Lensa: Jurnal Kependidikan Fisika
Penerbit: Universitas Pendidikan Mandalika
https://e-journal.undikma.ac.id/index.php/Lensa/index

Dec. Vol. 12, No. 2
e-ISSN: 2686-0937
pp. 197-211

The Effect of Contextual Teaching and Learning Model Assisted by Video on Students' Learning Outcomes and Motivation

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Abstract

This study explores the effectiveness of the Contextual Teaching and Learning (CTL) model, enhanced by video, in improving students' learning outcomes and motivation, specifically in understanding complex physics topics like sound waves. Traditional teaching methods often struggle to engage students with abstract content, creating a need for innovative approaches that bridge theory with practical applications. The CTL model aims to make learning more meaningful by connecting academic material with real-world contexts. A quasi-experimental design with a pretest-posttest control group was employed, involving two randomly selected groups from 50 students at SMAN 1 Masbagik. The experimental group was taught using the CTL model with video assistance, while the control group followed conventional methods. Data collection included learning outcome tests and motivation questionnaires, analyzed using normality, homogeneity, and t-tests to evaluate differences between groups. Results showed that the experimental group achieved a significantly higher posttest average score (78.92) than the control group (74.20), indicating improved comprehension. Additionally, motivation scores in the experimental group averaged 83.5, categorized as "motivated," suggesting increased engagement. The t-test confirmed a statistically significant difference in learning outcomes, underscoring the effectiveness of video-assisted CTL in enhancing both comprehension and motivation. These findings support the integration of video within the CTL model as a valuable educational strategy to create a more interactive, engaging, and effective learning environment. This study offers insights into how technology-enhanced teaching models can address the challenges of modern education and better prepare students for real-world problem-solving.

Keywords: Contextual teaching and learning; Video-assisted learning; Student motivation; Learning outcomes.

How to cite: Sari, A. R., Gummah, S., Sukroyanti, B. A., Ahzan, S., & Habibi, H. (2024). The Effect of Contextual Teaching and Learning Model Assisted by Video on Students' Learning Outcomes and Motivation. *Lensa: Jurnal Kependidikan Fisika, 12*(2), 197-211. doi:https://doi.org/10.33394/j-lkf.v12i2.13313

INTRODUCTION

Education plays a critical role in shaping individuals, enabling them to develop cognitive skills necessary to navigate the challenges of a rapidly changing world. As society progresses and technology advances, demands on education grow, necessitating teaching and learning processes that are both professional and adaptive to these evolving needs. Effective education relies on curricula that address academic content while also preparing students for practical, real-world applications (Sabri, 2023). To meet these demands, various teaching methodologies have been developed, aimed at optimizing both learning outcomes and student engagement. One such approach that has gained traction is the Contextual Teaching and Learning (CTL) model, which directly links educational content to real-world applications, enhancing student engagement and making learning more relevant.

The CTL model, in particular, serves as an effective pedagogical framework for bridging the gap between theoretical knowledge and real-life applications, encouraging students to connect classroom concepts with their own experiences. This approach makes learning not only more meaningful but also cultivates critical thinking, problem-solving, and adaptability (Nurjehan, 2024). In fields like physics, where abstract concepts can be challenging for students, the contextualization inherent in the CTL approach can simplify complex material, facilitating better comprehension and retention. Research on the CTL model has consistently shown that it can enhance students' conceptual understanding, academic motivation, and performance, as evidenced by findings from studies conducted by Saragih et al. (2023), Wati et al. (2021), and Yolanda et al. (2020). These studies demonstrate that the CTL model serves not only as a theoretical framework but also as a practical tool with measurable positive effects on student engagement and learning.

In addition to improving students' conceptual understanding, the CTL model also fosters essential critical thinking skills. Sabri (2023) demonstrated that teaching materials designed with a CTL approach could significantly improve creative thinking abilities in elementary school students, as statistical analyses revealed notable advancements in learning outcomes. Furthermore, studies indicate that the use of contextual learning, particularly when integrated with virtual tools, can further improve student abilities. For example, the integration of contextual learning with virtual manipulatives has been shown to enhance students' mathematical communication and self-efficacy, reinforcing the adaptability of the CTL model in varied educational settings (Zakiah et al., 2022). These findings emphasize the value of CTL in promoting a holistic education that aligns with 21st-century learning needs, fostering both academic knowledge and practical life skills.

