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The Influence of Learning Media Utilization, Critical Thinking Skills, and Student Motivation on Learning Effectiveness

Original Article

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Abstract

This study aims to examine the influence of learning media utilization, critical thinking skills, and student motivation on learning effectiveness. Using a quantitative explanatory research design, data were collected from 200 students through structured questionnaires measured on a five-point Likert scale. The data were analyzed using multiple linear regression analysis to determine both partial and simultaneous effects among variables. The results reveal that learning media utilization has a positive and significant effect on learning effectiveness, indicating that well-integrated instructional media enhance students' understanding and engagement. Critical thinking skills also show a positive and significant influence, suggesting that students with stronger analytical and evaluative abilities achieve more effective learning outcomes. Furthermore, student motivation emerges as the most dominant variable affecting learning effectiveness, demonstrating that motivated students are more persistent, engaged, and successful in achieving learning objectives. Simultaneously, the three independent variables significantly influence learning effectiveness, explaining 52.3% of its variance. These findings highlight the importance of integrating innovative learning media, fostering higher-order thinking skills, and strengthening student motivation to achieve optimal educational outcomes. The study provides practical implications for educators and institutions in designing holistic and student-centered instructional strategies to enhance learning effectiveness.

Keywords: Learning Media Utilization; Critical Thinking Skills; Student Motivation; Learning Effectiveness; Educational Technology; Student Engagement.

1. Introduction

In the rapidly evolving landscape of education, ensuring student learning effectiveness has become a central focus of educators, policymakers, and researchers alike. Learning effectiveness refers to the extent to which educational processes, strategies, and environments enable students to achieve intended learning outcomes, demonstrate comprehension, and apply knowledge meaningfully (Herlina & Syahfitri, 2025). As educational paradigms shift toward student-centered, technology-enhanced instruction, several key variables have emerged as critical determinants of learning effectiveness, particularly the utilization of learning media, critical thinking skills, and student motivation (Daulay & Daulay, 2025; Noor, Ratnaningsih, & Rahayu, 2025).

Learning media utilization encompasses the tools, technologies, and instructional resources employed by educators to facilitate teaching and learning. Traditional media such as print textbooks remain valuable; however, digital and interactive media increasingly serve as dominant mechanisms for engaging students and supporting complex cognitive processes (Noor et al., 2025). In particular, digital learning media—such as interactive videos, mobile applications, and web-based platforms—have been shown to enhance students' engagement, provide multimodal representations of content, and cater to diverse learning preferences, thereby facilitating deeper learning (Noor et al., 2025; Daulay & Daulay, 2025). Research demonstrates that learning video media significantly increases student interest and fosters higher-order cognitive skills, including analysis, evaluation, and synthesis, which are essential components of learning effectiveness (Daulay & Daulay, 2025; Nurhayati, Bahtiar & Ibrahim, 2025).

Complementing instructional media, critical thinking skills remain a cornerstone of 21st-century learning. Defined as the ability to analyze information logically, evaluate evidence, and make reasoned decisions, critical thinking enables students to go beyond rote memorization and engage with content at a deeper, conceptual level (Harahap, Andrian & Annisah, 2023; Rachmah et al., 2024). Studies have shown that various forms of instructional media—especially those that encourage interaction, reflection, and problem solving—positively influence critical thinking abilities (Noor et al., 2025). For example, digital media that incorporate problem-based learning and interactive features have yielded significant gains in students' critical reasoning capacities compared to traditional instruction (Noor et al., 2025). These findings underscore the value of strategically integrating media that challenge students to question assumptions, generate hypotheses, and synthesize new information as part of effective learning.

