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Teaching Effectiveness as a Determinant of Teacher Innovation: A Structural Model Approach

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Abstract *- The demands of 21st-century learning and the characteristics of vocational education place teacher innovation as a key factor in improving the quality of learning. One important determinant of teacher innovation is teaching effectiveness, which reflects the teacher's ability to plan, implement, and evaluate learning systematically and adaptively. This study aims to analyze the influence of teaching effectiveness on teacher innovation in private vocational high schools (SMK) in Bekasi Regency. The study used a mixed methods approach with a sequential exploratory design. The qualitative phase was conducted through structured interviews with 30 teachers in five private vocational high schools to explore in-depth the practice of teaching effectiveness and its contribution to the emergence of learning innovation. The qualitative findings were used as the basis for developing a conceptual model and formulating research hypotheses. The quantitative phase involved 124 permanent foundation teachers selected through multistage random sampling and proportional random sampling techniques from a population of 180 teachers in nine accredited private vocational high schools. Quantitative data were collected using a closed-ended questionnaire and analyzed using Structural Equation Modeling–Partial Least Squares (SEM-PLS). The analysis results show that teaching effectiveness has a positive and significant effect on teacher innovation with a path coefficient value of 0.514, a T-statistic of 6.100, and a p-value of 0.001. This finding confirms that teachers with a high level of teaching effectiveness tend to be more innovative in developing learning strategies, methods, and media. This study provides theoretical contributions by strengthening the role of teaching effectiveness as a determinant of teacher innovation, as well as practical implications for teacher professional development and policies to improve the quality of learning in vocational schools.*

Keywords*: teaching effectiveness, teacher innovation, mixed methods, Vocational High Schools.*

I. INTRODUCTION

Teachers, as educators, are a crucial component in determining the quality of a nation's education. The quality of the graduates produced is undoubtedly influenced by the quality of the teaching staff. Because teachers play a crucial role in producing quality human resources, the government has implemented various methods to improve teacher quality. Article 6 of Law No. 14 of 2005 concerning Teachers and Lecturers states that the position of teachers and lecturers as professionals aims to implement the national education system and realize the goals of national education, namely the development of students' potential to become people who believe in and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens. Therefore, the presence of teaching staff is crucial in relation to their roles, duties, and responsibilities in implementing national education goals. It is clear that teachers, as educators, must continually improve their personal skills through various formal and informal training programs to become capable, competent, and creative individuals, capable of finding appropriate solutions in various situations they encounter, especially when interacting with students.

Many factors can contribute to achieving these educational goals. According to Calan and Qurniati, the educational process requires several factors to support its implementation, such as educators and education personnel, curriculum, funding, and educational facilities and infrastructure, which Law No. 20 of 2003

recognizes as the educational resource base. Improving the quality of education is a process integrated with the development of human resources. Teachers play a crucial role in achieving this quality. Practically, teachers contribute to the development of students' behavior, attitudes, knowledge, and skills, both individually and as a group.

Studies on innovation in education have not been extensively researched (Hardianto, F., et al., 2021). Most research on innovation has been conducted on individuals in companies that produce products. However, innovation in education, particularly among teachers in private vocational schools, remains minimal. Yet, if innovation were implemented as part of learning, not only teachers but also students would find it easier to carry out their duties and responsibilities to achieve goals.

Ideally, teachers would vary their teaching to suit students' needs. Furthermore, the ideal conditions for teacher innovation in the Industry 4.0 era include teachers who have the ability to assess students' learning load, who should not simply assign assignments, who should not forget to appreciate student achievement, and who should use a flexible curriculum (Wahyono, H., et al., 2020). However, generally speaking, teacher learning behavior still merely involves carrying out teaching duties and functions without being accompanied by the development of creative ideas, concepts, and behaviors. The challenge for teachers in the industrial revolution 4.0 is that a teacher must be able to change the way students think from utilizing to creating Industry 4.0 which is characterized by the presence of new technologies (Dasmo, 2022).

