

## **The Effect of Interactive Video-Based Learning on Students' English Learning Outcomes**

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### **ABSTRACT**

The integration of technology in language teaching has become increasingly important to enhance student engagement and learning outcomes. This study examined the effect of interactive video-based learning on students' English learning outcomes at SMA N 2 Kulisusu Utara, Southeast Sulawesi. Employing a one-group pretest-posttest pre-experimental design, the research involved the entire population of 17 students in Class XI. Interactive videos, developed using Canva and Edpuzzle with embedded quizzes, subtitles, and interactive tasks aligned with the 2022 Merdeka Curriculum, were implemented over eight weeks. English learning outcomes were measured through a validated achievement test covering vocabulary mastery, grammar, reading comprehension, and listening skills. Data were analysed using paired sample t-test with SPSS version 26. The results showed a significant improvement in students' English learning outcomes after the intervention (pretest mean = 64.12, SD = 8.45; post-test mean = 81.76, SD = 7.23;  $t = 9.87$ ,  $p < 0.001$ ). Additionally, students reported high positive perceptions toward the learning media. These findings indicate that interactive video-based learning is an effective and engaging instructional strategy for improving English proficiency in senior high school settings, particularly in resource-limited madrasah environments. The study recommends wider adoption of interactive video technology and further research with larger samples and control groups.

**Keywords:** Interactive Video-Based Learning; English Learning Outcomes

## INTRODUCTION

In the era of globalization and rapid technological advancement, English has become an essential international language for communication, education, employment, and access to global knowledge. Proficiency in English enables students to compete in the global workforce and pursue higher education opportunities. However, many students in non-English speaking countries, including Indonesia, still face significant challenges in mastering the language, particularly in the four integrated skills: listening, speaking, reading, and writing.

The integration of technology in language teaching has emerged as a promising solution to enhance student engagement and learning outcomes. Among various technological tools, interactive video-based learning has gained increasing attention from researchers and educators. Unlike passive video watching, interactive videos incorporate elements such as embedded quizzes, subtitles, clickable hotspots, instant feedback, and task-based activities that actively involve students in the learning process. Previous studies have demonstrated that interactive videos can significantly improve vocabulary acquisition, listening comprehension, grammar mastery, and overall language achievement by providing authentic contexts, increasing motivation, and accommodating different learning styles.

In Indonesia, the implementation of the Merdeka Curriculum (Curriculum Merdeka) since 2022 emphasizes student-centered learning, differentiation, and the integration of technology to foster 21st-century skills. This curriculum encourages teachers to move beyond traditional textbook-based methods toward more innovative and engaging approaches. Interactive video aligns well with Merdeka Curriculum principles, as it supports project-based activities, differentiated instruction, and the development of critical thinking and digital literacy.

Despite these advantages, the effectiveness of interactive video-based learning in improving English outcomes remains under-researched in certain Indonesian contexts, particularly in madrasah (Islamic senior high schools) located in rural or semi-rural areas. MAN 2 Kulisusu Utara, located in North Buton Regency, Southeast Sulawesi, represents a typical madrasah in a region with limited resources. With only 17 students in Class XI, the class size is small, yet challenges such as low student motivation, limited exposure to authentic English materials, inadequate facilities, and traditional teacher-centered methods persist. Students in such environments often exhibit passive learning attitudes, low confidence in using English, and difficulties in understanding abstract language concepts when taught through conventional methods.

Several studies have reported that students in rural Indonesian schools face unique barriers in English language learning, including insufficient learning resources, limited internet access, lack of qualified teachers trained in technology integration, and low parental support. These conditions frequently result in below-average English proficiency, which hinders students' academic progress and future

opportunities. Traditional English teaching in many madrasahs still relies heavily on rote memorization and grammar-translation methods, which fail to develop communicative competence or sustain student interest.