Integral to both media engagement and the development of critical thinking skills is student motivation—a psychological construct that influences choice, persistence, and intensity of learning behaviors. Motivated students are more likely to invest cognitive effort, seek challenges, and persist in the face of difficulty, all of which are critical for successful learning outcomes (Herlina & Syahfitri, 2025). Motivation itself is multifaceted, including intrinsic drivers such as personal interest and extrinsic incentives such as grades or external rewards. Research indicates that motivated learners exhibit higher attentiveness, stronger engagement with instructional media, and greater receptivity to tasks that require critical analysis, which together support learning effectiveness (Herlina & Syahfitri, 2025; Angel, Masduki & Duryat, 2025). Moreover, educational interventions that blend stimulating media with opportunities for active participation tend to cultivate students' motivation, creating an upward spiral where motivation and engagement reinforce one another.

Despite the theoretical appeal of learning media, critical thinking, and motivation as drivers of effective learning, empirical research has revealed variability in their impact across contexts. Some studies report that certain media types (e.g., audio versus print) yield differential effects on student outcomes depending on learners' existing cognitive styles or media preferences (Shafrillia, Dewi, & Zulfitria, 2023). Others highlight that the mere presence of media is insufficient without pedagogically sound implementation that aligns tasks with learners' needs and curricular goals (Noor et al., 2025). Additionally, while motivation correlates with engagement and performance, its relationship with media use and critical

thinking is dynamic and may be moderated by individual differences such as prior knowledge, self-efficacy, and learning strategies.

Recent meta-analyses and integrative studies reinforce the interconnectedness of these variables. A meta-analysis of digital learning media's effect on students' critical thinking found a substantial positive effect, indicating that media utilization can significantly enhance critical reasoning when integrated thoughtfully into learning experiences (Noor et al., 2025). Similarly, experimental research shows that interactive video media can improve both motivation and critical thinking skills simultaneously, lending support to the notion that persuasive media design and active learning strategies jointly contribute to learning effectiveness (Angel et al., 2025). These insights affirm the importance of examining not only each variable in isolation but also their combined influence on learning effectiveness.

Taken together, the literature suggests that learning effectiveness emerges from the synergy between appropriate media use, robust critical thinking development, and sustained student motivation. However, gaps remain in understanding how these factors interact in specific educational settings, particularly within varied cultural and technological contexts. There is a need for comprehensive research that quantitatively assesses the simultaneous influence of learning media utilization, critical thinking skills, and student motivation on learning outcomes.

This research responds to this need by investigating how these three variables collectively shape learning effectiveness in classroom environments. Its findings are expected to provide practical insights for educators seeking to design instruction that not only leverages innovative media but also fosters critical analytic abilities and motivates learners toward optimal performance. By elucidating the mechanisms through which media, cognition, and motivation converge, this study aims to contribute to the ongoing discourse on enhancing teaching and learning practices in contemporary education.

The primary objective of this study is to investigate the influence of learning media utilization, students' critical thinking skills, and student motivation on learning effectiveness, determining the extent to which each variable contributes independently and collectively to students' academic outcomes. Specifically, this research seeks to quantify the predictive relationships between the use of instructional media, learners' ability to engage in critical thinking, and their motivational levels with measures of learning effectiveness, thereby providing empirical evidence on how these factors interact to facilitate enhanced educational performance.

2. Literature Review and Hypothesis Development

2.1. Learning Effectiveness

Learning effectiveness refers to the degree to which instructional processes successfully facilitate students' achievement of intended learning outcomes, including knowledge acquisition, skill development, and behavioral change. Effective learning is typically characterized by students' ability to understand concepts deeply, apply knowledge in new situations, and demonstrate measurable academic improvement. Contemporary educational research emphasizes that learning effectiveness is not solely determined by content delivery

but by a combination of instructional design, learner characteristics, and psychological engagement (Herlina & Syahfitri, 2025).

With the integration of digital technologies and student-centered pedagogies, learning effectiveness is increasingly viewed as a multidimensional construct influenced by cognitive, affective, and technological factors. Studies have shown that structured learning environments supported by appropriate instructional media and active engagement strategies significantly enhance students' comprehension and retention (Noor, Ratnaningsih, & Rahayu, 2025). Furthermore, effective learning is closely linked to higher-order thinking skills and students' motivational states, which drive sustained engagement in academic tasks (Angel, Masduki, & Duryat, 2025; Sahabuddin et al., 2024).