Teaching effectiveness is a concept that refers to the level of success of the learning process in achieving systematically established instructional objectives. This concept not only assesses whether learning takes place but also emphasizes the extent to which the process runs optimally, resulting in changes in students' competencies, attitudes, and skills. According to Ahmad & Suryana (2020), teaching effectiveness is achieved when teachers are able to formulate learning objectives clearly and purposefully, set realistic achievement indicators, and translate these objectives into learning designs that align with student characteristics. Effective teachers also choose appropriate methods, whether interactive lectures, discussions, demonstrations, or project-based learning, tailored to the type of material and class needs so that students can engage actively and meaningfully.

On the other hand, teaching effectiveness is also greatly influenced by the teacher's ability to build and facilitate collaboration between students. Hidayat, R., 2024 emphasized that well-designed group activities not only strengthen cooperation and communication but also foster conceptual understanding through peer interaction. Teachers need to ensure that each group member plays an active role and has the opportunity to express ideas, ask questions, and solve problems together.

Teaching effectiveness reflects a teacher's ability to comprehensively plan, implement, and evaluate the learning process. Effective teachers typically possess a deep understanding of student characteristics, adapt learning strategies to their needs and development, and possess effective classroom management skills. When teachers are able to identify various learning obstacles, they are encouraged to seek solutions through more creative and innovative approaches. A systematic evaluation process also helps teachers understand the weaknesses of previously used methods, thus opening up opportunities for improvisation and developing new learning models. Teachers with high teaching effectiveness tend to have the flexibility to adapt to curriculum changes, the dynamics of educational technology, and the demands of 21st-century learning. This condition creates a strong internal drive for teachers to innovate as a form of continuous improvement in their pedagogical practices. Thus, teaching effectiveness directly contributes to increased teacher innovation in the learning context.

II. METHOD

This study employed a mixed methods approach with a sequential exploratory design, integrating qualitative and quantitative research to analyze the influence of teaching effectiveness on teacher innovation. The qualitative phase was conducted at five private vocational high schools (SMK) in Bekasi Regency, involving 30 informants. The purpose of the structured interviews was to explore in-depth perceptions and practices of teaching effectiveness and their relationship to teacher innovation. The findings from the qualitative phase were used as the basis for developing a research model and formulating hypotheses.

The quantitative phase was conducted at nine accredited private vocational high schools (SMK) across five sub-districts in Bekasi Regency, with a population of 180 permanent foundation teachers. The sample was selected using multistage random sampling followed by proportional random sampling, resulting in 124 respondents. The Taro Yamane formula was used for calculation with a 5% margin of error. Data collection was

conducted through a closed-ended questionnaire, while data analysis used Structural Equation Modeling–Partial Least Squares (SEM-PLS) to empirically test the influence of teaching effectiveness on teacher innovation.

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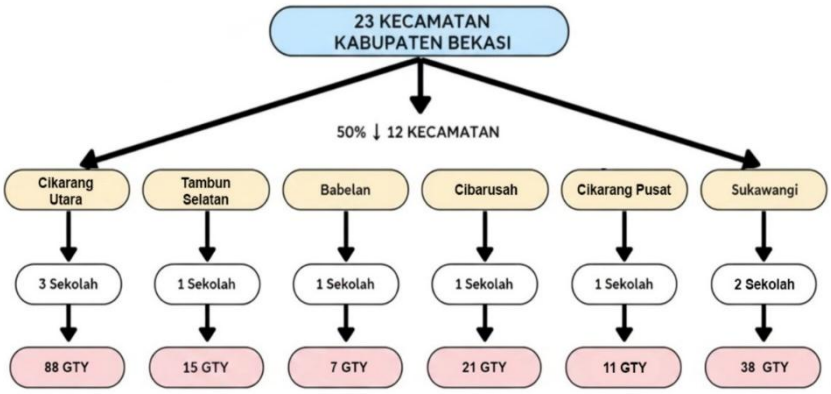

