EduLine: Journal of Education and Learning Innovation *ISSN: 2775-6173 (online)*
Vol. 6 No. 2 (2026)
https://doi.org/10.35877/454RI.eduline5209

Video Tutorial-Based Instruction and Multidimensional Learning Engagement in Computer and Network Engineering Vocational Education

Lilis Suryani*, Asmah Amir, Syarifnur

Educational Technology, Universitas Muhammadiyah Bone, Bone, 92716, Indonesia

Abstract

This study examined the effect of video tutorial media on students' learning engagement in the Vocational Concentration subject of Grade XI Computer and Network Engineering (TKJ) students at SMK Negeri 4 Bone. A quantitative approach with a pre-experimental One Group Pretest-Posttest Design was employed. The sample consisted of 16 students selected through total sampling. Data were collected using questionnaires, observations, and documentation. The results showed that students' learning engagement increased after the implementation of video tutorial media. The average score improved from 71.31 (high category) to 91.12 (very high category). The Shapiro–Wilk test confirmed that the data were normally distributed, while the Paired Sample t-test revealed a significant difference between pre-test and post-test scores ($p < 0.05$). The findings indicate that video tutorial media has a positive and significant effect on students' learning engagement, particularly in behavioral, emotional, and cognitive dimensions. In conclusion, video tutorial media is an effective learning tool for enhancing students' engagement in vocational education and can support more active and meaningful learning experiences.

Keywords: Video Tutorial Media, Learning Engagement, Vocational Concentration Subject, Computer and Network Engineering (TKJ)

1. Introduction

Digital transformation has driven significant changes in various aspects of life, including the education sector. The development of information and communication technology has not only expanded access to learning resources but has also transformed the way students acquire, manage, and construct knowledge. In the context of 21st-century education, the utilization of digital technology has become one of the essential strategies for creating learning that is more flexible, interactive, and student-centered. Mayer (2009) explains that the integration of visual and verbal elements through digital media can help students process information more effectively than verbal instruction alone. In line with this, the policy of the Ministry of Education, Culture, Research, and Technology also encourages the utilization of digital technology as an effort to improve the quality of the learning process and students' competencies at various educational levels.

The utilization of educational technology has become increasingly important in vocational education because its learning characteristics are oriented toward the mastery of occupational competencies and practical skills. Vocational High Schools (SMK) are required to produce graduates who not only understand concepts but are also capable of applying knowledge and skills in accordance with workplace demands. Therefore, the learning process in vocational schools requires strategies and instructional media that are capable of connecting conceptual aspects with practical applications in a concrete manner. The increasing internet access among secondary school students, as reported by Statistics Indonesia (2024), indicates that the current learning environment increasingly supports the use of technology-based instructional media as part of the learning process in schools.

One form of digital instructional media widely used in vocational education is video tutorial media. This medium has characteristics that enable the presentation of learning materials visually, systematically, and sequentially, making it suitable for explaining both concepts and complex work procedures. From the perspective of the Cognitive Theory of Multimedia Learning, students learn more effectively when information is presented through a combination of images,

* Corresponding author.
E-mail address: lilissuryani88bone@gmail.com(Lilis Suryani)

text, and audio that complement one another (Mayer, 2009). These characteristics make video tutorial media relevant for subjects requiring mastery of work procedures and technical skills, including the Computer and Network Engineering (TKJ) specialization program.

Various studies have demonstrated the positive contribution of video tutorials to the learning process. Putri et al. (2024) reported that the use of video tutorials was able to increase students' interest and active participation during learning. Similar findings were reported by Nabar et al. (2023) who showed that video tutorials effectively improved students' understanding of practical materials because they were able to present work procedures in a concrete and systematic manner. In addition, Aulia et al. (2023) found that instructional video media helped students understand technical materials while simultaneously improving their concentration during learning activities. These findings indicate that video tutorials have the potential to support learning effectiveness through the presentation of information that is more engaging and easier to understand.

Nevertheless, most previous studies have focused on learning outcomes, conceptual understanding, practical skills, motivation, or learning interest as indicators of learning success. Studies that specifically position learning engagement as the primary variable remain relatively limited, particularly in the context of vocational education. In fact, successful learning is determined not only by learning outcomes but also by the extent to which students actively engage in the learning process. Learning engagement is an important indicator because it reflects the quality of students' interaction with ongoing learning activities.

The concept of learning engagement refers to students' involvement encompassing behavioral engagement, emotional engagement, and cognitive engagement (Fredricks & Paris, 2016). Behavioral engagement is reflected in students' active participation in learning activities, emotional engagement relates to students' interest, enthusiasm, and affective responses toward learning, while cognitive engagement indicates students' commitment to understanding learning materials and employing deep thinking strategies. These three dimensions complement one another and contribute to the development of meaningful learning experiences. Therefore, improving learning engagement has implications not only for students' active participation but also for the overall quality of the learning process.

In vocational education, learning engagement plays an increasingly important role because students are required not only to understand theoretical concepts but also to master work procedures and technical skills progressively. The Vocational Concentration subject in the Computer and Network Engineering program is one of the subjects that requires students' active engagement throughout the learning process. Mastery of the subject matter cannot be achieved solely through verbal explanations but also requires opportunities to observe, understand, and repeatedly review the work procedures being learned. Therefore, instructional media capable of supporting these needs through clear, systematic, and easily accessible presentations of learning materials are required.