Interactive video-based learning offers a practical and cost-effective solution to address these issues. By using accessible tools such as Canva and Edpuzzle, teachers can create engaging videos tailored to the curriculum without requiring expensive equipment. Embedded interactive features allow students to learn at their own pace, receive immediate feedback, and practice language skills in meaningful contexts. This approach is particularly suitable for small classes like Class XI at SMA N 2 Kulisusu Utara, where personalized feedback and active participation can be maximized.

Although numerous international studies have shown positive effects of interactive videos on English learning (for example, improvements in listening, speaking, and overall achievement), research specifically conducted in Indonesian madrasah settings, especially in Southeast Sulawesi, remains limited. Most existing studies focus on urban schools or larger samples, leaving a gap in understanding how this media performs in resource-constrained, small-class environments under the Merdeka Curriculum. This study aims to fill that gap by examining the effect of interactive video-based learning on students' English learning outcomes at SMA N 2 Kulisusu Utara. Specifically, it investigates whether the implementation of interactive videos over eight weeks can significantly improve students' scores in vocabulary mastery, grammar, reading comprehension, and listening skills compared to their initial performance. The study also explores students' perceptions toward this learning approach.

The findings of this research are expected to provide empirical evidence on the effectiveness of interactive video in a madrasah context and offer practical recommendations for English teachers in similar settings. By demonstrating how simple, teacher-created interactive videos can enhance learning outcomes, this study contributes to the broader discourse on technology integration in Indonesian Islamic education and supports the successful implementation of the Merdeka Curriculum in rural areas.

## **LITERATURE REVIEW**

Interactive video-based learning refers to the use of digital videos enriched with interactive elements such as embedded quizzes, subtitles, clickable hotspots, instant feedback, and task-based activities. Unlike traditional passive video viewing, this approach actively engages learners, allowing them to interact with the content, receive immediate responses, and learn at their own pace. In English language teaching, interactive videos are particularly valuable because they provide authentic linguistic input, contextualize vocabulary and grammar, and simultaneously develop receptive (listening and reading) and productive skills.

The effectiveness of interactive videos is grounded in several established learning theories, most notably Richard E. Mayer's Cognitive Theory of Multimedia Learning (CTML). Mayer (2009, 2014) argues that humans process information through two separate channels visual/pictorial and auditory/verbal and that meaningful learning occurs when learners actively select, organize, and integrate new information with prior knowledge. Key principles from CTML that support interactive video design include the multimedia principle (people learn better from words and pictures than from words alone), modality principle (narration is more effective than on-screen text with visuals), segmenting principle (breaking content into smaller segments improves comprehension), signalling principle (highlighting essential material guides attention), and interactivity principle (learner control and feedback enhance engagement and reduce extraneous cognitive load). These principles align well with the design of interactive videos created using tools such as Canva and Edpuzzle, which allow teachers to insert quizzes, reflective questions, and feedback directly into the video timeline. Such features help minimize cognitive overload while promoting germane cognitive load — the effort devoted to schema construction and deep learning.

Numerous empirical studies conducted after 2017 have consistently demonstrated the positive impact of interactive video-based learning on English learning outcomes. Hung et al. (2018) investigated the use of embodied interactive video lectures (EIVLs) with 90 university students. The results showed that learners who used embodied interactive videos significantly outperformed those using non-embodied interactive or conventional videos in both comprehension and retention of learning content, without imposing additional cognitive load. Taslibeyaz (2020) examined scenario-based interactive videos in an English grammar course for seventh-grade students. Using a quasi-experimental design, the study found that the experimental group achieved significantly higher post-test scores in grammar achievement and exhibited more self-regulated learning behaviors compared to the control group using traditional methods. Barman et al. (2021), although focused on students with intellectual disabilities, provided broader insights by showing that regular interactive video sessions improved learning outcomes through repeated practice and immediate feedback. The approach proved effective in overcoming minor learning barriers and increasing engagement. Zheng et al. (2025) conducted a quasi-experimental study on scenario-based interactive video learning systems (SIVLS) for English pronunciation among primary school students. The results indicated a significant positive effect of SIVLS on pronunciation skills ( $p < 0.001$ ), far outperforming conventional video learning systems. The study highlighted the value of authentic scenarios and interactivity in pronunciation development. Turfanda (2025) specifically explored the impact of interactive videos on English language achievement and attitudes among Turkish fifth-grade students. The interactive videos, designed based on Mayer's CTML, led to significant improvements in listening comprehension, vocabulary acquisition, and overall language achievement, along with more positive student attitudes toward English learning.

