

The Effectiveness Of Using Interactive Video-Based Media To Improve Motivation In Chemistry Learning: A Literature Review

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ABSTRACT

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Electronic learning media can be used for learning purposes, and one form of this media is interactive videos. Using interactive video-based learning media is expected to help improve students' motivation, especially for subjects considered difficult, such as chemistry, which has abstract concepts and a monotonous learning process. The purpose of this research is to find out the effectiveness of interactive video-based learning media in improving motivation in chemistry. The method used in preparing this academic work is the Systematic Literature Review method and the PRISMA method, which focuses on collecting data from literature sources by searching for relevant theoretical references related to improving students' motivation in chemistry using interactive videos. In data analysis, the researcher uses content analysis technique. This technique involves the process of categorizing and analyzing relevant information. Using interactive video-based learning media not only serves as a learning aid in the learning process but also becomes an effective learning resource that can improve students' motivation, especially in the subject of chemistry. The advantages of interactive videos include being engaging, having diverse content, providing interactivity that helps students develop learning skills, and offering wide access to learning materials, which can help overcome students' difficulties in microscopic or complex chemical phenomena.

INTRODUCTION

Current technology continues to evolve and impact the educational process by encouraging more participatory and interactive learning and utilizing existing technology (Fadzillah & Syaadah, 2025). There are three ways in which technology influences curriculum development and its role in the learning process: (1) new technology is used for synchronous social purposes; (2) technology offers resources for curriculum development, enabling teachers to find and collect open materials and assist students in their learning; and (3) technology can offer tools to evaluate various practical fields, such as simulations, which produce models or visualization tools in science and tools for analyzing manuscripts (Chan, 2024). Technology is used as a cutting-edge teaching tool that is considered capable of adapting to changing circumstances. One factor that influences the achievement of learning objectives is media or learning aids. Audio, video, print media, projections, films, video games, and others can all be considered forms of media (Tran-Duong, 2023).

Learning media are supporting facilities in the processes of teaching and learning. Based on the direct learning approach, which involves teachers as sources of information, learning media are a means of communicating learning messages. In this case, instructors

need to use a variety of appropriate media (Kandia, 2023). Utilizing the right learning media can increase engagement throughout the educational experience, preventing students from becoming disinterested. In addition, students appreciate media in learning because it increases the effectiveness of their educational outcomes. Utilizing the right learning media during the educational process will produce positive results (Jauza & Albina, 2025).

Numerous educational tools can be utilized during the learning experience. However, schools still use printed learning materials in the form of books and workbooks. Printed learning materials can make abstract chemistry concepts difficult for students to understand without visuals and explanations from teachers. Low student achievement in chemistry can be caused by factors related to student motivation, because motivation greatly affects learning outcomes (Putri et al., 2022).

Advances in media in chemistry education are essential to enhance the learning experience. Teachers must be able to select the appropriate media for teaching chemistry. Many academics have created resources for chemistry education. This development trend embraces 21st-century learning styles. The use of 21st-century learning styles is evident in the creation of Android-based educational media (Rahmi et al., 2022). Video-based learning is widely used, as evidenced by the strong relationship between media, ease of use, and knowledge, which produces impressive results. Interactive learning videos utilize modern technology to meet the educational needs of millennial students. Most students bring laptops or smartphones to school. This is a method that teachers can use to leverage technology to improve its application in the educational experience (Widayanti, 2023).

The application of interactive media through interactive videos is one solution that can address students' needs in chemistry learning. Motivation plays a crucial role in the learning process, as it influences students' engagement, persistence, and achievement in understanding chemistry, which is often perceived as a challenging subject. A lack of motivation can lead to low participation and poor conceptual understanding, making it essential to explore how appropriate learning media can stimulate students' interest and drive in learning. Therefore, this study analyzes the effectiveness of interactive learning media in increasing student motivation in chemistry learning.

RESEARCH METHOD

This research was conducted using Systematic Literature Review with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) method on studies that discuss the effectiveness of media in the form of interactive videos on increasing student motivation. The nature of this research is descriptive analysis, which includes details of the data obtained in an organized manner, followed by interpretation and explanation so that readers can understand it. The instruments in this research are secondary data in the form of studies (journals) sourced from the SINTA database, ResearchGate, and Google Scholar using keywords such as *learning media*, *interactive videos*, *chemistry*, and *motivation*. The selected articles met several inclusion criteria: (1) published between 2021 and 2025, (2) indexed in SINTA 1 or SINTA 2, (3) focused on the use of interactive or video-based media in chemistry learning, and (4) presented

measurable outcomes related to student motivation or engagement. Based on these criteria, six journal articles indexed in SINTA 1 and SINTA 2 were selected and analyzed in this study. The data analysis of the review of scientific journal articles was carried out using the analysis and exposition method described with several points for more explanation. Such as, journal publisher, title, author name, methodology, results and discussion, and conclusions from each journal reviewed, in the form of a table.