The results of the preliminary observation conducted at SMK Negeri 4 Bone showed that the Vocational Concentration learning process was carried out through a combination of lectures, direct explanations, and teacher demonstrations. During its implementation, students demonstrated varying levels of engagement in practical activities, discussions, and the completion of learning tasks. This condition indicates that learning engagement remains an important aspect requiring attention in efforts to improve the quality of learning. For procedural and technical materials, students require instructional media that enable them to independently review work procedures according to their individual learning needs.

Video tutorial media possess characteristics that have the potential to address these needs. Through structured visual presentations, students can revisit learning materials, repeat specific procedures, and adjust their learning pace according to their level of understanding. From a constructivist perspective, opportunities to explore and construct understanding independently can encourage students' engagement in the learning process. Therefore, the use of video tutorials functions not only as a medium for delivering information but also as a means of strengthening students' behavioral, emotional, and cognitive engagement during learning.

Based on the literature review and these empirical conditions, there are two research gaps underlying this study. First, studies on video tutorials in vocational education are still predominantly focused on learning outcomes, skills, motivation, and learning interest, while studies examining learning engagement as a multidimensional construct remain

limited. Second, studies investigating the relationship between the use of video tutorials and learning engagement in the context of the Computer and Network Engineering Vocational Concentration subject at vocational high schools are still scarce. Therefore, this study offers a contribution by examining the effect of using video tutorial media on learning engagement encompassing the behavioral, emotional, and cognitive dimensions among vocational high school students.

The novelty of this study lies in the use of learning engagement as the primary variable to evaluate the effectiveness of video tutorial media in vocational learning, rather than focusing solely on learning outcomes or practical skills. Furthermore, this study was conducted within the context of the Computer and Network Engineering Vocational Concentration subject, which possesses procedural and technical characteristics, thereby providing an empirical perspective that differs from previous studies.

2. Literature Review

2.1 Video Tutorial Media in Learning

Instructional media are means used to deliver learning messages so that they can help students understand learning materials more effectively. The existence of instructional media functions not only as a tool for delivering information but also as a facilitator that supports the occurrence of active and meaningful learning processes. From the perspective of modern learning theory, instructional media are not merely understood as tools for delivering learning materials but also as means that facilitate students' learning activities. In constructivist theory, learning is viewed as an active process in which students construct their knowledge through interaction with experiences and the learning environment. Jean Piaget emphasized that the learning process occurs through the mechanisms of assimilation and accommodation, namely when students relate new information to their existing cognitive structures and adjust them to form new understanding. Meanwhile, Lev Vygotsky emphasized the importance of social interaction and support from the learning environment in facilitating the development of students' cognitive abilities (Amir et al., 2024).

One form of instructional media that is widely used in technology-based learning is video tutorial media. Video tutorial media are audiovisual media that present information through a combination of moving images, sound, text, and demonstrations of specific procedures in a systematic manner, thereby facilitating students' understanding of learning materials Cantika (2022), Khosiyono et al. (2022). These characteristics make video tutorial media relevant for learning activities that require mastery of procedures and practical skills because they are capable of presenting work procedures concretely and sequentially.

According to Sumantri, (2019) video tutorial media possess characteristics that enable students to regulate their own learning pace through pause, replay, and repetition features according to their learning needs. Such flexibility provides students with opportunities to study learning materials more thoroughly, thereby improving their understanding and learning independence. In addition, video tutorial media are capable of presenting abstract concepts in a more concrete manner through a combination of complementary visual and audio elem ents.

The effectiveness of video tutorial media is also influenced by the quality of its presentation. Several important aspects that need to be considered include the clarity of material presentation, the systematic sequence of tutorial steps, ease of use, attractiveness of the display, visual and audio quality, and the suitability of the materials with the learning objectives (Nugraha & Iskandar, 2024). When these aspects are fulfilled, video tutorial media function not only as learning resources but are also capable of increasing students' attention, interest, and engagement throughout the learning process.

2.2 Learning Engagement

Learning engagement is a concept that describes the level of students' involvement in the learning process. Such engagement is not only reflected through students' attendance or physical activities in the classroom but also encompasses the emotional and cognitive aspects that emerge throughout the learning process (*Fredricks & Paris 2016*). In the context of modern education, learning engagement is regarded as one of the important indicators determining the quality of learning experiences and learning success (Zubair & Muneer, 2021)

Fredricks & Paris (2016) explained that learning engagement consists of three main dimensions, namely behavioral engagement, emotional engagement, and cognitive engagement. Behavioral engagement relates to students' active participation in learning activities, including attendance, involvement in academic activities, and compliance with classroom rules. Emotional engagement refers to students' affective responses toward learning, which are reflected through interest, enthusiasm, enjoyment, and attachment to the learning environment. Meanwhile, cognitive engagement indicates the level of students' mental effort in understanding learning materials, solving problems, and applying deep learning strategies.