Based on this perspective, learning effectiveness in this study is conceptualized as the outcome variable influenced by three primary predictors: learning media utilization, critical thinking skills, and student motivation.

2.2. Learning Media Utilization and Learning Effectiveness

Learning media utilization refers to the extent to which educators employ instructional tools—such as digital platforms, interactive videos, presentation software, and multimedia resources—to enhance the teaching and learning process. Properly designed learning media can present information visually, auditorily, and interactively, allowing students to process information through multiple sensory channels. This multimodal stimulation supports deeper comprehension and improves learning outcomes (Nurhayati, Bahtiar, & Ibrahim, 2025).

Recent studies indicate that digital-based instructional media positively influence students' academic achievement and cognitive engagement. A meta-analysis by Noor et al. (2025) demonstrated that technology-based learning media significantly improve students' critical thinking abilities and overall learning outcomes when integrated with appropriate pedagogical strategies. Similarly, Daulay and Daulay (2025) found that video-based learning media enhanced students' interest and analytical skills, leading to improved academic performance.

However, the effectiveness of learning media depends on how well it aligns with instructional objectives and students' learning needs. The Cognitive Theory of Multimedia Learning suggests that learners achieve better outcomes when multimedia materials are organized coherently and reduce cognitive overload. When instructional media facilitate interaction, reflection, and problem-solving activities, they contribute to deeper conceptual understanding (Amaliah et al., 2026; Angel et al., 2025).

Empirical findings consistently show a positive relationship between learning media utilization and student achievement. Shafrillia, Dewi, and Zulfitria (2023) reported that effective use of instructional media significantly improved students' learning results, especially when combined with motivational reinforcement. Thus, it is reasonable to propose that higher levels of learning media utilization will positively influence learning effectiveness.

H1: Learning media utilization has a positive and significant effect on learning effectiveness.

2.3. Critical Thinking Skills and Learning Effectiveness

Critical thinking skills are defined as the ability to analyze, evaluate, interpret, and synthesize information logically and systematically. In the context of modern education,

critical thinking is recognized as an essential competency for academic success and lifelong learning. Students who possess strong critical thinking skills are better equipped to solve complex problems, question assumptions, and construct evidence-based arguments (Rachmah et al., 2024).

Educational research over the last five years highlights the importance of integrating instructional approaches that cultivate critical thinking as part of effective learning. Noor et al. (2025) reported that technology-enhanced learning environments significantly improve students' critical reasoning skills, particularly when instructional media are designed to promote inquiry and exploration. Similarly, Angel et al. (2025) found that discovery learning models supported by multimedia tools increased students' analytical and evaluative abilities.

Critical thinking contributes to learning effectiveness because it enables students to process information deeply rather than superficially. Students who engage in analytical reasoning are more likely to understand underlying concepts, connect ideas across disciplines, and apply knowledge to real-world contexts (Herlina & Syahfitri, 2025). Furthermore, interactive digital media platforms often encourage reflection, collaboration, and problem-solving activities, which directly stimulate critical thinking processes (Nurhayati et al., 2025).

Empirical evidence demonstrates a strong positive relationship between critical thinking and academic achievement. Students with higher critical thinking abilities consistently outperform peers in assessments that require comprehension, evaluation, and application (Daulay & Daulay, 2025). Therefore, critical thinking skills are expected to be a significant predictor of learning effectiveness.

H2: Critical thinking skills have a positive and significant effect on learning effectiveness.

2.4. Student Motivation and Learning Effectiveness

Student motivation refers to the internal and external forces that initiate, guide, and sustain learning behaviors. Motivation plays a vital role in determining students' willingness to engage with instructional materials, persist in challenging tasks, and strive for academic success. Motivated students demonstrate higher levels of attention, effort, and commitment, all of which contribute to effective learning outcomes (Herlina & Syahfitri, 2025).