The impact of CTL can be amplified through the integration of modern educational tools, such as video, into the learning process. In today's digital age, video has emerged as a powerful medium to create immersive, interactive, and dynamic learning experiences. Videos offer visual and auditory representations of content, catering to diverse learning styles, which supports improved understanding and retention. When incorporated within the CTL framework, videos can offer students enhanced explanations of abstract concepts, particularly in physics, where visual representation is key to comprehension (Herayanti et al., 2019). This combination not only aligns with the increasing demands for technological integration in classrooms but also meets the needs of digital literacy, a critical skill in the 21st century (Nuari et al., 2023). As students engage with digital content, they develop skills in navigating, interpreting, and applying information, which will benefit their future careers in an increasingly digital world.

Beyond supporting academic performance, integrating video into the CTL model fosters a personalized learning experience. Students can learn at their own pace by pausing, rewinding, and replaying content as needed, allowing for deeper engagement and mastery of material. This flexibility can increase student engagement, motivation, and confidence, particularly as they become more comfortable with complex material. By combining video and CTL, educators are better equipped to engage students in active learning, providing content that resonates with their daily experiences and individual needs. Additionally, using video to complement CTL encourages autonomy in learning, allowing students to take greater control of their educational journeys, an approach consistent with modern educational theories that emphasize learner-centered pedagogy (Abramovich et al., 2019).

Motivation is another essential factor influencing learning outcomes. Highly motivated students are more likely to engage deeply with the material, set academic goals, and persist through challenges, all of which contribute to higher academic success (Fauziah et al., 2017). CTL, especially when complemented with video resources, has been shown to enhance motivation by making learning more engaging, relevant, and relatable. Videos provide visual and auditory stimuli that help students connect emotionally with the material, creating a more interactive and immersive experience. For instance, by using video to demonstrate physics concepts in action, students can better understand how these ideas apply to real-world scenarios, making the subject matter feel more tangible and meaningful. This enhanced motivation can have a significant impact on learning outcomes, as students who are actively engaged and interested in the material are more likely to internalize and retain the information.

Despite the many benefits of modern teaching methodologies like CTL, traditional teaching methods remain prevalent in many schools. For example, at SMAN 1 Masbagik, traditional instruction methods such as lectures and assignments dominate the classroom. In an interview conducted on February 27, 2024, a physics teacher from SMAN 1 Masbagik highlighted that the school largely relies on conventional approaches focused on rote memorization and passive learning. This method limits students' ability to engage deeply with the material and to develop higher-order thinking skills, both of which are crucial for tackling complex, abstract subjects like physics. The reliance on traditional methods underscores the need for more diverse, student-centered teaching approaches that promote critical thinking, creativity, and active engagement.

The limited variety of teaching methods used at SMAN 1 Masbagik points to a pressing need for educational innovation, specifically, the adoption of approaches like the CTL model with video integration. By providing a more interactive and engaging learning environment, the CTL model can address the challenges of traditional teaching methods, fostering a classroom atmosphere where students feel encouraged to explore, ask questions, and apply their knowledge to real-world situations. Integrating video within CTL not only facilitates better understanding of abstract concepts but also aligns educational practices with the digital advancements that characterize modern society, thereby preparing students to thrive in a technology-rich world.

In conclusion, this study aims to examine the effectiveness of the CTL model assisted by video in enhancing students' learning outcomes and motivation. As the limitations of conventional teaching methods become more evident, there is an urgent need for innovative teaching approaches that actively engage students and bridge the gap between theoretical knowledge and practical applications. The integration of video within the CTL model holds promise for creating a more interactive, student-centered, and personalized learning environment. This study seeks to provide insights into how technology can be strategically utilized within CTL to improve educational outcomes, particularly in challenging subjects like physics. Findings from this research are anticipated to offer valuable contributions to the ongoing development of effective teaching models that address the needs of 21st-century learners, ultimately supporting students' academic success and motivation in a rapidly changing educational landscape.