Figure 1: Multistage Random Sampling

III. RESULT AND DISCUSSION

A. Result

The research instrument trial was conducted on 30 private vocational high school teachers outside the selected sample group. The validity of the Teaching Effectiveness instrument was tested using the correlation coefficient between item scores and the total score through the Pearson Product Moment correlation technique. The instrument was declared valid if the calculated correlation coefficient (rhitung) was greater than (r tabel). Furthermore, the instrument reliability test was conducted on valid test items to measure the level of consistency or stability of the research instrument. The calculation of the reliability coefficient used the Cronbach's Alpha formula, with a minimum criterion of a reliability coefficient greater than 0.70 (> 0.70). Based on the reliability test on the Teaching Effectiveness instrument, the Cronbach's Alpha coefficient was obtained at 0.947. Based on the magnitude of the Cronbach Alpha coefficient, the research instrument for the Teaching Effectiveness variable is declared reliable. Based on the results of the validity test on the Teaching Effectiveness instrument using the Pearson Product Moment correlation technique, of the 40 statements tested, 30 valid statements were obtained. This means that there are 4 invalid statements, namely items number 7, 22, 32 and 37. The valid items are shown in table 1 below.

Table 1. Teaching Effectiveness Instrument Grid After Trial

No	Indicator	Question Items		Number of Items	Invalid Amount	After the Trial		Number of Items
		Positif	Negatif			Positif	Negatif	
1	Introduction to student character	1, 2, 3, 5, 6, 8	4,7	8	1	1, 2, 3, 5, 6, 7	4	7
2	Learning design	9, 10, 11, 13, 14, 15	12, 16	8	0	8, 9, 10, 12, 13, 14	11, 15	8
3	Implementation of learning	21, 22, 24, 26, 28, 29, 30	23, 25, 27	8	1	16, 17, 19, 20, 21, 22	18	7

No	Indicator	Question Items		Number of Items	Invalid Amount	After the Trial		Number of Items
		Positif	Negatif			Positif	Negatif	
4	Utilization of learning resources	31, 32, 33, 35, 36, 38, 40	34, 37, 39	8	2	23, 24, 25, 26, 27, 29	28	7
5	Evaluation of learning outcomes	41, 42, 43, 44, 45, 47, 50	46, 48, 49	8	0	30, 31, 32, 33, 36	34, 35	7
Amount		**35**	**5**	**40**	**4**	**29**	**7**	**36**

The data analysis phase began with descriptive statistical analysis, analysis prerequisite tests, and continued with variable analysis using the Structural Equation Modeling (SEM) method with the Partial Least Squares (PLS) approach in the SmartPLS application. The SEM-PLS analysis technique was chosen because this research began with a qualitative approach, which constructs research variables based on findings at the research locus. Therefore, the research model developed is based on the principles of constructivism, not positivism. This aligns with the partial least squares data analysis technique described by Hair et al. 2022.

The descriptive statistical data for the teaching effectiveness variable were calculated using SPSS 29. The descriptive statistical data are shown in Table 2 below.

Table 2. Data Description of Teaching Effectiveness Variables
Source: processing result of SPSS 29

No	Statistical Measures	Results
1	Lots of data	124
2	Mean	149.70
3	Median	152.00
4	Modus	160
5	Standard Deviation	15.429
6	Varians	238.077
7	Range	62
8	Minimum Score	118
9	Maximum Score	180
10	Sum	18564

Table 2 presents a statistical description of the Teaching Effectiveness variable based on various measures that illustrate the characteristics of the data distribution in this study. The total number of respondents was 124, which served as the basis for other statistical calculations. The average (mean) value of 149.70 indicates that teachers' Teaching Effectiveness is generally in the high category, considering that this score is close to the maximum possible value on the measurement scale. The median value of 152.00 indicates that half of the respondents scored Teaching Effectiveness above this number, and the other half below it. Meanwhile, the most frequently occurring value (mode) was 160, indicating that more teachers obtained this score than others. Data distribution was measured by the standard deviation of 15.429. This value indicates a fairly moderate variation in Teaching Effectiveness scores between teachers, meaning there are differences in competency levels, but not too extreme. The group mean of 238.077 is the square of the standard deviation, which provides a mathematical illustration of the diversity of the data.