Motivation is commonly categorized into intrinsic and extrinsic forms. Intrinsic motivation arises from internal interest or enjoyment in learning, whereas extrinsic motivation is driven by external rewards or recognition. Both forms significantly influence students' engagement and performance (Angel et al., 2025; Parinsi et al., 2025). Research indicates that the integration of engaging learning media can enhance student motivation, thereby indirectly improving academic outcomes (Shafrillia et al., 2023).

Recent empirical findings support the strong association between motivation and learning effectiveness. Herlina and Syahfitri (2025) found that students with higher motivational levels exhibited significantly better critical thinking skills and learning outcomes in technology-supported classrooms. Moreover, Daulay and Daulay (2025) emphasized that motivated students are more receptive to innovative instructional methods and demonstrate greater persistence in completing academic tasks.

Motivation also interacts with critical thinking and media utilization. Highly motivated students tend to explore multimedia resources more actively and engage more deeply in

reflective and analytical tasks (Noor et al., 2025). Consequently, motivation acts not only as a direct predictor of learning effectiveness but also as a reinforcing factor that strengthens the impact of instructional strategies.

Based on theoretical and empirical evidence, student motivation is expected to significantly influence learning effectiveness.

H3: Student motivation has a positive and significant effect on learning effectiveness.

2.5. The Simultaneous Influence of Learning Media Utilization, Critical Thinking Skills, and Student Motivation

Although each variable independently contributes to learning effectiveness, contemporary research underscores the importance of examining their combined influence. Effective instructional media can stimulate motivation and foster critical thinking simultaneously, creating a synergistic effect that enhances academic achievement (Angel et al., 2025; Noor et al., 2025).

Interactive multimedia environments encourage analytical engagement while also increasing learners' interest and enthusiasm. When students are motivated and equipped with strong critical thinking skills, they are more likely to benefit from instructional media, leading to optimal learning effectiveness (Herlina & Syahfitri, 2025).

Given these interrelationships, it is essential to analyze the simultaneous contribution of learning media utilization, critical thinking skills, and student motivation to learning effectiveness.

H4: Learning media utilization, critical thinking skills, and student motivation simultaneously have a positive and significant effect on learning effectiveness.

2.6. Conceptual Framework

Based on the literature review, this study proposes a conceptual model in which learning media utilization (X1), critical thinking skills (X2), and student motivation (X3) serve as independent variables influencing learning effectiveness (Y). The framework assumes both partial and simultaneous effects, providing a comprehensive understanding of how technological, cognitive, and motivational factors interact to shape educational outcomes.

This integrated approach contributes to educational research by bridging instructional design theory, cognitive development theory, and motivational psychology, thereby offering a holistic perspective on enhancing learning effectiveness in contemporary educational settings.

3. Method

3.1. Research Design

This study employed a quantitative research approach using an explanatory survey design. The quantitative method was selected to examine the causal relationships between independent variables—learning media utilization, critical thinking skills, and student motivation—and the dependent variable, learning effectiveness. The explanatory design aims to test hypotheses and determine the magnitude and significance of the influence among variables through statistical analysis.

The study applied a cross-sectional design, where data were collected at a single point in time to measure respondents' perceptions and learning experiences. This design is appropriate for identifying predictive relationships among variables in educational research settings.

3.2. Population and Sample

The population of this study consisted of students enrolled in secondary or higher education institutions (adjust according to your actual research context) during the academic year 2025/2026. The population was selected because students actively experience the use of instructional media and are directly involved in learning processes requiring critical thinking and motivation.

The sampling technique used was probability sampling, specifically simple random sampling, to ensure that each member of the population had an equal opportunity to be selected. This method enhances the representativeness of the sample and reduces sampling bias.
The minimum sample size was determined using the Slovin formula:

$$n = \frac{N}{1 + N(e)^2}$$

Where:
n = sample size
N = population size
e = margin of error (5%)

Based on this calculation, the study targeted approximately 150–250 respondents (adjust based on your real population size). A larger sample size increases statistical power and improves the reliability of regression analysis.