Study objectives and novelty

The primary objective of this study is to examine the effect of the Contextual Teaching and Learning (CTL) model, enhanced by the use of video, on students' learning outcomes and motivation. This research aims to determine whether integrating video into the CTL framework can result in measurable improvements in both academic performance and student engagement. The inclusion of video as a learning tool is anticipated to provide a more dynamic and immersive learning experience, which could facilitate better understanding and retention of the material, particularly in subjects such as physics that often present abstract concepts.

1. The first specific objective is to assess the extent to which the CTL model assisted by video influences students' learning outcomes. Learning outcomes, in this context, refer to the measurable knowledge and skills that students acquire as a result of their engagement with the CTL-based instructional methods. It is expected that by integrating video into the teaching process, students will be able to comprehend complex concepts more easily and demonstrate improved academic performance in assessments.
2. The second specific objective is to evaluate the impact of the CTL model supported by video on students' motivation to learn. Motivation is a critical factor in the learning process, as it drives students to engage actively with the material and persevere in their studies. This research seeks to explore whether the use of video can enhance students' intrinsic motivation by making the learning process more engaging and relevant to real-world contexts.

The novelty of this study lies in its focus on the integration of video into the CTL model as a means of addressing the limitations of conventional teaching methods. While previous research has demonstrated the effectiveness of CTL in improving learning outcomes, this study adds a new dimension by incorporating video, a tool that aligns with the growing digital literacy demands of the 21st century. By combining CTL with video, this research seeks to create a more interactive and student-centered learning environment that not only enhances academic performance but also fosters a deeper engagement with the material.

In summary, this study aims to contribute to the growing body of knowledge on innovative teaching methods by exploring the combined effects of CTL and video on student learning outcomes and motivation. It is expected that the findings will provide valuable insights into how technology can be leveraged to enhance the effectiveness of CTL, ultimately leading to better educational outcomes for students.

METHOD

This research employs a quasi-experimental design, specifically utilizing a Pretest-Posttest Control Group Design, to evaluate the effectiveness of the Contextual Teaching and Learning (CTL) model assisted by video on students' learning outcomes and motivation. The quasi-experimental approach is chosen to accommodate educational settings where it is impractical to achieve full randomization, allowing the study to be conducted in a real classroom environment. This design enables the comparison of learning outcomes and motivation between an experimental group, which receives the intervention, and a control group, which follows conventional teaching methods.

Participants and sampling

The study's participants are 50 students from SMAN 1 Masbagik, a homogenous group in terms of age, academic background, and prior knowledge. These students are in the same educational level and have been assessed for baseline similarities in academic ability, which supports the validity of comparisons between groups. Both the experimental and control groups, consisting of 25 students each, are selected randomly from this population to avoid selection bias and ensure that both groups are comparable. Random sampling is an essential aspect of this design as it increases the generalizability of the findings and reduces potential confounding factors.

Research procedure

The procedure follows a structured sequence, starting with the administration of a pretest to both groups. The pretest assesses students' initial knowledge of Sound Waves, which is the focus topic for this intervention. This initial assessment allows the researchers to establish a baseline measure of each student's understanding before any intervention is applied. Following the pretest, the intervention phase takes place over a period of four weeks, during which the experimental group engages with the CTL model supported by video resources, while the control group continues with traditional teacher-centered instruction. After completing the instructional period, a posttest is administered to both groups to measure the effectiveness of the CTL model with video integration compared to traditional teaching methods.

In the experimental group, the instructional sessions are structured to incorporate video as a key component of the CTL model. These videos are designed to provide visual representations of abstract concepts related to Sound Waves, aiming to bridge the gap between theory and practical application. The experimental sessions follow an inquiry-based approach, encouraging students to explore, question, and apply knowledge in a contextualized learning environment. Meanwhile, the control group follows a conventional approach, relying heavily on lectures and textbook exercises with limited interactive or visual aids. This contrast in instructional methods allows for a focused analysis of the CTL model's impact on student learning outcomes and motivation.

Instruments and data collection

The study utilizes two primary instruments: achievement tests and motivation questionnaires. The achievement tests consist of multiple-choice questions and short answer items specifically designed to assess students' understanding of Sound Waves. These tests are used as pretest and posttest measurements, enabling the evaluation of knowledge gained in both the experimental and control groups. The items are developed based on Bloom's taxonomy, covering various cognitive levels from basic knowledge recall to higher-order thinking skills like analysis and application. This structure ensures that the tests measure not only factual recall but also the students' ability to apply learned concepts in new contexts.