These three dimensions are interconnected in forming comprehensive learning engagement. Students with high levels of learning engagement tend to demonstrate active participation, possess positive feelings toward learning, and strive to understand learning materials more deeply than students with lower levels of engagement (Heilporn & Lakhal, 2021). Therefore, enhancing learning engagement has become one of the primary objectives of the learning process because it is closely related to the quality of students' learning experiences.

The level of learning engagement is influenced by various factors originating from both the learning environment and students' individual characteristics. External factors include instructional quality, teacher support, learning strategies, the use of instructional media, and classroom interaction. Meanwhile, internal factors include learning motivation, self-efficacy, academic ability, emotional intelligence, and peer relationships (Shao & Kang, 2022). Among these factors, the use of instructional media that correspond to the characteristics of the learning materials and students' needs is one of the factors with the potential to enhance learning engagement.

2.3 Relevant Studies

Previous studies have demonstrated that video tutorial media contribute positively to improving the quality of learning. However, the focus of these studies has varied, and only a limited number have positioned learning engagement as the primary variable.

The study conducted by Irmansyah et al. (2025) examined the effect of video tutorial-based instructional media on students' learning interest in the MYOB Computer Accounting subject at SMK Muhammadiyah 2 Pekanbaru. Using a quantitative approach with a Posttest-Only Control Group Design, the study found that the use of video tutorials had a significant effect on students' learning interest. Nevertheless, the study focused only on the affective aspect of learning interest and did not examine learning engagement as a multidimensional construct.

Amara & Purmadi (2025) investigated the effectiveness of video tutorial media in improving the practical skills of Educational Technology students in the Learning Web Design Practice course. Their findings showed that video tutorial media effectively helped students understand work procedures systematically and improved their practical skills. However, the study emphasized skill achievement rather than students' engagement throughout the learning process.

Meanwhile, Putri et al. (2024) found that the use of video tutorial media improved the learning outcomes of Grade X students at SMKN 1 Dua Koto. These findings indicate that video tutorial media can create more engaging learning experiences and support students' understanding of learning materials. However, the study focused on learning outcomes as the primary learning output and did not measure students' engagement during the learning process.

Based on previous studies, it can be concluded that video tutorial media have been proven to have positive effects on learning interest, skills, and learning outcomes. However, studies specifically examining the effect of video tutorial media on learning engagement encompassing behavioral engagement, emotional engagement, and cognitive engagement remain limited, particularly in the context of the Computer and Network Engineering (TKJ) Vocational Concentration subject at vocational high schools. Therefore, this study was conducted to fill this research gap by examining the effect of using video tutorial media on students' multidimensional learning engagement within the context of vocational education.

3. Research Method

This study employed a quantitative approach using a pre-experimental design, namely the One-Group Pretest–Posttest Design. This design was selected to measure changes in students' learning engagement before and after the implementation of video tutorial media. In this design, an initial measurement (pre-test) was administered before the treatment, followed by the implementation of the treatment, and concluded with a final measurement (post -test). The difference between the pre-test and post-test scores was used to determine the effect of using video tutorial media on students' learning engagement.

This study was conducted at SMK Negeri 4 Bone, located in Corawali Village, Barebbo District, Bone Regency, South Sulawesi. Data collection was carried out during the second semester of the 2025/2026 academic year, from December 2025 to June 2026.

The population consisted of all Grade XI Computer and Network Engineering (TKJ) students at SMK Negeri 4 Bone, totaling 16 students. Considering that the population size was relatively small, this study employed the total sampling technique, in which all members of the population were included as research participants. Therefore, the total sample comprised 16 students.

This study involved two variables, namely the use of video tutorial media as the independent variable and learning engagement as the dependent variable. Video tutorial media were implemented as the instructional treatment in the Vocational Concentration subject. Meanwhile, learning engagement was measured based on the three primary dimensions proposed by Fredricks and Paris (2016), namely behavioral engagement, emotional engagement, and cognitive engagement.

The research instrument consisted of a learning engagement questionnaire developed based on these three dimensions. The instrument comprised 25 statement items using a four-point Likert scale: Strongly Agree (4), Agree (3), Disagree (2), and Strongly Disagree (1). The indicators represented students' behavioral, emotional, and cognitive engagement throughout the learning process.

Before being used in the study, the instrument was tested for validity and reliability. The validity test was conducted using the Corrected Item–Total Correlation analysis. The results showed that all questionnaire items had correlation coefficients higher than the r-table value (0.361), indicating that all items were valid. Subsequently, the reliability test was conducted using Cronbach's Alpha coefficient, which yielded a value of 0.968. This value indicates that the instrument possessed a very high level of reliability and was therefore appropriate for data collection.

The research procedure was carried out in three stages. The first stage was preparation, which included instrument development, instrument validation, preparation of learning materials, development of the video tutorial media, and coordination with the school. The second stage was the implementation of the study, beginning with the administration of the pre-test to measure students' initial learning engagement. Subsequently, the learning process was conducted using video tutorial media as the treatment. After the completion of all learning activities, the students were administered the post-test to measure changes in learning engagement. The third stage involved data processing, data analysis, and drawing conclusions based on the research findings.