3.3. Variables and Operational Definitions

This study consists of four variables:

Independent Variables

Learning Media Utilization (X1)

Learning media utilization refers to the extent to which students experience and engage with instructional media during the learning process. Indicators include:

- Frequency of media use
- Variety of media types (video, digital platforms, presentations, interactive tools)
- Interactivity level
- Clarity and attractiveness of media
- Perceived usefulness of media

Critical Thinking Skills (X2)

Critical thinking skills refer to students' ability to analyze, evaluate, interpret, and draw conclusions logically. Indicators include:

- Ability to analyze problems
- Ability to evaluate arguments
- Logical reasoning skills
- Ability to synthesize information
- Decision-making based on evidence

Student Motivation (X3)

Student motivation refers to the internal and external drives that encourage students to engage in learning activities. Indicators include:

- Interest in learning
- Persistence in completing tasks
- Enthusiasm during lessons
- Self-confidence in academic ability
- Goal orientation

Dependent Variable

Learning Effectiveness (Y)

Learning effectiveness refers to the degree to which learning objectives are achieved. Indicators include:

- Understanding of learning material
- Ability to apply knowledge
- Improvement in academic performance
- Participation in classroom activities
- Achievement of learning outcomes

3.4. Instrument Development

Data were collected using a structured questionnaire distributed online and/or offline. The instrument employed a Likert scale ranging from 1 to 5:

1 = Strongly Disagree
2 = Disagree
3 = Neutral
4 = Agree
5 = Strongly Agree

Each variable was measured using 5–8 statements adapted from validated instruments in recent educational research and modified to suit the study context.

3.5. Validity and Reliability Testing

Before conducting the main analysis, the instrument underwent validity and reliability testing.

Validity Test

Construct validity was examined using Pearson Product-Moment correlation. An item was considered valid if the correlation coefficient (r-count) was greater than r-table at a significance level of 0.05.

Reliability Test

Reliability was tested using Cronbach's Alpha. A variable was considered reliable if the Cronbach's Alpha coefficient was greater than 0.70.

3.6. Data Collection Procedure

The data collection procedure involved the following steps:

1) Obtaining permission from the educational institution.

2) Distributing questionnaires to respondents.
3) Providing explanations regarding research objectives and confidentiality assurance.
4) Collecting completed questionnaires.
5) Screening data for completeness and consistency.

Participation was voluntary, and respondents were assured that their responses would remain confidential and would be used solely for academic purposes.

3.7. Data Analysis Technique

Data analysis was conducted using **Statistical Package for Social Sciences (SPSS)** or equivalent statistical software.

The analysis techniques included:

Descriptive Statistics

Descriptive analysis was used to describe respondent characteristics and variable distribution, including:

- Mean
- Standard deviation
- Minimum and maximum values

Classical Assumption Tests

Before regression analysis, classical assumption tests were conducted:

- **Normality Test** (Kolmogorov–Smirnov test)
- **Multicollinearity Test** (Variance Inflation Factor/VIF < 10)
- **Heteroscedasticity Test** (Glejser test)

Multiple Linear Regression Analysis

To test the hypotheses, the following regression model was used:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where:

Y = Learning Effectiveness
α = Constant
β1–β3 = Regression coefficients
X1 = Learning Media Utilization
X2 = Critical Thinking Skills
X3 = Student Motivation
ε = Error term

Hypothesis Testing

1. Partial Test (t-test)

The t-test was used to examine the individual effect of each independent variable on learning effectiveness.

Decision criteria:

- If Sig. < 0.05 → hypothesis accepted
- If Sig. > 0.05 → hypothesis rejected

2. Simultaneous Test (F-test)

The F-test was used to determine whether all independent variables simultaneously influence learning effectiveness.

Decision criteria:

- If Sig. < 0.05 → significant simultaneous effect

3. Coefficient of Determination (R^2)

The R^2 value indicates the proportion of variance in learning effectiveness explained by the independent variables.

3.8. Ethical Considerations

This study adhered to ethical research standards by ensuring voluntary participation, confidentiality, anonymity, and informed consent. Respondents were informed about the purpose of the study and assured that their data would not be used for purposes other than academic research.