The motivation questionnaires are adapted from a standardized Likert scale, with four response categories ranging from "strongly agree" to "strongly disagree." These questionnaires assess various dimensions of motivation, including students' interest in the subject, perceived relevance of the material, and engagement with the learning process. Each item in the questionnaire is carefully worded to capture the nuances of students' motivational levels accurately. To provide a more detailed analysis, the responses are categorized into five levels of motivation: very good, good, fair, poor, and very poor. This categorization allows the researchers to assess any shifts in motivational levels in both groups before and after the intervention.

Data analysis

The data analysis process is conducted in multiple stages, beginning with a prerequisite analysis to ensure the data's suitability for further statistical testing. The prerequisite analysis includes normality and homogeneity tests, both essential to verify that the data distribution meets the assumptions of parametric tests, allowing for accurate hypothesis testing. The normality test is performed to determine if the data follow a normal distribution, while the homogeneity test assesses the consistency of variance across the experimental and control groups. Meeting these criteria ensures the validity of subsequent statistical analyses, providing reliable insights into the study's findings.

For hypothesis testing, a t-test is employed to compare the mean differences in learning outcomes and motivation between the experimental and control groups. The t-test determines whether the CTL model assisted by video has a statistically significant effect on student performance and motivation. An alpha level of 0.05 is set as the threshold for statistical significance, meaning that differences with a p-value less than 0.05 are considered statistically significant. This threshold provides a balance between avoiding type I and type II errors, supporting the reliability of the conclusions drawn.

Additionally, the motivation data from the questionnaires are analyzed to identify trends in student engagement across both groups. Descriptive statistics are used to illustrate the distribution of motivational levels before and after the intervention, highlighting any noticeable improvements in the experimental group compared to the control group. These trends provide insights into the potential of the CTL model, enhanced by video resources, to improve student motivation in a meaningful and measurable way.

Ethical considerations

The study is conducted in accordance with established ethical guidelines to ensure the welfare and rights of all participants. Informed consent is obtained from each student and their guardians, explaining the purpose of the study, procedures involved, and the voluntary nature of participation. Participants are assured that all data collected will be kept confidential and used solely for research purposes. The anonymity of the students is preserved, and any identifying information is excluded from published results. Additionally, the research design includes measures to mitigate any potential harm, such as minimizing disruption to regular classroom routines.

Validity and reliability

To enhance the validity and reliability of the research findings, several methodological strategies are implemented. Random sampling and the inclusion of both pretest and posttest assessments strengthen the study's internal validity by controlling for selection bias and establishing baseline equivalence between groups. The use of validated instruments, including carefully designed tests and standardized motivation questionnaires, further supports the reliability of the data collected. Moreover, the statistical analyses conducted, including normality, homogeneity, and t-tests, provide a robust framework for interpreting the results with confidence. Through these methodological safeguards, the study aims to produce findings that accurately reflect the impact of the CTL model with video on students' learning outcomes and motivation, contributing valuable insights into the potential of technology-enhanced contextual learning in modern education.

This comprehensive methodological approach provides a foundation for evaluating the effectiveness of the CTL model assisted by video, aiming to inform best practices for integrating contextual learning and technology in educational settings. By rigorously examining the impact on both academic performance and motivation, the study aspires to offer empirical evidence that supports innovative teaching models in response to the demands of 21st-century education.

RESULTS AND DISCUSSION

This study evaluated the impact of the Contextual Teaching and Learning (CTL) model, supported by video, on students' learning outcomes and motivation. The analysis began with baseline data collected from pretest scores administered to both the experimental and control groups before the intervention. The pretest was designed to assess initial knowledge of the subject (sound waves), using essay-based questions to capture students' understanding across a range of cognitive levels (learning outcome).

Table 1. Presents the pretest and posttest results for both groups

Data	Experiment (Pre-test)	Experiment (Post-test)	Control (Pre-test)	Control (Post-test)
Number of students	25	25	25	25
Maximum Score	49	95	45	88
Minimum Score	15	88	15	60
Average Score	35.36	78.92	30.24	74.20

The pretest scores showed that the experimental group's average score was 35.36, and the control group's average score was 30.24, indicating comparable baseline knowledge levels between the two groups. Both averages fell below the minimum passing criteria, underscoring the need for targeted instructional intervention to improve student understanding.