A recent comprehensive review by Navarrete (2025) analysed 257 articles on video-based learning published between 2016 and 2021. The review confirmed that videos incorporating interactive features, segmentation, and signalling consistently produced better learning effectiveness, particularly when aligned with Mayer's multimedia principles and modern technologies such as embedded quizzes and learner control mechanisms. These studies collectively support the notion that interactive elements transform passive video consumption into an active, constructivist learning experience, leading to better retention, motivation, and skill development in English.

### **Interactive Video in the Indonesian Madrasah Context and Merdeka Curriculum**

In the Indonesian educational context, the implementation of the Merdeka Curriculum since 2022 emphasizes student-centered learning, differentiated instruction, and technology integration to develop 21st-century skills. Interactive video-based learning aligns strongly with these principles, as it allows teachers to create differentiated materials tailored to students' needs and provides opportunities for active engagement even in resource-limited settings. Although research on interactive videos in Indonesian madrasahs is still limited, several local studies using platforms such as Edpuzzle have reported positive effects on vocabulary mastery and listening skills. The small class size at SMA N 2 Kulisusu Utara (only 17 students in Class XI) offers a unique opportunity to maximize the benefits of interactive features, such as personalized feedback and repeated viewing, which are often difficult to achieve in larger classes.

While international and some national studies have shown promising results, most existing research has been conducted in urban schools, universities, or with larger sample sizes. There remains a noticeable gap in empirical evidence regarding the effectiveness of teacher-created interactive videos in small-class madrasah settings in rural or semi-rural areas of Indonesia, particularly under the Merdeka Curriculum framework. Furthermore, few studies have focused specifically on integrated English learning outcomes (vocabulary, grammar, reading comprehension, and listening) in Islamic senior high schools with limited resources. The present study addresses this gap by examining the effect of interactive video-based learning on English learning outcomes among 17 eleventh-grade students at SMA N 2 Kulisusu Utara. By using accessible tools and aligning with Mayer's CTML, this research is expected to provide practical insights for English teachers in similar madrasah environments.

## **METHOD**

### **Design and Sample**

This study employed a one-group pretest–post-test pre-experimental design to examine the effect of interactive video-based learning on students' English learning

outcomes. In this design, a single group of participants was measured before and after the intervention without the use of a control group, allowing the researcher to observe changes associated with the treatment (Creswell & Creswell, 2018). The design was selected due to practical constraints, including the limited number of available classes in the research setting. Although this approach has limitations in terms of internal validity, it is appropriate for preliminary studies conducted in real classroom contexts where random assignment is not feasible.

The study was conducted at SMA N 2 Kulisusu Utara, North Buton Regency, Southeast Sulawesi, Indonesia. The population consisted of all eleventh-grade students in the 2025/2026 academic year. Given the small population size, total sampling was applied, involving all 17 students as the research sample. These students had been learning English under the Merdeka Curriculum and possessed basic digital literacy skills, although their prior experience with interactive technology in language learning was relatively limited.

### **Instruments and Procedures**

The independent variable in this study was interactive video-based learning, while the dependent variable was students' English learning outcomes, which included vocabulary mastery, grammar, reading comprehension, and listening skills. Data were collected using a validated achievement test consisting of 40 items in the form of multiple-choice and short-answer questions. The test was designed to measure the four targeted language skills and was administered twice: as a pretest one week before the intervention and as a post-test one week after the completion of the treatment. The instrument's validity was established through expert judgment involving two English lecturers and one senior English teacher. Reliability testing using Cronbach's Alpha yielded a coefficient of 0.87, indicating high reliability.