The range value of 62 is obtained from the difference between the maximum score (180) and the minimum score (118). This range shows that although most teachers have high teaching effectiveness, there are also respondents with quite low scores. From the table above, it can also be explained that this table shows that the majority of respondents have quite high teaching effectiveness, with a relatively normal distribution and not too large data variations. The following is presented the frequency data for the teaching effectiveness variable shown in table 3.

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Table 3. Frequency Distribution of Teaching Effectiveness Variables
Source: processing result of SPSS 29

No	Interval Class	Frequency		Cum F
		Absolute	Relatively (%)	
1	118-128	15	12.10	15
2	129-138	12	9.68	27
3	139-148	24	19.35	51
4	149-158	36	29.03	87
5	159-168	24	19.35	111
6	169-178	11	8.87	122
7	179-188	2	1.61	124
Amount		**124**	**100**	

Table 3 presents the frequency distribution for the Teaching Effectiveness variable divided into seven interval classes. Each interval class reflects the number of respondents who have scores within a certain range, which are displayed in the absolute frequency, relative frequency (%), and cumulative frequency (F Cumulative Frequency) columns. The interval class with the largest number of respondents was 149-158, with 36 respondents (29.03%), indicating that the majority of individuals have a high level of Teaching Effectiveness within this range. The next classes with the highest frequencies were 139-148, and 159-168 with 24 respondents (19.35%), which also reflects the large number of respondents who have Teaching Effectiveness at the upper-intermediate level.

Meanwhile, the interval class with the fewest number of respondents was 179-188, which only had 2 respondents (1.61%), followed by 169-178 with 11 respondents (8.87%), then the interval class 129-138 with 12 respondents (9.68%) and followed by the interval class 118-128 with 15 respondents (12.10%) indicating that only a few individuals had lower Teaching Effectiveness. Cumulative frequency (F Kum) shows the number of respondents who had scores up to the upper limit of each interval. From 4 respondents in the first interval (118-128), this number increased gradually until it reached 124 in the last interval (179-188), which reflects the total number of samples in this study.

In general, this distribution shows that most respondents have teaching effectiveness in the medium to high category, with the peak of the distribution being in the interval 149-158. The data distribution is fairly even, with a tendency to concentrate in the middle value, indicating that the majority of individuals have good teaching effectiveness and are not too spread out at extreme low or high values.

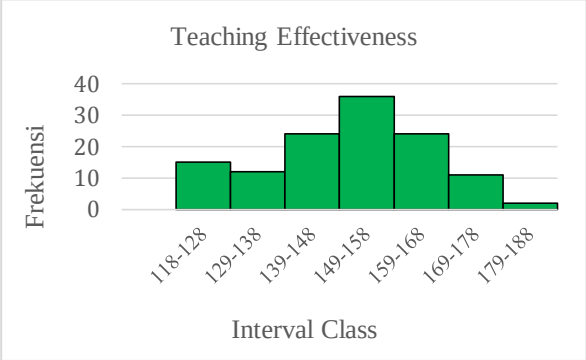

Figure 2: Histogram of Teaching Effectiveness Variables

Convergent validity testing was conducted by analyzing the loading factor values for each manifest indicator that measures both exogenous and endogenous variables, thus determining the correlation between the two. Figure 3 shows the Initial Outer Model of Teaching Effectiveness in Structural Equation Modeling (SEM) analysis based on Partial Least Squares (PLS). This model illustrates the relationship between the latent variable of Teaching Effectiveness and five main indicators, namely EM1, EM2, and EM3, EM4, EM5, each of which consists of several measurement items. In general, a good loading factor has a value above 0.70, indicating that the indicator has a strong relationship with the construct it measures. Chin, W., 1998's theory in the context of Partial Least Squares (PLS) states that the minimum acceptable outer loading (loading factor) value is 0.6.