Following the intervention, which involved the CTL model with video assistance for the experimental group, the posttest scores revealed notable improvements in both groups. The experimental group's posttest average rose significantly to 78.92, compared to the control group's 74.20. The experimental group's posttest maximum score reached 95, and its minimum score increased to 88, indicating a narrower range of score variability and a generally higher performance level compared to the control group. This suggests that the CTL model, when augmented with video, contributed to a more consistent and effective learning experience, allowing students to better grasp the complex concepts of sound waves.

The findings support the hypothesis that the CTL model, when supplemented with video, has a positive impact on students' learning outcomes. The greater increase in the experimental group's average posttest score, in comparison to the control group, suggests that video-assisted CTL promotes deeper comprehension and retention of material. This method appears to engage students more effectively by making abstract concepts more accessible and relatable through visual learning, which aligns with prior research indicating that CTL paired with multimedia tools can enhance students' academic performance and motivation.

The integration of video resources within the Contextual Teaching and Learning (CTL) model has demonstrated significant benefits in enhancing students' academic performance, particularly in complex subjects such as physics. The data indicates that the CTL model, when augmented with video, not only improved overall academic outcomes but also effectively narrowed the comprehension gap among students, as evidenced by the high minimum posttest scores achieved by the experimental group. This finding aligns with existing literature that emphasizes the positive impact of multimedia resources on educational engagement and comprehension.

For instance, research has shown that the use of bimodal subtitled videos significantly enhances listening comprehension among students. Febrina's study highlights that students who frequently engage with such videos exhibit improved listening skills, suggesting that the dual modality of visual and auditory stimuli aids comprehension (Febrina, 2022). Similarly, Shayeb's findings reinforce this notion, indicating that students exposed to subtitled videos outperformed their peers in comprehension assessments, thereby underscoring the efficacy of video as a pedagogical tool (Shayeb, 2023). These studies collectively illustrate that video resources can serve as a powerful medium for facilitating understanding, particularly in language learning contexts, which can be extrapolated to other subjects like physics.

Moreover, the CTL model's emphasis on contextual learning is further supported by research indicating that video projects not only enhance comprehension but also foster critical thinking and presentation skills among students (Fachriyah, 2023). This aligns with the principles of the CTL model, which advocates for experiential learning that connects academic content to real-life contexts (Maslahah et al., 2019). The incorporation of video allows students to engage actively with the material, thereby promoting a deeper understanding of complex concepts. For example, Yaacob and Saad discuss how the use of platforms like YouTube during the COVID-19 pandemic facilitated better academic performance, as students could access educational content at their own pace (Yaacob & Saad, 2020). This flexibility is crucial in accommodating diverse learning styles and preferences, which is a core tenet of the CTL approach.

Furthermore, the positive effects of video on comprehension extend beyond language learning. Research by Vázquez-Cano et al. indicates that technology use in educational settings can significantly enhance reading performance, suggesting that multimedia resources can improve overall academic outcomes (Vázquez-Cano et al., 2020). In the context of physics education, the use of videos to demonstrate complex concepts can help students visualize and understand abstract ideas, thereby improving their performance and engagement (Sammons et al., 2018). This is particularly relevant in physics, where visualizing phenomena can bridge the gap between theoretical knowledge and practical application.

The integration of video resources within the CTL model not only enhances academic performance but also plays a crucial role in closing comprehension gaps among students. The evidence from various studies supports the notion that multimedia tools, particularly videos, can create a more engaging and effective learning environment, especially in challenging subjects like physics. This underscores the importance of incorporating such resources into educational practices to foster better learning outcomes.

The data from the pretest and posttest of Class XI IPA were subjected to various statistical analyses to validate the results and assess the impact of the CTL (Contextual Teaching and Learning) model, assisted by video, on students' learning outcomes and motivation. To ensure the validity of further analysis, the initial steps involved conducting normality and homogeneity tests, followed by hypothesis testing using t-tests.