RESULTS AND DISCUSSION

The results and discussion of this research are organized in several sections based on the journals studied as below.

Table 1. Indexed Journal Publication in Indonesia

Year	Article Title	Journal Name	Type of Publications
2021	Implementation of The Video Project With Distance Learning on Basic Chemistry Course	JKPK (Journal of Chemistry and Chemistry Education)	Sinta 2
2024	Animation videos to enhance senior high school students' motivation in learning chemistry: A learning medium in inclusive schools	Indonesian Journal of Science and Mathematics Education	Sinta 2
2024	A Powtoon Animation Video Development Utilizing a Scientific Approach for Teaching Electrolyte and Non-electrolyte Solutions	Jurnal Penelitian Pendidikan IPA	Sinta 2
2025	Effectiveness of Interactive Learning Videos Based on Problem-Based Learning to Increase Student Motivation and Critical Thinking Skills	Unnes Science Education Journal	Sinta 2
2025	Development of YouTube-Based Electrolysis Learning Media to Increase Student Learning Motivation	Jurnal Penelitian Pendidikan IPA	Sinta 2
2025	Development of Animated Videos on Basic Chemistry Laws as Digital Learning Media	Jurnal Penelitian Pendidikan IPA	Sinta 2

Based on Table 1, there are six articles published in reputable national journals indexed in SINTA 1 and SINTA 2 during the 2021–2025 period. These articles mainly focus on the development and implementation of interactive and animation-based video learning media, such as video projects, Powtoon animations, YouTube-based media, and problem-based learning videos. This indicates a consistent research trend over the past five years, emphasizing the use of interactive digital media as an innovative approach to improve the quality of chemistry learning, particularly in enhancing students' learning motivation.

Table 2. The Result of Literature Analysis of Articles on the Effectiveness of Interactive Video Media

Researcher	Research Method	Research Findings
(Setiowati et al., 2021)	Survey method	Based on the assessment results, a mean score of 3.65 or 73% was obtained. However, the results of the motivation score are the lowest compared to other indicators such as responsibility and independence.
(Ayudia & Kamaludin, 2024)	Research and Development (RnD)	Based on the assessment results, this inclusive learning animation video received an excellent rating of 97.57% from material experts, 93.75% from media experts, 96.22% from reviewers, and 94.6% from student answers in the excellent category. This, the inclusive learning animation video produced can increase student learning motivation and is suitable for use as an alternative learning media in the classroom.
(Eljinsa & Zamhari, 2024)	Research and Development (RnD)	This item obtained ratings of 82.5% and 95% from specialists in materials and media, resulting in it being labeled as legitimate. Evaluations conducted by teachers and learners produced scores of 82.5% and 94.4%, placing them in the outstanding category. This Powtoon animated video serves as a viable and promising resource for instructing chemistry on this subject within the classroom.
(Ulfaa et al., 2025)	Quantitative research	The validation results show that video is very suitable for curriculum standards, has an attractive design, and uses communicative language, with an average validity percentage reaching 93%.
(Putri & Widarti, 2025)	Research and Development (RnD)	Learning media development products produced in the form of YouTube social media account with the name "YuroLab" which contains 3 learning video content. Learning video content themed culture or ethnoscience with podcast content and practicum tutorials with small-scale laboratories. The average results of the validation test and readability test respectively obtained a score of 83.89 and 81.99% which is included in the category very feasible.
(Yuninnur & Mukhlishin, 2025)	Research and Development (RnD)	The validation results show that the media has a very high level of validity in terms of material (89.16%), media (87.18%), and language (96.96%). Practicality tests conducted by teachers (91.78%) and students, both small scale (86.80%), and large scale (92.6%), also showed a very practical category. Thus, the animated video was declared

valid and practically feasible to be used as digital learning media to improve students' understanding of the basic laws of chemistry at Taman Mulia Kubu Raya High School.

From the initial search process, a total of 28 journal articles related to the use of interactive or video-based media in chemistry learning were identified through the SINTA database, ResearchGate, and Google Scholar. These articles were then screened and selected based on predetermined criteria, such as publication year (2021–2025), relevance to chemistry learning, focus on motivation enhancement, and indexation in SINTA 1 or SINTA 2. After the screening process, six articles that met all the criteria were selected for in-depth analysis. These selected studies are summarized in Table 1, which presents information about the year, title, journal name, and type of publication.