Data were analyzed using SPSS version 25. Descriptive analysis was employed to describe students' learning engagement before and after the treatment based on the minimum score, maximum score, mean, median, and standard deviation. Before hypothesis testing, the data were tested for normality using the Shapiro–Wilk test because the sample size was fewer than 50 respondents. After the data met the normality assumption, hypothesis testing was conducted using the Paired Sample t-test at a significance level of 0.05 to determine whether there was a significant difference between the pre-test and post-test scores. The decision criteria were based on the significance value, in which H_0 was rejected when $p < 0.05$, and consequently H_1 was accepted when $p < 0.05$.

4. Results and Discussion

4.1 Instrument Testing Results

The research instrument in the form of a learning engagement questionnaire was tested for validity and reliability before being used for data collection.

a. Validity Test

The validity test was conducted to determine the validity of the questionnaire. A questionnaire is considered valid if the statements are capable of measuring the construct intended to be measured (Sugiyono, 2021). The decision criteria for the validity test were as follows: if the calculated r-value was greater than the Product Moment r-table value, the questionnaire item was declared valid. Conversely, if the calculated r-value was lower than the Product Moment r-table value, the questionnaire item was declared invalid.

Table 1. Validity Test Results

Statement	R-value	R-table	Description
P1	0.810	0.361	VALID
P2	0.539	0.361	VALID
P3	0.832	0.361	VALID
P4	0.415	0.361	VALID
P5	0.704	0.361	VALID
P6	0.744	0.361	VALID
P7	0.906	0.361	VALID
P8	0.763	0.361	VALID
P9	0.744	0.361	VALID
P10	0.797	0.361	VALID
P11	0.772	0.361	VALID
P12	0.647	0.361	VALID
P13	0.393	0.361	VALID
P14	0.770	0.361	VALID
P15	0.905	0.361	VALID
P16	0.833	0.361	VALID
P17	0.777	0.361	VALID
P18	0.832	0.361	VALID
P19	0.860	0.361	VALID
P20	0.832	0.361	VALID
P21	0.745	0.361	VALID
P22	0.789	0.361	VALID
P23	0.863	0.361	VALID

P24	0.675	0.361	VALID
P25	0.766	0.361	VALID

(Source: IBM SPSS *Statistic Version 25*. 2026)

The validity test results indicate that all statement items met the validity criteria because they had correlation coefficients greater than the r-table value (0.361). Therefore, all items were considered valid and appropriate for measuring students' learning engagement.

b. Reliability Test

The reliability test was conducted to determine the consistency of the questionnaire as an instrument for measuring the research variables. A questionnaire is considered reliable if the responses to its statements remain consistent or stable over time. The criterion used was that if Cronbach's Alpha coefficient was greater than 0.70, the instrument was considered reliable. Conversely, if Cronbach's Alpha coefficient was less than 0.70, the instrument was considered unreliable.

Table 2. Reliability Test Results

Cronbach's Alpha	N of Items
.968	25

(Source: IBM SPSS *Statistic Version 25*. 2026)

Based on Table 2, the Cronbach's Alpha value was 0.968, which is greater than 0.70. Therefore, the research instrument was declared reliable. Since the instrument was both valid and reliable, it was suitable for subsequent data analysis.

4.2 Descriptive Statistical Analysis

Descriptive statistical analysis was conducted to provide an overview of students' learning engagement before and after the implementation of video tutorial media in the Vocational Concentration subject .

a. Descriptive Analysis of Pre-test Data

Descriptive analysis of the pre-test data was conducted to obtain an overview of students' initial learning engagement, including the number of samples, minimum score, maximum score, mean, standard deviation, and median. The results of the descriptive statistical analysis of the pre-test data are presented in Table 3.

Table 3. Descriptive Statistics of the Pre-test Data

Descriptive Statistics	Statistical Value
Number of Samples	16
Minimum Score	49
Maximum Score	100
Mean	71,31
Standard Deviation	13,195
Median	71,00

(Source: IBM SPSS *Statistic Version 25*. 2026)

Based on Table 3, the pre-test involved a total of 16 students. The minimum score was 49, while the maximum score was 100. The mean score was 71.31, the standard deviation was 13.195, and the median was 71.00. These results indicate that students' learning engagement before the implementation of the treatment had not yet reached an optimal level, and the degree of student engagement during learning remained relatively diverse. The frequency and percentage distribution of the pre-test data are presented in Table 4.

Table 4. Frequency and Percentage Distribution of the Pre-test Results

No	Score	Percenta ge (%)	Frequency	Categori
1.	81 - 100	25%	4	Very High
2.	61 - 80	62,5%	10	High
3.	41 - 60	12,5%	2	Low
4.	21 - 40	0	0	Very Low
Total		100	16	

(Source: IBM SPSS *Statistic Version 25*. 2026)

Based on Table 4, four students (25%) were classified in the very high category. Furthermore, ten students (62.5%) were classified in the high category, while two students (12.5%) were classified in the low category. No students were categorized as very low. To provide a clearer overview of the frequency distribution of the pre-test results, the data in Table 4 are presented in the form of a frequency distribution chart, as shown in Figure 1.