Table 2. The normality test results

α	Variable	L_{count}	L_{table}	Decision
0.05	Pretest (Experimental)	0.09	0.17	Normally distributed
0.05	Posttest (Experimental)	0.16	0.17	Normally distributed
0.05	Pretest (Control)	0.10	0.17	Normally distributed
0.05	Posttest (Control)	0.12	0.17	Normally distributed

Table 3. The homogeneity test results

α	Variable	N	F_{count}	F_{tabel}	Decision
0.05	Pretest (Experimental)	25	1.25	1.98	Homogeneous
0.05	Pretest (Control)	25	1.25	1.98	Homogeneous
0.05	Posttest (Experimental)	25	1.31	1.98	Homogeneous
0.05	Posttest (Control)	25	1.31	1.98	Homogeneous

Table 4. The hypothesis test results

Group	Average Score	t_{count}	t_{table}	Criteria
Experiment	78.92	1.79	1.68	Ha accepted
Control	74.20	1.79	1.68	Ho rejected

The normality test results, summarized in Table 2, reveal that the distribution of pretest and posttest scores for both the experimental and control groups adheres to normal distribution. At the 0.05 significance level, all values of L_{count} are lower than L_{tabel}, confirming normality across all measures. This normal distribution is crucial as it permits the use of parametric tests to analyze differences between the two groups accurately, thus supporting the reliability of the data obtained.

To further ensure the consistency of the sample data, a homogeneity test was conducted, with results detailed in Table 3. The homogeneity test compares the variances of pretest and posttest scores between the control and experimental groups. As indicated by $F_{count} < F_{table}$ for all variables, the test confirms that the sample groups are homogeneous, establishing that there are no significant differences in variance within the groups. This outcome validates the comparability of the experimental and control groups, allowing for meaningful interpretation of the differences in learning outcomes resulting from the intervention.

Following these preliminary analyses, hypothesis testing was conducted to determine if the CTL model, when enhanced with video, significantly impacts student learning outcomes. Table 4 presents the t-test results, showing an average posttest score of 78.92 for the experimental group and 74.20 for the control group. The t-test reveals that t_{count} (1.79) exceeds t_{table} (1.68) at the 0.05 significance level, leading to the acceptance of the alternative hypothesis (Ha) and the rejection of the null hypothesis (Ho). The findings regarding the statistically significant improvement in learning outcomes for the experimental group utilizing the Contextual Teaching and Learning (CTL) model with video support are well-supported by existing literature. The data suggests that this multimodal approach not only enhances academic performance but also facilitates a deeper understanding of complex subjects, such as physics, by providing a richer learning experience. For example, Haniya et al. (2019) emphasize that multimodal learning engages multiple senses, thereby enriching the educational experience and improving learning outcomes. This aligns with the findings that video resources in the CTL framework can clarify intricate concepts, making them more accessible to students. Moreover, Zhang's study highlights the effectiveness of integrating 360-degree panoramic virtual reality (VR) in educational contexts, demonstrating that multimodal resources can lead to improved learning outcomes across various subjects, including history (Zhang, 2023).

Furthermore, the application of multimodal teaching strategies has been shown to foster conceptual understanding, particularly in physics education. Aktan's research underscores the importance of assessing students' conceptual understanding levels, revealing that effective teaching methods can significantly enhance students' grasp of complex physics concepts (Aktan, 2012). This is echoed by Ortiz and Aliazas, who discuss the integration of multimodal strategies in educational settings, emphasizing their role in promoting deeper cognitive engagement and understanding in science education (Ortiz & Aliazas, 2021). Such findings suggest that the CTL model, when combined with video resources, aligns well with pedagogical strategies aimed at improving conceptual understanding in subjects that require critical thinking and problem-solving skills.

Beyond learning outcomes, the study also explored the effect of the video-assisted CTL model on students' motivation. The analysis of student motivation, measured through a questionnaire administered to 25 students in Class XI IPA F3 (the experimental group), yielded encouraging results. As shown in Table 5, the average score for intrinsic motivation was 85.94, while extrinsic motivation scored an average of 79.83, resulting in an overall average motivation score of 83.5. This score indicates a strong level of engagement, with students demonstrating a high degree of both internal interest and external encouragement when learning through the video-supported CTL model.