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Loading factor values less than 0.6 are discarded or eliminated because they do not meet the criteria. In this model, most items have quite high loading factors, indicating that these indicators significantly represent the dimensions of Teaching Effectiveness. The following are the results of measuring the validity of teaching effectiveness using the innovation model.

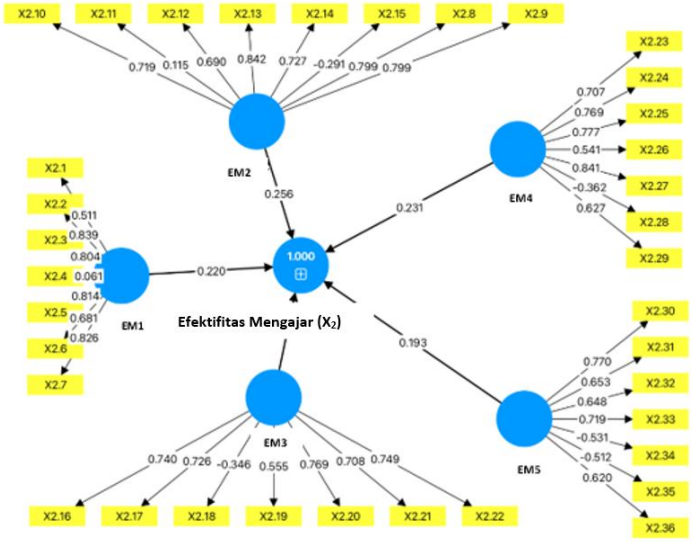

Figure 3. Initial Outer Model of Teaching Effectiveness Variables
Source: processing result of Smart PLS

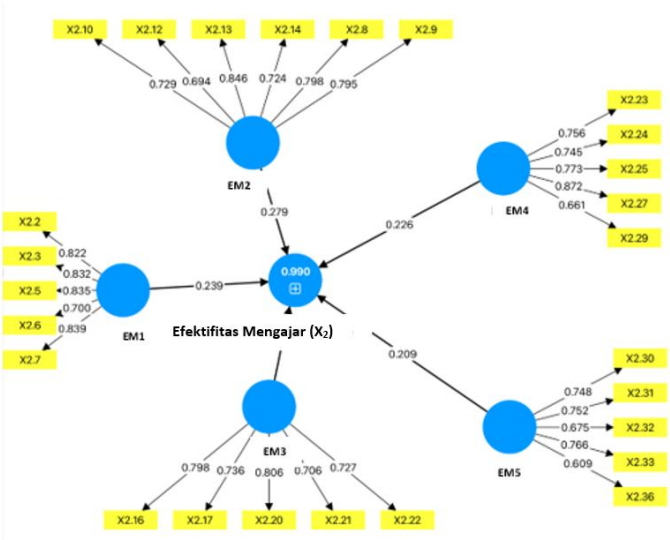

Figure 4 Outer Model Final Teaching Effectiveness
Source: processing result of Smart PLS

Table 4 presents the results of Composite Reliability and Average Variance Extracted (AVE) for the Teaching Effectiveness variable, which consists of five main indicators: EM1, EM2, EM3, EM4, and EM5. The three main measures in this table are Cronbach's Alpha, Composite Reliability, and AVE, which are used to assess the reliability and convergent validity of each indicator. The Cronbach's Alpha values for all five indicators are above 0.70, with the highest value in EM1 (0.866) and the lowest in EM5 (0.759). This indicates that all indicators have excellent internal consistency, as a Cronbach's Alpha value ≥ 0.70 is considered reliable in quantitative research. The higher this value, the greater the instrument's reliability in measuring latent variables.