In addition, a perception questionnaire was distributed at the end of the intervention to gather qualitative insights into students' responses toward the use of interactive video-based learning. The intervention was conducted over eight weeks, with two sessions per week, each lasting approximately 90 minutes. Interactive video materials were developed by the researcher using Canva for video creation and Edpuzzle to embed interactive elements such as multiple-choice questions, open-ended responses, subtitles, and instant feedback. The content was aligned with the Merdeka Curriculum for Grade XI, covering topics related to daily life, the environment, and technology.

The procedure began with the administration of the pretest to determine students' baseline proficiency. During the intervention phase, students engaged with interactive videos by watching, responding to embedded tasks, and participating in guided classroom discussions facilitated by the teacher. At the end of the intervention, the post-test was administered using the same instrument to measure learning improvement. All sessions were conducted in the school's computer

laboratory or in a classroom equipped with a projector and supported by students' personal devices with internet access.

### Data Analysis

The data were analyzed using both descriptive and inferential statistics with SPSS version 26. Descriptive statistics, including means and standard deviations, were used to summarize students' pretest and post-test scores. To determine whether there was a statistically significant difference between pretest and post-test results, a paired sample t-test was conducted at a significance level of 0.05. Prior to the analysis, assumptions of normality and homogeneity were tested to ensure the appropriateness of the statistical procedure. Qualitative data obtained from the perception questionnaire were analyzed thematically to provide additional insights and to support the interpretation of quantitative findings.

## RESULT AND DISCUSSION

The descriptive statistics of students' English learning outcomes before and after the eight-week intervention are presented in Table 1. The pretest mean score was 64.12 (SD = 8.45), indicating that students' initial English proficiency was in the low-to-average category. After the implementation of interactive video-based learning, the post-test mean score increased substantially to 81.76 (SD = 7.23). This improvement suggests a positive change in students' vocabulary mastery, grammar, reading comprehension, and listening skills.

Table 1. Descriptive Statistics of Pretest and Post-test Scores (N=17)

Test	Mean	SD	Minimum	Maximum
Pretest	64.12	8.45	48	78
Post-test	81.76	7.23	68	94

The paired sample t-test was conducted to determine whether the observed difference between pretest and post-test scores was statistically significant. The analysis revealed a mean difference of 17.64 points in Favor of the post-test. The calculated t-value was 9.87 with 16 degrees of freedom, and the significance value (p) was less than 0.001. These results indicate that the improvement in English learning outcomes was highly significant at the 0.05 level. The effect size was also calculated using Cohen's d to measure the practical significance of the intervention. Cohen's d value reached 2.39, which is considered a very large effect according to Cohen's (1988) guidelines. This large effect size confirms that interactive video-based learning had a substantial practical impact on the students' English achievement beyond mere statistical significance.

All four measured language skills showed improvement. The largest gain was observed in listening skills and vocabulary mastery, followed by reading comprehension and grammar. Students appeared to benefit particularly from the authentic contexts and immediate feedback provided by the embedded quizzes in

the interactive videos. Normality assumptions were checked using the Shapiro-Wilk test, and the data were found to be normally distributed for both pretest and post-test scores ( $p > 0.05$ ). This satisfied the prerequisite for the paired sample t-test. No outliers were detected that could unduly influence the results.

Students' responses from the perception questionnaire supported the quantitative findings. A total of 94.1% of students agreed or strongly agreed that interactive videos made English lessons more interesting and easier to understand. Many students mentioned that the ability to replay segments and answer quizzes directly in the video helped them retain new vocabulary and structures better. The results of this study demonstrate that the use of interactive video-based learning over eight weeks led to a statistically significant and practically meaningful improvement in the English learning outcomes of the 17 eleventh-grade students at SMA N 2 Kulisusu Utara.