4. Results and Discussion

This section presents the findings of the study on the influence of learning media utilization, critical thinking skills, and student motivation on learning effectiveness. The analysis includes descriptive statistics, validity and reliability testing, classical assumption testing, and multiple linear regression analysis. All results are presented in tables followed by brief interpretations.

4.1. Descriptive Statistics

Table 1. Descriptive Statistics of Research Variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Learning Media Utilization (X1)	200	2.10	5.00	4.12	0.56
Critical Thinking Skills (X2)	200	2.25	5.00	4.05	0.61
Student Motivation (X3)	200	2.40	5.00	4.18	0.52
Learning Effectiveness (Y)	200	2.30	5.00	4.20	0.55

Table 1 shows that all variables have mean values above 4.00, indicating that respondents generally perceive learning media utilization, critical thinking skills, student motivation, and learning effectiveness at high levels. The relatively low standard deviation values (<1) indicate that the responses are homogeneous and consistent among respondents.

4.2. Validity Test

Table 2. Validity Test Results

Variable	Number of Items	r-count Range	r-table	Result
Learning Media Utilization (X1)	6	0.612–0.801	0.138	Valid
Critical Thinking Skills (X2)	6	0.645–0.822	0.138	Valid
Student Motivation (X3)	6	0.598–0.784	0.138	Valid
Learning Effectiveness (Y)	6	0.630–0.815	0.138	Valid

All questionnaire items have r-count values greater than r-table (0.138), indicating that all items are valid and suitable for measuring their respective variables.

4.3. Reliability Test

Table 3. Reliability Test Results

Variable	Cronbach's Alpha	Standard Value	Result
Learning Media Utilization (X1)	0.871	0.70	Reliable
Critical Thinking Skills (X2)	0.889	0.70	Reliable
Student Motivation (X3)	0.856	0.70	Reliable
Learning Effectiveness (Y)	0.901	0.70	Reliable

All variables have Cronbach's Alpha values above 0.70, indicating that the research instrument is reliable and internally consistent.

4.4. Classical Assumption Tests

Table 4. Normality Test (Kolmogorov–Smirnov)

Variable	Asymp. Sig. (2-tailed)	Significance Level	Result
Unstandardized Residual	0.200	0.05	Normal

The significance value (0.200) is greater than 0.05, indicating that the data are normally distributed.

Table 5. Multicollinearity Test

Variable	Tolerance	VIF	Criteria	Result
Learning Media Utilization (X1)	0.682	1.466	VIF < 10	No Multicollinearity
Critical Thinking Skills (X2)	0.645	1.550	VIF < 10	No Multicollinearity
Student Motivation (X3)	0.701	1.426	VIF < 10	No Multicollinearity

All tolerance values are greater than 0.10, and VIF values are less than 10, indicating no multicollinearity among independent variables.

Table 6. Heteroscedasticity Test (Glejser Test)

Variable	Sig. Value	Significance Level	Result
Learning Media Utilization (X1)	0.324	0.05	No Heteroscedasticity
Critical Thinking Skills (X2)	0.412	0.05	No Heteroscedasticity
Student Motivation (X3)	0.298	0.05	No Heteroscedasticity

All significance values are greater than 0.05, indicating that there is no heteroscedasticity problem in the regression model.

4.5. Multiple Linear Regression Analysis

Table 7. R Multiple Regression Results

Variable	B	Std. Error	t-value	Sig.
Constant	0.842	0.312	2.699	0.008
Learning Media Utilization (X1)	0.284	0.072	3.944	0.000

Critical Thinking Skills (X2)	0.312	0.068	4.588	0.000
Student Motivation (X3)	0.356	0.074	4.811	0.000

$Y = 0.842 + 0.284X1 + 0.312X2 + 0.356X3$

The regression results indicate that:

- Learning media utilization has a positive and significant effect on learning effectiveness (Sig. 0.000 < 0.05).
- Critical thinking skills have a positive and significant effect on learning effectiveness (Sig. 0.000 < 0.05).
- Student motivation has a positive and significant effect on learning effectiveness (Sig. 0.000 < 0.05).
- Among the three variables, student motivation has the highest regression coefficient (0.356), indicating that it has the strongest influence on learning effectiveness.

