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The Impact of Interactive Videos on English Language Learning: Achievement and Attitudinal Outcomes in Turkish Fifth-Grade Classrooms*

Etkileşimli Videoların İngilizce Öğrenimine Etkisi: Beşinci Sınıflarda Başarı ve Tutumsal Sonuçlar

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ABSTRACT: This study investigated the effectiveness of interactive videos on English language achievement and attitudes among Turkish secondary school students. While interactive videos have shown promise in language education, empirical evidence regarding their impact on secondary school students' achievement and attitudes remains limited. Using a quasi-experimental design, 80 fifth-grade students were divided into experimental (n=42) and control (n=38) groups. The experimental group received instruction through interactive videos incorporating multiple-choice, fill-in-the-blank, drag-and-drop, true/false, and open-ended questions, while the control group received traditional instruction. Data were collected using pre- and post-tests for academic achievement and an attitude scale for English language learning. Results revealed a significant improvement in academic achievement for the experimental group compared to the control group, with a large effect size. However, no significant changes were observed in students' attitudes toward English language learning within or between groups. These findings highlight the cognitive benefits of interactive videos in fostering listening comprehension, vocabulary acquisition, and overall language proficiency, while suggesting that affective outcomes may require longer interventions or additional instructional strategies. This study contributes to the growing body of literature on technology-enhanced language learning and offers practical implications for integrating interactive videos into English language instruction.

Keywords: Academic achievement, English language learning, interactive videos, secondary school, student attitudes.

ÖZ: Bu çalışma, etkileşimli videoların Türkiye'deki ortaokul öğrencilerinin İngilizce dil başarısı ve tutumları üzerinde etkililiğini incelemiştir. Etkileşimli videolar dil eğitiminde umut vaat etse de, ortaokul öğrencilerinin başarı ve tutumları üzerindeki etkilerine dair deneysel kanıtlar sınırlıdır. Yarı deneysel bir desen kullanılarak 80 beşinci sınıf öğrencisi deney (n=42) ve kontrol (n=38) gruplara ayrılmıştır. Deney grubu, çoktan seçmeli, boşluk doldurma, sürükle-bırak, doğru/yanlış ve açık uçlu sorular içeren etkileşimli videolarla öğretim almış; kontrol grubu ise geleneksel öğretim yöntemleriyle eğitim görmüştür. Veriler, akademik başarı için ön-test ve son-test ile İngilizce öğrenmeye yönelik tutum ölçeği kullanılarak toplanmıştır. Sonuçlar, deney grubunun kontrol grubuna kıyasla akademik başarıda istatistiksel olarak anlamlı bir artış gösterdiğini ortaya koymuştur. Bununla birlikte, gruplar içinde veya arasında İngilizce öğrenmeye yönelik tutumlarda anlamlı bir değişiklik gözlemlenmemiştir. Bu bulgular, etkileşimli videoların dinleme becerisi, kelime edinimi ve genel dil yeterliliğini desteklemedeki bilişsel faydalarını vurgularken; duyuşsal sonuçlar için daha uzun süreli müdahaleler veya ek öğretim stratejileri gerektirebileceğine işaret etmektedir. Bu çalışma, teknoloji destekli dil öğrenimi alanyazınına katkı sunmakta ve etkileşimli videoların İngilizce öğretimine entegrasyonu için pratik çıkarımlar sağlamaktadır.

Anahtar kelimeler: Akademik başarı, etkileşimli videolar, İngilizce öğrenme, ortaokul, öğrenci tutumları.

* This study is based on the first author's MSc thesis research conducted under the supervision of the second author.

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The integration of digital technologies in education has transformed traditional teaching and learning practices, particularly in language education where interactive engagement is crucial to develop proficiency (Cao et al., 2023). Among various educational technologies, interactive videos have emerged as a promising tool that combines multimedia learning with active student participation, offering enhanced opportunities for student engagement and achievement (Wachtler et al., 2016).

Interactive videos differ from traditional educational videos by incorporating elements that require student response and engagement, such as embedded questions, clickable hotspots, and branching scenarios (Akram et al., 2023; Chatti et al., 2016). These features align with cognitive learning theories that emphasize the importance of active processing in knowledge construction (Clark & Mayer, 2016). In language education specifically, interactive videos can provide authentic contexts for language use while maintaining student engagement through structured interactions, offering various benefits including embedded quizzes, annotations, monitoring of student responses, and instant feedback (Bakla, 2017).

In the context of English language teaching, traditional instructional methods often struggle to maintain student engagement and provide authentic language exposure (Bakla & Demiröz, 2024). While video sharing platforms house countless videos on any topic, they do not guarantee learning and engagement (Chen, 2013). Interactive videos offer a potential solution by combining visual and auditory input with opportunities for active participation, enabling learners to progress at their own pace while receiving immediate feedback (Lin & Yu, 2023). However, despite their theoretical benefits, empirical evidence specifically addressing their effectiveness in secondary school English language instruction and their impact on learners' attitudes toward language learning remains limited (Polat & Taslibeyaz, 2024). The few existing studies have primarily focused on achievement outcomes, leaving a significant gap in our understanding of how interactive videos influence learners' attitudes and engagement with language learning materials.