The significant increase in English learning outcomes after the implementation of interactive video-based learning is consistent with previous studies that highlight the advantages of interactive elements in video-based instruction. The substantial rise from a pretest mean of 64.12 to a post-test mean of 81.76 aligns with the findings of Turfanda (2025) and Zheng et al. (2025), who reported notable improvements in language skills when interactive features such as quizzes and feedback were integrated into video materials. This improvement can be explained through Mayer's Cognitive Theory of Multimedia Learning. The interactive videos in this study applied several key principles, including the segmenting principle, signalling principle, and interactivity principle. By breaking content into manageable segments and providing immediate feedback, the videos reduced extraneous cognitive load and promoted deeper processing of English input, resulting in better vocabulary retention and listening comprehension.

The very large effect size (Cohen's  $d = 2.39$ ) indicates that interactive video-based learning is not only statistically effective but also practically powerful in a small-class madrasah setting. With only 17 students, the teacher could provide more personalized guidance, and students had greater opportunities to interact repeatedly with the materials, which may have amplified the learning gains compared to larger classes in previous studies. The strong gains in listening and vocabulary skills were expected because interactive videos offer rich auditory input combined with visual support and subtitles. This multimodal presentation helped students connect meaning more effectively than traditional textbook or audio-only methods commonly used in many Indonesian madrasahs.

The high positive perception reported by 94.1% of students further supports the quantitative results. Students felt more motivated and less anxious when learning through interactive videos, which is crucial in rural or semi-rural contexts where English exposure is limited and student confidence is often low. However, the pre-experimental design without a control group limits the ability to claim absolute causality. Some improvement might have resulted from increased familiarity with

the test or general maturation effects. Future studies should consider a quasi-experimental design with a control group to strengthen internal validity.

Despite the small sample size, the findings remain valuable for similar resource-limited madrasah environments. The use of accessible and low-cost tools such as Canva and Edpuzzle demonstrates that high-quality interactive learning materials can be created by teachers without advanced technical skills or expensive equipment. This study provides empirical evidence that interactive video-based learning is an effective instructional strategy for improving English learning outcomes under the Merdeka Curriculum. The combination of statistical significance, large effect size, and positive student perceptions suggests that this approach deserves wider adoption in Islamic senior high schools, especially in regions with limited resources.

## CONCLUSION

This study demonstrated that interactive video-based learning had a significant positive effect on students' English learning outcomes at SMA N 2 Kulisusu Utara. The implementation of interactive videos over eight weeks resulted in a substantial improvement, with the mean score increasing from 64.12 in the pretest to 81.76 in the post-test. The paired sample t-test confirmed this improvement was statistically significant ( $t = 9.87$ ,  $p < 0.001$ ) with a very large effect size (Cohen's  $d = 2.39$ ). These findings indicate that integrating interactive elements such as embedded quizzes, subtitles, and immediate feedback effectively enhanced vocabulary mastery, grammar, reading comprehension, and listening skills among the 17 eleventh-grade students.

The results of this research have important practical implications for English language teaching in madrasah settings, particularly in resource-limited and small-class environments under the Merdeka Curriculum. Interactive video-based learning offers a feasible, low-cost, and engaging alternative to traditional methods by utilizing accessible tools like Canva and Edpuzzle. The high level of student engagement and positive perceptions further suggest that this approach can increase motivation and reduce learning anxiety in contexts where students have limited exposure to authentic English materials. Based on the findings, it is recommended that English teachers in similar madrasah schools adopt interactive video-based learning as part of their instructional strategies. Future research should employ a quasi-experimental design with a larger sample and a control group to strengthen the generalizability of the results. Additionally, longitudinal studies are needed to examine the long-term retention of English skills acquired through interactive videos and to explore the integration of more advanced interactive features.

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