Furthermore, Composite Reliability also showed excellent results, with all values above 0.80, indicating that the indicators measuring each dimension have a high level of reliability in measuring the latent variable of Teaching Effectiveness. The highest value was found in EM1 (0.903), while the lowest value was in EM5 (0.836). This indicates that these five indicators are quite stable and have high reliability in measuring Teaching Effectiveness.

Meanwhile, Average Variance Extracted (AVE) is used to assess convergent validity, namely how much the latent variable is able to explain the variance of the indicators that measure it. An AVE value ≥ 0.50 indicates that the construct has good convergent validity. In this table, all dimensions have AVE values above 0.50, with the highest value in EM1 (0.652) and the lowest value in EM5 (0.507). This means that most of the indicator variance is successfully explained by their respective constructs, so the model has quite strong convergent validity. Overall, the results in this table indicate that the Teaching Effectiveness variable has very high reliability, as well as good convergent validity, because all AVE values are above 0.50. Thus, the five indicators (EM1, EM2, EM3, EM4, and EM5) can be said to be able to represent the Teaching Effectiveness variable validly and reliably.

Table 4. *Composite Reliability* dan *Average Variance Extracted* (AVE) Teaching Effectiveness
Source: processing result of Smart PLS

Measurement Items	Cronbachs Alpha	Composite Reliability	AVE
EM1	0.866	0.903	0.652
EM2	0.858	0.895	0.587
EM3	0.811	0.869	0.571
EM4	0.819	0.875	0.584
EM5	0.759	0.836	0.507

B. Discussion

The results of the hypothesis test indicate that teaching effectiveness (X2) has a positive and significant effect on teacher innovation (Y) with a path coefficient of 0.514, a T-statistic of 6.100, and a p-value of 0.001. Because the T-statistic is >1.96 and the p-value is <0.05, this hypothesis is accepted. This indicates that the better a teacher's teaching effectiveness, the greater their ability to create innovative and creative learning.

Teaching effectiveness plays a key role in shaping teacher innovation, including private vocational high school teachers in Bekasi Regency who face the dynamic demands of vocational learning. According to Ahmad & Suryana (2020), teaching effectiveness is evident in teachers' ability to formulate clear learning objectives and design appropriate instructional designs. When teachers have a well-thought-out plan, they focus not only on delivering material but also on finding new, more relevant and creative ways to connect theory with practice in the classroom and workshops. In the context of vocational schools, this clarity of objectives often encourages teachers to innovate, such as modifying projects, varying simulations, or integrating digital devices to make learning more contextual.

This view is reinforced by Putra & Lestari (2020), who emphasized that learning success is greatly influenced by teachers' ability to manage their classes professionally. Effective classroom management creates an orderly and conducive learning environment, which automatically provides space for teachers to try new approaches without being burdened by disciplinary issues or classroom disruptions. In private vocational schools in Bekasi Regency, which have diverse student populations, the ability to maintain classroom order provides a foundation for teachers to conduct pedagogical experiments such as the use of industrial project-based methods or collaborative practices across expertise. In other words, the better the classroom management, the greater the opportunity for teachers to innovate.

Furthermore, Wijaya, R., 2021 emphasized that teaching effectiveness is also determined by a teacher's ability to provide meaningful and real-life learning experiences. In vocational schools, this relevance is crucial because students must prepare for the workforce. Teachers who are able to connect academic material to industrial situations will be encouraged to continuously update their methods, seek out the latest case studies, or create practical scenarios that mimic field conditions. This kind of innovation cannot emerge without strong teaching effectiveness, because only teachers who understand student needs and industry competency demands are capable of producing creative solutions in learning.

