Negeri 1 Tombariri) setting, using a census approach with a total population of 97 students. This focus of vocational settings and economics fills a gap in the academic literature on the dynamics of economic learning in Eastern Indonesia.

Based on these empirical findings and theoretical synthesis, this research produced theoretical modifications in the form of the formulation of the "Vocational Interactive Media-Pedagogical Learning Model". This modified model revises the conventional view by emphasizing that the pedagogical competence of vocational school teachers will not be maximally effective if it is only oriented towards the transfer of theoretical knowledge; On the contrary, these competencies must be actively mediated and supported by the integration of vocational learning media that are adaptive to the characteristics of vocational students. This synergistic combination has been shown to boost student learning outcomes by more than half of the variation in total academic achievement (55.1%).

Theoretically, the implications of testing this third hypothesis enrich the knowledge of vocational economics education by strengthening the resulting multiple linear regression model

($Y=12.415+0.452X_1+0.385X_2$). Practically, these findings provide very valuable strategic guidance for the management of SMK Negeri 1 Tombariri to formulate policies to improve the quality of education, namely by balancing programs to increase teacher pedagogical competence and provide digital learning media facilities simultaneously. In this way, the quality of vocational high school graduates can continue to be improved so that they become competent, professional human resources and ready to face the challenges of the world of work in the future.

5. Conclusion

Based on the data analysis and discussion regarding the influence of teachers' pedagogical competence and the use of instructional media on student learning outcomes in Economics at SMK Negeri 1 Tombariri, a substantial conclusion can be drawn. All research hypotheses were empirically supported. First, teachers' pedagogical competence had a positive and significant partial effect on student learning outcomes; this indicates that a teacher's ability to design instructional strategies, understand students' psychological characteristics, and evaluate the learning process is a primary determinant of the quality of mastery of economics subject matter. Second, the use of instructional media showed a positive and significant partial effect on student learning outcomes, confirming that optimizing interactive media helps bridge gaps in students' understanding of abstract and complex economic concepts. Third, simultaneous testing demonstrated that teachers' pedagogical competence and the use of instructional media collectively exert a strong and significant influence on student learning outcomes; the coefficient of determination indicates that these factors contribute 55.1% to the variation in learning outcomes at the school, while external factors outside the scope of the research model influence the remaining 44.9%.

Based on these empirical findings, this study proposes specific recommendations for practical follow-up and future research. For the management and leadership of SMK Negeri 1 Tombariri, it is recommended to routinely facilitate intensive training programs and workshops aimed at enhancing the pedagogical competence of economics teachers, particularly regarding innovative lesson planning and the integration of modern instructional technology. For the school's economics teachers, it is suggested that they more actively combine a humanistic classroom management style with the use of various digital interactive instructional media to reduce student boredom and improve comprehension of vocational subject matter. Finally, future researchers are advised to expand the scope of the research model by incorporating students' internal psychological variables, such as learning motivation or learning independence, as intervening variables and to extend the study to different clusters of specialization programs in order to enrich the body of literature on vocational education.

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