The Turkish educational context presents a particularly interesting case to explore the effectiveness of interactive videos in English language instruction, particularly given the recent emphasis on technology integration and improving English language proficiency in national education reforms. As Turkish students often have limited exposure to English outside the classroom, innovative teaching tools like interactive videos may provide valuable support for enhancing both academic achievement and engagement (Bakla, 2017). However, while the cognitive benefits of interactive videos are well-documented, their impact on learners' attitudes toward English language learning remains underexplored. This study seeks to address these gaps by examining the role of interactive videos in improving English language achievement and investigating their potential influence on students' attitudes toward learning English in a secondary school context.

Literature Review

Interactive Videos in Education

Interactive videos have emerged as a transformative educational tool that extends beyond traditional passive viewing by incorporating elements such as

embedded quizzes, annotations, hyperlinks, and discussion prompts (Lin & Yu, 2023). These features align with Mayer's Cognitive Theory of Multimedia Learning, which emphasizes dual-channel processing and the importance of reducing extraneous cognitive load to optimize learning outcomes (Mayer & Pilegard, 2014). The interactive elements encourage active participation and self-regulated learning while supporting differentiated instruction by allowing learners to progress at their own pace(Bakla, 2017; Palaigeorgiou et al., 2019).

Recent studies have demonstrated various pedagogical affordances of interactive videos. Features such as "jump feedback," which redirects learners to relevant sections after incorrect responses, and embedded quizzes enhance learner comprehension and engagement (Bakla & Demiröz, 2024). These tools facilitate real-time feedback and formative assessment while enabling personalized learning experiences (Cummins et al., 2016; Nyland, 2017). Additionally, learning analytics derived from viewing patterns and quiz performance provide valuable insights for instructional decision-making processes (Kleftodimos & Evangelidis, 2016).

However, the design of interactive videos plays a critical role in their effectiveness. Research highlights the importance of carefully balancing the frequency and placement of interactive elements to prevent cognitive overload, as excessive interactivity can hinder learning rather than enhance it(Bakla & Demiröz, 2024; Polat & Taslibeyaz, 2024). For instance, frequent interruptions caused by interactive components may disrupt the natural flow of the video, creating what has been described as a "Christmas tree effect," where an overload of stimuli overwhelms learners (François, 2004, as cited in Bakla & Demiröz, 2024). This situation suggests the need for thoughtful instructional design that prioritizes both engagement and comprehension. By achieving an optimal balance of interactive elements, educators can maximize the instructional value of interactive videos while maintaining learner focus and motivation.

Impact on Language Learning Achievement

The use of interactive videos in language education has demonstrated significant potential for improving learning outcomes, particularly in areas such as listening comprehension, vocabulary acquisition, and overall language proficiency. The integration of interactive features transforms passive viewing into active learning, fostering deeper cognitive processing essential for language acquisition (Bakla, 2017; Bakla & Demiröz, 2024).

Studies have consistently demonstrated the positive impact of interactive videos on listening comprehension. Tweissi (2016) found that learners using interactive videos with embedded questions outperformed those using traditional videos, while Vural (2013) showed increased engagement time leading to improved listening outcomes. These findings align with Krashen's (1985) Input Hypothesis, as interactive videos allow learners to control their learning pace and ensure input remains comprehensible.

In addition to listening comprehension, interactive videos play a crucial role in vocabulary acquisition. By integrating activities such as vocabulary guesswork, writing definitions, and using words in sentences, interactive videos promote higher levels of cognitive engagement and retention. For example, (Bakla & Demiröz, 2024) found that these activities, combined with features like the "replay" function, encouraged deeper involvement with the material and improved vocabulary retention. This is consistent

with the Levels of Processing model proposed by Craik and Lockhart (1972), which posits that deeper cognitive engagement leads to better memory retention. Furthermore, the multimodal nature of interactive videos—incorporating visual and contextual cues such as images, subtitles, and annotations—helps learners infer the meaning of unfamiliar words and enhances their ability to recall and use new vocabulary in context (Smithwick et al., 2018). Zou and Xie (2019) also reported significant vocabulary gains among learners who used interactive videos created with EdPuzzle, which provided immediate feedback and contextualized vocabulary practice.

The integration of interactive videos into language instruction has also been linked to improvements in overall language proficiency. By combining listening, vocabulary, and critical thinking activities, interactive videos provide a holistic learning experience that supports multiple aspects of language development. For instance, Kolås (2015) found that interactive videos in MOOCs helped learners become active viewers, which improved their retention of content and overall language skills. Similarly, İpek, Kalay, and Ertaş (2021) reported that teacher candidates who engaged in peer learning through interactive videos in a blended learning environment demonstrated improvements in their language proficiency and critical thinking skills. These findings highlight the potential of interactive videos to foster not only linguistic competence but also higher-order thinking skills.