Based on Table 2 explains the results of the literature analysis of the six articles. Research by Setiowati et al. (2021) used a survey method and resulted in a motivation score of 73%, which is classified as a high category, although it is still lower than other indicators such as responsibility and independence. Ayudia & Kamaludin's research (2024) using the RnD method showed excellent results, with validation scores from various parties being above 90% and student responses reaching 94.6%, confirming that inclusive animated videos can be an effective alternative media in increasing motivation. Eljinsa & Zamhari (2024) also developed Powtoon-based animated media and obtained high validation scores from experts and students, which were between 82.5% and 94.4%. Research by Ulfaa et al. (2025) emphasized the feasibility of PBL-based learning videos with an average validation reaching 93%. Furthermore, Putri & Widarti (2025) produced YouTube-based media that obtained a feasibility score of 83.89% and readability of 81.99%, so it was categorized as very feasible, although the score was lower than other studies. Finally, Yuninnur & Mukhlisin (2025) developed an animated video of the basic laws of chemistry with high validation results (87-97%) and a practicality test that also showed a score above 90%, proving that the media is feasible to use in learning.

The data presented in Table 1 and Table 2 can be further illustrated in the diagram, which provides a visual comparison of the motivational outcomes across the six reviewed articles.

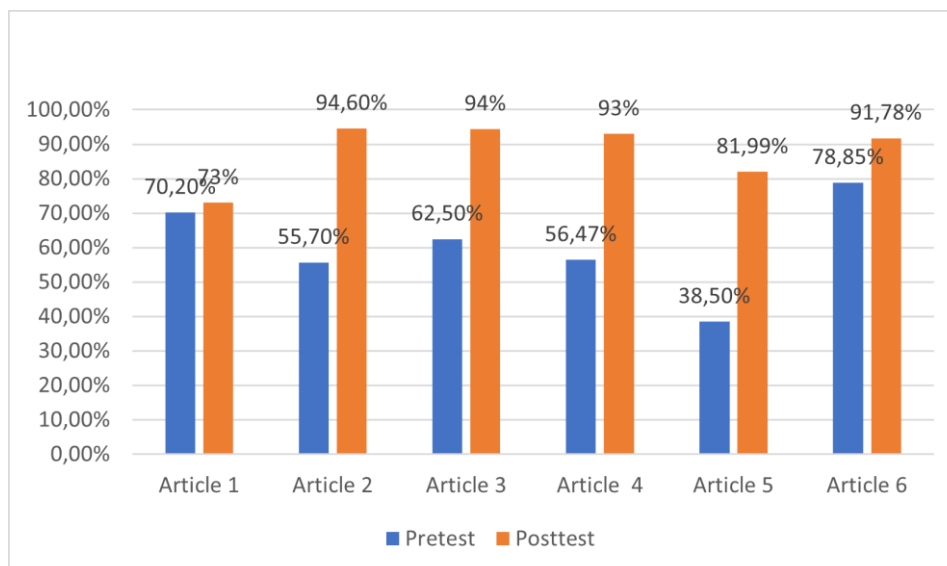


Figure 1. Comparative results of motivation scores across six research studies on interactive video-based learning

When viewed from the results of the comparison bar chart of the six articles, it can be seen that most studies produce a high percentage of learning motivation, which is above 90%. The article with the highest score was Ayudia & Kamaludin (2024) with 94.6% who developed inclusive animation media, while the lowest score came from the research of Setiowati et al. (2021) with 73%. This difference indicates that interactive and inclusive animation-based media tend to be more effective in increasing learning motivation than conventional video projects. In addition, media based on popular platforms such as YouTube (Putri & Widarti, 2025) did provide positive results (83.89%), but it was not as strong as animated media based on scientific approaches or PBL, whose effectiveness reached more than 90%.

CONCLUSION

Based on the analysis of six articles, It can be determined that interactive video is proven effective in improve chemistry motivation to learn chemistry. This media is considered valid and practical by both experts and users with scores (above 80%). In addition to increasing motivation, interactive video media also encourages other skills such as critical thinking, collaboration, digital literacy, and understanding of microscopic or complex chemical phenomena. Innovations in the form of animation, ethnoscience integration, and the application of PBL models make interactive video media not only a means of delivering material, but also as a strategic tool to create more meaningful, interesting, and contextualized chemistry learning.

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