Hapsari, D., 2021 added that effective communication between teachers and students, the use of appropriate learning media, and consistent motivation contribute significantly to learning success. In a private

vocational school in Bekasi Regency, this combination indicates that effective teachers have a strong tendency to use a variety of the latest learning media and technologies, such as work practice videos, simulation applications, or collaboration platforms. The use of these media indicates that teaching effectiveness strengthens teachers' ability to innovate as they strive to find more engaging and efficient ways to deliver technical material.

According to Ramadhan, A., 2021, teaching effectiveness can be seen from students' success in achieving targeted competencies. Teacher awareness of learning outcomes, coupled with reflection, as recommended by Marlina, S., 2021, in the planning, implementation, and evaluation of learning, encourages vocational high school teachers to continuously improve their teaching methods. These improvements often generate new ideas, such as developing practical modules, improving work instructions, or adapting teaching aids, enabling teachers to be more innovative in managing the learning process.

Teachers' ability to facilitate in-depth understanding, as outlined by Pradana R., 2022, and the importance of instructional differentiation, as emphasized by Kurniasih, E., 2022, also contribute to innovation. Effective vocational high school teachers who understand that students have different learning rates will seek more creative approaches, such as creating tiered project assignments, providing alternative practice media, or forming work groups based on specific interests and expertise. Meanwhile, technology integration, as discussed by Nugroho et al., 2022, further strengthens teacher innovation because the demands of digitalization motivate vocational high school teachers to develop methods based on industrial simulations, digital design, or interactive presentations that have not previously been used.

Syafii, A., 2022 explains that fast, specific, and constructive feedback is a crucial component of effective teaching. It allows teachers to ensure students understand the material and identify areas for improvement. Feedback serves not only as an evaluation but also as a two-way communication tool that helps teachers track students' learning progress in real time. When teachers strive to provide timely feedback, they are encouraged to find more efficient methods, such as using digital assessment rubrics, assignment monitoring apps, online evaluation platforms, or quick reflection formats. This innovation is particularly relevant for private vocational high school teachers in Bekasi Regency who handle practical learning, as monitoring student work requires more accurate and concise evaluation tools. Thus, the demand for fast feedback indirectly increases teacher innovation by creating more modern and adaptive assessment systems tailored to the needs of vocational learning.

Ismail & Rahmawati (2022) highlight the importance of pedagogical closeness, namely a positive emotional connection and supportive communication between teachers and students. This warm relationship creates trust, comfort, and a sense of emotional security so that students feel free to ask questions, experiment, or try new things in the learning process. In the context of private vocational schools in Bekasi Regency, which have diverse student characteristics, pedagogical closeness encourages teachers to be more creative in choosing learning approaches, such as the use of mentoring techniques, reflective dialogue, personal demonstrations, and vocational coaching approaches. Teachers who are able to build pedagogical closeness tend to be more innovative because they understand students' backgrounds, learning styles, and psychosocial needs, resulting in more personalized and varied learning strategies.

Fitriyani, N., 2023 emphasized the importance of flexibility in teaching, namely the ability of teachers to adjust methods, the rhythm of material delivery, activities, and exercise formats based on class dynamics. This flexibility is essential in vocational high school learning, especially when teachers face classes with varying ability levels or when practical learning requires adjustments to tools and field conditions. Flexible teachers will usually try various forms of innovation, such as designing projects with gradual levels of difficulty, arranging individual and group activities tailored to student competencies, changing instructional strategies mid-course, or adjusting media when technical conditions change. Thus, flexibility is not only an indicator of teaching effectiveness but also a strong driver of innovation in responding to the daily challenges of vocational learning.