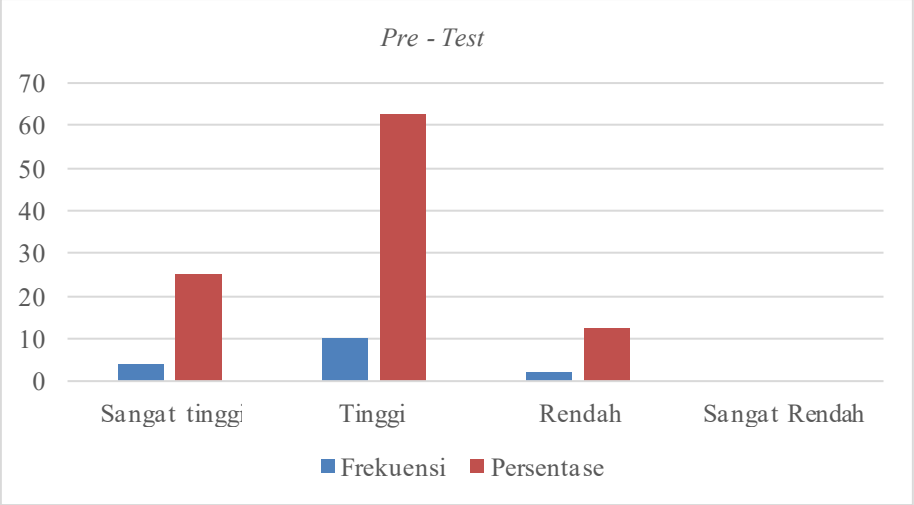

Figure 1. Frequency Distribution Chart of the Pre-test Results

Based on Figure 1, the pre-test results were dominated by the high category, comprising 10 students (62.5%), followed by the very high category with 4 students (25%) and the low category with 2 students (12.5%). No students were classified in the very low category. These results indicate that, prior to the implementation of the treatment, most students' learning engagement was in the high category; however, it was not evenly distributed because some students remained in the low category. This condition suggests that further efforts were required to improve students' learning engagement so that all students could achieve a more optimal level of engagement during the learning process.

b. Descriptive Analysis of Post-test Data

Descriptive analysis of the post-test data was conducted to describe students' learning engagement after the treatment, including the number of samples, minimum score, maximum score, mean, standard deviation, and median. The results of the descriptive statistical analysis of the post-test data are presented in Table 5.

Table 5. Descriptive Statistics of the Post-test Data

Descriptive Statistics	Statistical Value
Number of Samples	16
Minimum Score	81
Maximum Score	100
Mean	91,12
Standard Deviation	5,841

Median	88,50

(Source: IBM SPSS *Statistic Version 25*. 2026)

Based on Table 5, the post-test involved a total of 16 students. The minimum score was 81, while the maximum score was 100. The mean score was 91.12, the standard deviation was 5.841, and the median was 88.50. These findings indicate that students' learning engagement improved after the implementation of video tutorial media and that the data became more homogeneous compared with the condition before the treatment. The frequency and percentage distribution of the post-test data are presented in Table 6.

Table 6. Frequency and Percentage Distribution of the Post-test Results

No	Score	Percentage (%)	Frequency	Categori
1.	81 - 100	100%	16	Very High
2.	61 - 80	0	0	High
3.	41 - 60	0	0	Low
4.	21 - 40	0	0	Very Low
Total		100	16	

(Source: IBM SPSS *Statistic Version 25*. 2026)

Based on Table 6, all students obtained scores in the very high category, totaling 16 students (100%). Meanwhile, no students were classified in the high, low, or very low categories. This indicates that after the implementation of the treatment in the form of video tutorial media, students' learning engagement in the Vocational Concentration subject improved substantially. To provide a clearer illustration of the frequency distribution of the post-test results, the data in Table 6 are presented in the form of a frequency distribution chart, as shown in Figure 2.

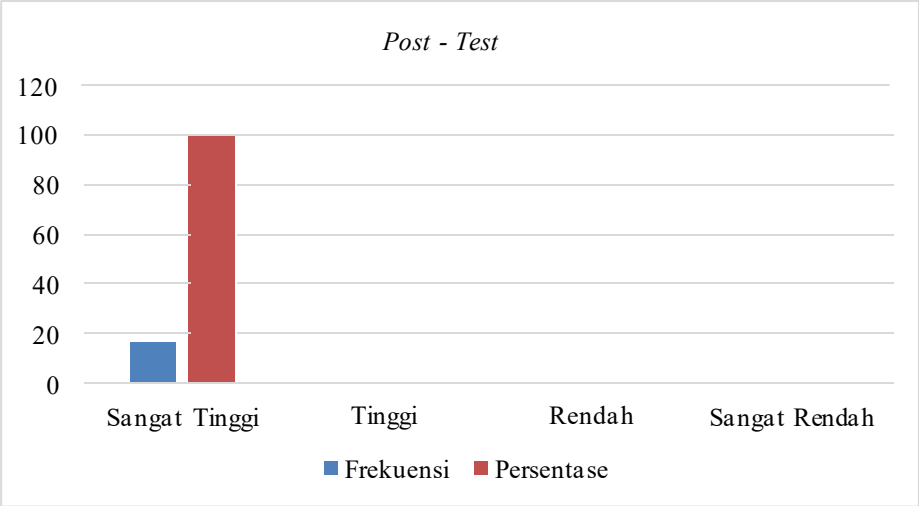

Figure 2. Frequency Distribution Chart of the Post-test Results

Based on Figure 2, all students achieved scores in the very high category, with a frequency of 16 students (100%). No students were categorized as high, low, or very low. This finding indicates that the use of video tutorial media was able to improve students' learning engagement to the extent that all students reached the very high category.