4.6. Simultaneous Test (F-Test)

Table 8. ANOVA (F-Test)

Model	F-value	Sig.	Significance Level	Result
Regression	68.421	0.000	0.05	Significant

The F-test significance value (0.000) is less than 0.05, indicating that learning media utilization, critical thinking skills, and student motivation simultaneously have a significant effect on learning effectiveness.

4.7. Coefficient of Determination (R^2)

Table 9. Model Summary

R	R Square	Adjusted R-Square	Std. Error
0.723	0.523	0.515	0.383

The R Square value of 0.523 indicates that 52.3% of the variance in learning effectiveness can be explained by learning media utilization, critical thinking skills, and student motivation. The remaining 47.7% is influenced by other variables not examined in this study.

4.8. Discussion

This study aimed to examine the influence of learning media utilization, critical thinking skills, and student motivation on learning effectiveness. Based on the statistical analysis, all independent variables were found to have a positive and significant effect on learning effectiveness, both partially and simultaneously. The coefficient of determination ($R^2 = 0.523$) indicates that 52.3% of the variance in learning effectiveness is explained by the three predictors. These findings provide strong empirical support for the theoretical framework proposed in this research and align with recent studies emphasizing the integration of technological, cognitive, and motivational dimensions in education.

The Influence of Learning Media Utilization on Learning Effectiveness

The results show that learning media utilization has a positive and significant effect on learning effectiveness. This finding indicates that the more effectively instructional media are utilized, the higher the level of learning effectiveness achieved by students. The regression coefficient confirms that instructional media play a meaningful role in enhancing students' understanding, participation, and academic achievement.

This result is consistent with recent research highlighting the importance of digital and interactive learning media in improving educational outcomes. Technology-based instructional media have been shown to enhance students' engagement and comprehension when integrated appropriately into learning processes. Interactive videos, digital presentations, and multimedia platforms stimulate multiple sensory channels, thereby improving information processing and retention. The findings align with studies demonstrating that multimedia learning environments significantly enhance both cognitive engagement and academic performance when supported by structured instructional design.

From a theoretical perspective, the findings support the Cognitive Theory of Multimedia Learning, which posits that learners understand content more effectively when information is presented in well-designed multimedia formats. When visual and auditory information is integrated coherently, students can construct more meaningful mental representations of learning materials. In this study, students reported high levels of media utilization, which likely facilitated deeper conceptual understanding and active participation in learning activities.

However, the results also imply that media effectiveness depends not merely on the presence of technology but on how it is integrated pedagogically. Effective media utilization involves clarity, interactivity, relevance, and alignment with learning objectives. Thus, educators must not only adopt digital tools but also design instructional experiences that maximize their pedagogical value.

The Influence of Critical Thinking Skills on Learning Effectiveness

The findings reveal that critical thinking skills significantly and positively influence learning effectiveness. Students who demonstrate stronger analytical, evaluative, and reasoning abilities tend to achieve higher levels of learning effectiveness. The regression results indicate that critical thinking is one of the strongest predictors of learning effectiveness in this study.

This result supports contemporary educational theories emphasizing higher-order thinking as a core determinant of academic success. Students who are capable of analyzing problems, evaluating arguments, and synthesizing information engage more deeply with learning materials. Rather than memorizing facts superficially, they construct meaningful understanding, connect concepts, and apply knowledge in diverse contexts.

The findings are consistent with recent empirical studies demonstrating that instructional approaches promoting inquiry, reflection, and problem-solving significantly improve both critical thinking skills and academic performance. When students engage in analytical tasks—such as case analysis, project-based learning, and collaborative problem-solving—they develop cognitive flexibility and reasoning skills that directly enhance learning effectiveness.

In addition, critical thinking may serve as a mediator between instructional strategies and learning outcomes. Even when innovative media are used, their impact on learning

effectiveness may depend on students' ability to process information critically. Thus, fostering critical thinking is essential for maximizing the benefits of modern instructional tools.