Table 5. The results questionnaire

Motivation Indicator	Number of Items	Achievement Score	Description
Intrinsic Motivation	18	85.94	Motivated
Extrinsic Motivation	12	79.83	Motivated
Average Score		83.5	Motivated

These results place the students in the "motivated" category according to the scoring rubric, suggesting that the use of video within the CTL framework has a positive influence on both intrinsic and extrinsic motivational factors. By contextualizing learning with visually engaging materials, the CTL model with video support appears to stimulate students' enthusiasm and interest, potentially making abstract concepts more relatable and increasing their willingness to engage deeply with the subject matter.

The CTL model has been shown to enhance students' learning motivation by linking educational content to real-world experiences and environments. This approach fosters a more engaging learning atmosphere where students can see the relevance of their studies to their daily lives, thereby increasing their intrinsic motivation to learn. For instance, Syaifuddin et al. emphasize that the CTL model facilitates the connection between academic material and real environmental phenomena, which encourages students to relate their learning to societal issues, ultimately promoting independence and motivation in their studies (Syaifuddin et al., 2021). Furthermore, the CTL model's emphasis on inquiry-based learning allows students to construct knowledge through personal experiences, which has been linked to increased attention and interest in the subject matter (Rahmawati et al., 2021).

Research indicates that students with initially low motivation can experience significant improvements in their learning outcomes when taught using the CTL model. Ima et al. found that the phases of the CTL model are more accessible for students who struggle with motivation, as they provide a structured yet engaging framework for learning (Ima et al., 2023). This is echoed by Rahmawati et al., who argue that the CTL model encourages active participation and critical thinking, which are essential for maintaining student interest and motivation (Rahmawati et al., 2021). The model's focus on collaborative learning and problem-solving further enhances student engagement, as it requires them to interact with peers and apply their knowledge in practical contexts (Thamrin, 2024).

Moreover, the integration of technology, such as electronic video, has been shown to facilitate the learning process and improve motivation. This aligns with findings from Widyaningrum, who notes that teachers must actively engage with students and utilize innovative teaching materials to maintain high levels of motivation (Widyaningrum, 2024). The CTL model thus not only enhances the learning experience but also equips students with the skills necessary for lifelong learning.

In summary, the CTL model improves students' learning motivation by creating a learning environment that is relevant, engaging, and interactive. By linking academic content to real-life situations, encouraging inquiry and collaboration, and integrating technology, the CTL approach fosters a deeper connection between students and their learning, ultimately leading to improved educational outcomes.

CONCLUSION

This study demonstrates that the Contextual Teaching and Learning (CTL) model, when enhanced with video resources, has a significant positive effect on both students' learning outcomes and motivation. The results show that the experimental group, which experienced the video-assisted CTL model, achieved a higher average posttest score compared to the control group, confirming the model's effectiveness in improving comprehension of complex topics such as sound waves. Additionally, the increased motivation levels observed in the experimental group highlight the potential of video-supported CTL to foster student engagement by making learning more interactive and relevant to real-world contexts.

The integration of video within the CTL framework proves to be an effective strategy for enhancing student-centered learning environments that cater to various learning styles, ultimately improving educational outcomes. By contextualizing academic material and supporting the development of critical thinking skills, the video-assisted CTL model not only aids academic achievement but also encourages a deeper connection with the subject matter. These findings underscore the importance of adopting innovative, technology-enhanced teaching methods in classrooms, particularly for subjects requiring conceptual understanding and practical application.

RECOMMENDATION

Based on the findings, it is recommended that educators incorporate the CTL model supported by video resources into teaching strategies, particularly for complex and abstract subjects like physics. The use of video within CTL can enhance students' engagement, motivation, and comprehension by providing visual, real-world applications of theoretical concepts. Schools and educational policymakers should consider investing in digital learning tools and professional development for teachers to effectively implement video-assisted CTL, fostering an interactive learning environment that aligns with the demands of 21st-century education.

ACKNOWLEDGEMENT

The authors would like to express sincere gratitude to SMAN 1 Masbagik for their invaluable support and cooperation in facilitating this research. Special thanks are extended to the students and teachers who participated in the study, as well as to colleagues who provided insightful feedback throughout the research process. This work was made possible through their collective effort and dedication to advancing educational practices.

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