Based on the results of the descriptive statistical analysis, an improvement in students' learning engagement was observed after the implementation of the treatment using video tutorial media. However, to determine whether this improvement was statistically significant, further analysis using inferential statistics was required. Therefore, inferential statistical analysis was conducted to test the proposed research hypothesis.

4.3 Inferential Statistical Analysis

Inferential statistical analysis was conducted to test the research hypothesis and determine whether the use of video tutorial media had an effect on the learning engagement of Grade XI Computer and Network Engineering (TKJ) students at SMK Negeri 4 Bone. Before conducting the hypothesis test, a prerequisite analysis in the form of a normality test was performed to determine whether the research data were normally distributed. The results of the normality test were subsequently used as the basis for determining the appropriate statistical analysis technique for hypothesis testing.

a. Normality Test

The normality test was conducted to ensure that the data met the assumptions required for parametric analysis before hypothesis testing. The decision criterion for the normality test was that if the significance value (Sig.) was greater than 0.05, the data were considered normally distributed; conversely, if the significance value (Sig.) was less than 0.05, the data were considered not normally distributed.

Table 7. Results of the Normality Test

	Shapiro-Wilk		
	Statistic	df	Sig.
Pre-test	.968	16	.806
Post-tset	.893	16	.062

(Source: IBM SPSS *Statistic Version 25*, 2026)

Based on the results of the normality test, the significance value for the pre-test was 0.806 > 0.05, while the significance value for the post-test was 0.062 > 0.05. Therefore, both the pre-test and post-test data were normally distributed. These results indicate that the data satisfied the assumption of normality, allowing the hypothesis to be tested using the Paired Sample t-test.

b. Hypothesis Testing

Hypothesis testing was conducted to determine whether the use of video tutorial media affected the learning engagement of Grade XI Computer and Network Engineering (TKJ) students at SMK Negeri 4 Bone. Since the research data were normally distributed and fulfilled the assumptions for parametric analysis, the hypothesis was tested using the Paired Sample t-test**.** The results of the hypothesis test are presented in Table 8.

Table 8. Results of the Paired Sample t-test

Paired Samples Test								
	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2 tailed)
Pre-test- Post-test	-19.813	14.488	3.622	-27.532	-12.093	-5.470	15	.000

(Source:: IBM SPSS *Statistic Version 25*, 2026)

Based on the results of the Paired Sample t-test, the significance value (Sig. 2-tailed) was 0.000 < 0.05. This finding indicates that the use of video tutorial media had a significant effect on the learning engagement of students in the Vocational Concentration subject of Grade XI Computer and Network Engineering (TKJ) at SMK Negeri 4 Bone. In other words, the research hypothesis was accepted.

The analysis results revealed a significant difference between the conditions before and after the implementation of video tutorial media. These findings indicate that the use of video tutorial media had a positive effect on students'

learning engagement in the Vocational Concentration subject of Grade XI Computer and Network Engineering (TKJ) at SMK Negeri 4 Bone.

4.4 Observation Results

Observations of the implementation of the video tutorial media were conducted to evaluate the implementation of the media during the learning process. The observation results indicated that the video tutorial media were implemented effectively during instruction. Most of the observed aspects received very good ratings, particularly the clarity of material presentation, the systematic sequence of learning procedures, the attractiveness of the media, and the suitability of the materials with the learning objectives. Overall, the implementation of the video tutorial media was consistent with the planned instructional design.

Observations of students' learning engagement were conducted to obtain an overview of students' engagement throughout the learning process. The observation results showed that students actively participated in learning activities. Their engagement was reflected in their participation during the learning process, attention to the instructional materials, enthusiasm for participating in learning activities, and efforts to understand the learning materials and complete the assigned tasks. Overall, the observation findings indicated a high level of learning engagement during the implementation of the video tutorial media.

4.5 Learning Engagement Questionnaire Results

The analysis results showed that students' responses to the behavioral engagement dimension were dominated by positive responses. These findings indicate that students demonstrated active participation during the learning process, paid attention to the presentation of instructional materials, and actively participated in the learning activities provided throughout the implementation of the video tutorial media.

Regarding the emotional engagement dimension, the majority of students provided positive responses toward learning using video tutorial media. These findings indicate that students felt interested, comfortable, and enthusiastic throughout the learning process. No tendency toward negative responses was found for this indicator.

The analysis of the cognitive engagement dimension also showed a predominance of positive responses. These findings indicate that students were mentally engaged in the learning process, made efforts to understand the learning materials, and demonstrated the ability to process and relate the information obtained during learning.

Among the three dimensions, emotional engagement received the highest level of positive responses compared with behavioral engagement and cognitive engagement. Nevertheless, all dimensions demonstrated predominantly positive responses. These findings indicate that the use of video tutorial media was able to support students' learning engagement comprehensively across the behavioral, emotional, and cognitive dimensions.