Halim & Prasetyo., 2023 stated that effective teachers must be able to foster students' intrinsic motivation, especially through challenging yet realistic activities. In vocational high school learning, intrinsic motivation often increases when students are given contextual projects relevant to the world of work, such as solving engineering cases, industrial simulations, or designing simple products according to their expertise. To foster this motivation, teachers need to find interesting and relevant strategies that automatically encourage them to develop innovative approaches, for example, project-based learning (PjBL), problem-based learning, or project-based industry collaboration. This shows that teaching effectiveness through increasing student motivation is directly proportional to the increase in innovativeness of vocational high school teachers.

Furthermore, Wahyudi et al., 2023, emphasized that interactive classes rich in questions and answers, discussions, collaboration, and reflection can increase students' cognitive engagement. To create interactive classes, teachers need to explore a variety of activity models, such as vocational debates, pair demonstrations,

peer teaching, and technical brainstorming. Meanwhile, Sari & Widodo, 2023, emphasized the importance of organizing material in a coherent and logical manner, allowing teachers to design a learning flow that is easy to understand and relevant to students' competencies. When vocational high school teachers strive to present interactive classes and well-organized materials, they are automatically encouraged to create a variety of innovative activities, such as modules patterned after industrial work steps, innovative practice worksheets, or visual media to facilitate the understanding of technical procedures.

According to Handayani (2023), time management is also a crucial aspect of teaching effectiveness. Proper time management allows teachers to allocate time proportionally for theory, practice, discussion, and evaluation. In vocational learning, time management often requires innovation in simplifying activity flow, changing practice formats, or using tools that can expedite the process. Meanwhile, continuous formative assessment, as explained by Andini, M. (2023), requires teachers to continuously monitor student development. In vocational schools, this assessment can take the form of competency checklists, micropractice evaluations, or digital portfolios. These instruments demonstrate that the demands of formative assessment encourage teachers to create or adapt innovative evaluation tools to produce more accurate learning information.

Finally, Yusrina & Maulana (2024) emphasized that comprehensive evaluation of the learning process and outcomes serves as the foundation for teachers to design subsequent learning improvements. This evaluation encourages teachers to develop new ways to improve teaching effectiveness, whether through media innovation, new instructional approaches, or the development of learning tools. Thus, it is clear that strong teaching effectiveness will strengthen the innovation of private vocational high school teachers in Bekasi Regency, as effective teachers are constantly adapting, improving, and creating new approaches to improve the quality of learning and its relevance to industry demands.

Summary: The empirical results (path = 0.514, T = 6.100, p = 0.001) support the claim that teaching effectiveness is a strong determinant of teacher innovation. The theoretical basis and empirical evidence recommend a continuous training approach, collaborative practice, and organizational support to transform pedagogical capabilities into innovations that impact learning quality. Therefore, professional development policies at the school and office levels need to be directed toward improving teaching effectiveness with a focus on instructional creativity and technology integration, thereby fostering a culture of innovation within the school environment.

IV. CONCLUSION

The results of the hypothesis testing indicate that teaching effectiveness has a positive and significant effect on teacher innovativeness, with a path coefficient of 0.514, a T-statistic of 6.100, and a p-value of 0.001. This finding confirms that the higher the teaching effectiveness of teachers, the greater their ability to develop innovative and creative learning, especially in the context of private vocational schools in Bekasi Regency which are faced with the demands of dynamic and contextual vocational learning. Theoretically and empirically, teaching effectiveness is reflected in clear learning planning, conducive classroom management, relevance of material to the world of work, use of media and learning technology, providing constructive feedback, and pedagogical flexibility and reflection. All of these aspects encourage teachers to continuously adapt, experiment, and create new learning approaches that are relevant to the needs of students and industry demands. Thus, teaching effectiveness can be seen as a key determinant in strengthening teacher innovativeness.

The implication is that efforts to increase teacher innovation need to be directed at strengthening teaching effectiveness through ongoing professional development programs, collaborative practices among teachers, and school organizational support. Policies at the school level and education offices should facilitate the development of instructional creativity and the integration of learning technology to foster a culture of sustainable innovation within vocational schools.

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