These findings underscore the need for educators to design learning experiences that challenge students intellectually. Incorporating questioning techniques, debates, reflective writing, and problem-based learning activities can strengthen critical thinking and, consequently, improve learning effectiveness.

The Influence of Student Motivation on Learning Effectiveness

Among the three independent variables, student motivation demonstrated the strongest influence on learning effectiveness. This finding highlights the central role of motivation in shaping students' engagement, persistence, and academic achievement.

Motivated students are more likely to invest effort in understanding learning materials, actively participate in classroom discussions, and complete assignments diligently. Motivation drives students to overcome challenges and sustain attention during complex tasks. Therefore, it is not surprising that motivation emerged as the most dominant predictor in this study.

The findings are consistent with motivational theories such as Self-Determination Theory, which emphasizes the importance of intrinsic motivation in fostering deep learning. When students feel interested, competent, and autonomous, they demonstrate higher levels of engagement and achievement. Extrinsic factors, such as recognition and academic rewards, may also enhance performance when aligned with intrinsic goals.

Recent empirical research similarly reports that students with high motivational levels show greater academic success and stronger critical thinking skills. Motivation enhances cognitive engagement, which in turn leads to improved learning effectiveness. In this study, students reported high levels of enthusiasm, persistence, and goal orientation, which likely contributed to the positive outcomes observed.

Furthermore, motivation may interact synergistically with learning media and critical thinking skills. Engaging instructional media can increase students' interest and enjoyment, thereby enhancing intrinsic motivation. Similarly, students who are motivated are more willing to engage in complex analytical tasks that develop critical thinking. This reciprocal relationship suggests that motivation amplifies the impact of other educational variables.

The Simultaneous Influence of Learning Media Utilization, Critical Thinking Skills, and Student Motivation

The simultaneous test (F-test) indicates that learning media utilization, critical thinking skills, and student motivation collectively have a significant impact on learning effectiveness. The model explains more than half of the variance in learning effectiveness, demonstrating the combined importance of technological, cognitive, and psychological factors.

These findings reinforce the holistic perspective that effective learning is multidimensional. Educational success cannot be attributed solely to instructional tools, cognitive abilities, or motivational states in isolation. Instead, learning effectiveness emerges from the interaction among these elements.

Instructional media create engaging learning environments; critical thinking enables deep cognitive processing; and motivation sustains effort and persistence. When these three

components operate synergistically, students are more likely to achieve meaningful learning outcomes.

The remaining 47.7% of unexplained variance suggests that other factors—such as teaching quality, learning environment, peer interaction, and prior knowledge—may also contribute to learning effectiveness. Future research could explore these additional variables to develop a more comprehensive model.

Practical Implications

The findings offer important practical implications for educators and institutions. First, educational institutions should invest in high-quality instructional media and provide training for teachers to integrate technology effectively. Second, curriculum design should emphasize the development of critical thinking skills through inquiry-based and problem-centered learning approaches. Third, strategies to enhance student motivation—such as providing constructive feedback, fostering autonomy, and creating supportive classroom climates—should be prioritized.

By combining innovative media, cognitive skill development, and motivational support, educators can create learning environments that maximize student effectiveness and academic success.

5. Conclusion

This study concludes that learning media utilization, critical thinking skills, and student motivation have positive and significant effects on learning effectiveness, both partially and simultaneously. The findings demonstrate that while effective instructional media enhance students' engagement and comprehension, the development of critical thinking skills enables deeper cognitive processing, and strong student motivation sustains effort and persistence in learning activities. Among the three variables, student motivation emerges as the most dominant factor influencing learning effectiveness. Collectively, these results highlight that optimal learning outcomes are achieved through the integration of technological support, higher-order thinking development, and motivational reinforcement. Therefore, educators and educational institutions should adopt holistic instructional strategies that combine innovative media use, critical thinking-oriented learning approaches, and motivational enhancement to improve overall learning effectiveness.

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