Overall, the results of the statistical analysis, classroom observations, and questionnaire responses demonstrated a consistent pattern. The use of video tutorial media not only met the criteria for effective implementation but was also accompanied by improvements in students' learning engagement, as reflected in the behavioral, emotional, and cognitive dimensions.

4.6 Discussion

The findings of this study indicate that the use of video tutorial media has a significant effect on students' learning engagement in the Vocational Concentration subject of Grade XI Computer and Network Engineering (TKJ) at SMK Negeri 4 Bone. This effect is reflected in the differences in students' conditions before and after the implementation of the video tutorial media, as supported by the results of statistical analysis, classroom observations, and students' responses to the questionnaire.

The improvement in learning engagement identified in this study can be explained by Mayer's Cognitive Theory of Multimedia Learning. According to this theory, learning becomes more effective when information is presented through

a combination of visual and verbal elements rather than through verbal explanations alone. Video tutorial media integrate images, text, audio, and demonstrations of work procedures, enabling students to acquire more concrete learning experiences. This condition facilitates students' understanding of the learning materials and helps maintain their attention throughout the learning process, ultimately promoting higher levels of learning engagement.

From the perspective of the constructivist theories proposed by Piaget and Vygotsky, video tutorial media provide students with opportunities to construct their own understanding through observing, interpreting, and relating new information to their prior knowledge. The replay feature of video tutorials enables students to learn at their own pace, thereby allowing the knowledge construction process to occur more effectively. Consequently, the improvement in learning engagement observed in this study was influenced not only by the attractiveness of the instructional media but also by the opportunities for active learning provided to students.

The findings also revealed that emotional engagement was the most prominent dimension compared with the other dimensions. This condition may be attributed to the ability of video tutorial media to provide more engaging and less monotonous learning experiences. The integration of visual elements, audio, and systematic demonstrations of work procedures created a more enjoyable learning atmosphere, making students feel comfortable and motivated to participate in learning activities. These findings support the argument of Syawaluddin (2022) who stated that instructional media perform attentional, affective, cognitive, and motivational functions that can enhance students' engagement in learning.

Regarding behavioral engagement, the findings indicate that students became more actively involved in learning activities. This finding can be explained by the fact that video tutorials present work procedures in a sequential and systematic manner, making it easier for students to follow each stage of the learning process. The clarity of the information presented encouraged students to focus more on the learning materials, pay closer attention to the teacher's explanations, and participate more actively in classroom activities. Meanwhile, in terms of cognitive engagement, video tutorial media assisted students in developing a deeper understanding of concepts and work procedures through concrete visual representations. This enabled students to process information more effectively, solve problems more efficiently, and relate newly acquired knowledge to their previous learning experiences.

The findings of this study are consistent with those reported by Putri et al. (2024) who found that video tutorial media were able to improve students' learning activities because the instructional materials became easier to understand and more interesting to learn. The similarity between that study and the present study lies in the use of video tutorials as instructional media capable of enhancing students' engagement throughout the learning process. However, the present study places greater emphasis on learning engagement, encompassing the integrated dimensions of behavioral, emotional, and cognitive engagement.

The findings of this study also support those reported by Irmansyah et al. (2025) who demonstrated that video tutorial media could increase students' learning interest. The similarity lies in the positive responses exhibited by students toward the use of video-based instructional media. However, the study by Irmansyah et al. focused primarily on learning interest as the main variable, whereas the present study examined learning engagement as a broader and multidimensional construct.

Furthermore, the results of this study are consistent with those reported by Amara & Purmadi (2025) who concluded that video tutorial media effectively assisted students in understanding practical learning materials through the systematic presentation of work procedures. The similarity lies in the capability of video tutorial media to support students' comprehension of procedural learning materials. Nevertheless, the present study provides additional empirical evidence that these benefits not only improve students' understanding of the learning materials but also contribute to enhancing their engagement throughout the learning process.

The contribution of this study lies in strengthening the empirical evidence regarding the relationship between the use of video tutorial media and learning engagement within the context of vocational education, particularly in the Vocational Concentration subject at vocational high schools (SMKs). Previous studies have primarily focused on learning outcomes or learning interest, whereas this study comprehensively examined learning engagement through its three primary dimensions: behavioral engagement, emotional engagement, and cognitive engagement.

The novelty of this study lies in measuring the effect of video tutorial media on multidimensional learning engagement among vocational high school students by employing a combination of questionnaire data, classroom observations, and inferential statistical analysis. This approach provides a more comprehensive understanding of how video tutorial media influence students' engagement throughout the learning process.

The practical implications of this study indicate that video tutorial media can serve as an effective alternative instructional medium for enhancing students' engagement, particularly in subjects involving work procedures and practical skills. Therefore, teachers are encouraged to utilize video tutorials as part of their instructional strategies to create learning experiences that are more interactive, engaging, and student-centered. As students' learning engagement increases, the opportunity to achieve a more effective learning process also becomes greater.

5. Conclusion

This study aimed to analyze the effect of using video tutorial media on the learning engagement of students in the Vocational Concentration subject of Grade XI Computer and Network Engineering (TKJ) at SMK Negeri 4 Bone. Based on the results of the analysis and discussion, it can be concluded that video tutorial media have a positive and significant effect on students' learning engagement. The use of video tutorial media was able to support students' engagement more effectively across the behavioral, emotional, and cognitive dimensions throughout the learning process.

This study provides an empirical contribution by strengthening the body of knowledge regarding the use of video tutorial media as an instructional medium that not only supports students' understanding of learning materials but also enhances their learning engagement. In addition, this study enriches the literature on learning engagement by examining students' engagement multidimensionally through the aspects of behavioral engagement, emotional engagement, and cognitive engagement within the context of vocational education at vocational high schools.

From a practical perspective, the findings indicate that video tutorial media can be utilized as an effective alternative instructional medium for creating learning experiences that are more engaging, interactive, and student -centered. Therefore, teachers are encouraged to use video tutorials to support the delivery of both procedural and practical learning materials, thereby increasing students' engagement throughout the learning process.

Nevertheless, this study has several limitations, including the use of a one-group pretest–posttest design without a control group, a relatively small sample size, and a limited research period. These conditions limit the generalizability of the findings to broader populations.

Based on these limitations, future studies are recommended to employ experimental designs involving control groups, larger sample sizes, and more diverse educational levels and subject areas. Future research may also investigate the effect of video tutorial media on other variables, such as learning outcomes, learning motivation, or critical thinking skills, in order to provide a more comprehensive understanding of the effectiveness of video tutorial media in the learning process.

Acknowledgements

The authors would like to express their sincere gratitude to all parties who contributed to the completion of this research. The authors also extend their appreciation to all respondents who willingly participated and cooperated throughout the research process.

References

Amara, R., & Purmadi, A. (2025). Efektivitas Penggunaan Video Tutorial terhadap Keterampilan Mahasiswa Teknologi Pendidikan pada Mata Kuliah Praktik Perancangan Web Pembelajaran. *Inovasi Tenaga Pendidik dan Kependidikan*, *5*(2), 64–73.

Amir, A., Hajar, A., Hasanuddin, & Rasyid, A. T. (2024). *Belajar dan Pembelajaran Mengungkap Problematika Serta Solusi Menuju Peningkatan Prestasi Peserta Didik* (A. T. Rasyid (ed.)). Resota Mediatama Anggota IKAPI.

Aulia, U., Efriyanti, L., & Munardi, A. (2023). Pengaruh Penggunaan Media Pembelajaran Berbasis Video Tutorial Terhadap Hasil Belajar Bimbingan TIK Pada Kelas X Di SMAN 1 BATAHAN. *Jurnal Ilmu Sosial, Bahasa dan Pendidikan*, *3*(1), 140–148.

Cantika, A. S. (2022). Efektifitas Penggunaan Video Tutorial Sebagai Media Pembelajaran Tari Di Sanggar. *pendidikan sendratasik*, *11*(2), 305–317.

Fredricks, J. A., & Paris, A. H. (2016). School Engagement : Potential of the Concept, State of the Evidence. *Review of Educational Research*, *74*(1), 59–109. https://doi.org/https://doi.org/10.3102/00346543074001059

Heilporn, G., & Lakhal, S. (2021). The International Journal of Management Education, 19 , 1 -12. *International Journal of Management Education*, *19*(1), 1–25. https://doi.org/https://doi.org/10.1016/j.ijme.2021.100454

Irmansyah, A., Ernita, M., Nur, G., Depi, F., Harahap, S., Studi, P., Ekonomi, P., Islam, U., Sultan, N., Kasim, S., & Belajar, M. (2025). Pengaruh Penggunaan Media Pembelajaran Berbasis Video Tutorial terhadap Minat Belajar Siswa pada Materi Komputer Akuntansi MYOB di SMK Muhammadiyah 2 Pekanbaru. *Riset Mahasiswa Pendidikan Ekonomi*, *2*(1), 119–132.

Khosiyono, B. H. C., Fajarudin, M., Jayanti, E. D., Sari, R. V., & Srikonita, R. (2022). *Teori dan Pengembangan Pembelajaran Berbasis Teknologi Digital di Sekolah Dasar* (B. H. C. Khosiyono (ed.)). CV. Budi Utama.

Nabar, R. J., Bouty, A. A., Yassin, R. M. T., & Da I, R. H. (2023). Pengembangan Media Pembelajaran Berbantuan Video Tutorial Pada Praktek. *Journal of Information Technology Education* , *3*(1).

Nugraha, R. A., & Iskandar, M. Y. (2024). DEVELOPMENT OF VIDEO TUTORIALS AS A MEDIA FOR LEARNING GRAPHIC DESIGN IN VOCATIONAL HIGH. *JERIT: Journal of Educational Research and Innovation Technology*, *1*(1), 1–11.

Putri, R., Darmawati, G., Rahayu, D. S., & Kunci, K. (2024). Pemanfaatan Media Pembelajaran Vidio Tutorial Terhadap Hasil Belajar Siswa Kelas X di SMKN 1 Dua Koto. *Journal of Educational Management and Strategy*, *03*(02).

Shao, Y., & Kang, S. (2022). The association between peer relationship and learning engagement among adolescents: The chain mediating roles of self-efficacy and academic resilience. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.938756

Sumantri, U. (2019). Penggunaan Video Tutorial Dalam Upaya Meningkatkan. *Metadukasi*, *1*(2), 54.