Moreover, interactive videos support self-regulated learning, which is a critical factor in language acquisition. Self-regulated learning strategies, such as planning, monitoring, and evaluating one's progress, can be effectively fostered through interactive video activities. Xu and Luo (2024) conducted a quasi-experimental study that revealed learners who received self-regulated learning training alongside interactive video instruction outperformed their peers in post-listening proficiency tests. This suggests that interactive videos not only enhance specific language skills but also promote the development of metacognitive strategies that are essential for long-term language learning success.

Impact on Learner Attitudes and Engagement

While the cognitive benefits of interactive videos are well-documented, their influence on learners' attitudes and engagement presents a more complex picture. Studies have shown that interactive videos can increase motivation and enjoyment by turning passive viewing into an active learning process (Lawson et al., 2006; Vural, 2013). For example, learners have reported that features like immediate feedback and discussion prompts make the learning experience more engaging and meaningful (Cummins et al., 2016).

However, some research has highlighted challenges related to the use of interactive videos. For instance, Polat and Taşlıbeyaz (2024) found that while interactive videos improved learning performance and reduced cognitive load, they had no significant impact on learners' long-term engagement or emotional satisfaction. Similarly, Bakla and Mehdiyev (2022) reported that learners preferred YouTube videos for their entertainment value but found teacher-created interactive videos more instructive due to their interactive components.

Cultural and contextual factors also play a role in shaping learners' attitudes toward interactive videos. For example, Turkish EFL learners often prioritize "correct

answers" over open-ended discussions, which can limit the effectiveness of interactive elements like discussion questions (Bakla & Demiröz, 2024). This highlights the need for culturally sensitive instructional design that aligns with learners' expectations and preferences.

The Present Study

Despite the growing body of literature on interactive videos, several gaps remain. First, most studies have focused on higher education or adult learners, with limited research on secondary school students. Second, while the cognitive and academic benefits of interactive videos are well-documented, their impact on learners' attitudes and engagement requires further exploration. Finally, there is a lack of research examining the use of interactive videos in the Turkish educational context, where unique challenges and opportunities exist (Bakla, 2017; Polat & Taslibeyaz, 2024).

This study aims to address these gaps by investigating the effectiveness of interactive videos in improving English language achievement and examining their influence on students' attitudes and engagement with language learning materials. The research questions guiding this study are as follows:

1. To what extent do interactive videos improve the English language achievement of fifth-grade secondary school students, as measured by pre- and post-test performance?

2. How do interactive videos influence students' attitudes toward English language learning?

Method

Participants

The study was conducted during the 2023–2024 academic year in a public secondary school located in Kilis, Turkey. The participants consisted of 80 fifth-grade students, with 42 female (52.5%) and 38 male (47.5%) students. These students were divided into two groups: an experimental group with 42 students and a control group with 38 students. Each group was taught by the same teacher to ensure consistency in instructional delivery in classrooms equipped with comparable technological infrastructure, including smartboards.

The experimental group received instruction supported by interactive videos, while the control group was taught using traditional teaching methods. Ethical approval for this study was obtained from the Scientific Research and Publication Ethics Committee for Science and Engineering at Afyon Kocatepe University dated 19.03.2024 and numbered 258742. Additionally, permission to conduct the research was granted by the Kilis Provincial Directorate of National Education. Informed consent was obtained from all participants and their parents prior to the study. The research adhered to ethical guidelines, ensuring the confidentiality and anonymity of participants, voluntary participation, and the right to withdraw from the study at any time without any consequences.

Treatment

The experimental group participated in an instructional program that incorporated interactive videos designed to align with the fifth-grade English curriculum. These interactive videos were developed to cover two curriculum units: "My Daily Routine" and "Health", with the "Telling the Time" topic from the "My Daily Routine" unit prepared as a separate section. As a result, the interactive video content was organized into three main sections: "Telling the Time", "My Daily Routine", and "Health", with a total of three interactive videos for each section.

The videos were designed with the goal of improving students' academic achievement and were tailored to meet the learning outcomes outlined in the Ministry of National Education's English Curriculum for the fifth grade. The interactive videos were designed and refined based on Mayer's Cognitive Theory of Multimedia Learning, which emphasizes reducing extraneous cognitive load and fostering active engagement (Mayer & Pilegard, 2014). This approach aligns with Sweller's Cognitive Load Theory (Sweller, 2020), which distinguishes between intrinsic, extraneous, and germane cognitive load. The interactive elements were strategically placed to manage intrinsic load (the inherent complexity of language learning), reduce extraneous load (through clear instructions and intuitive interfaces), and optimize germane load (by encouraging meaningful processing through varied question types).

Furthermore, the design incorporated principles of self-regulated learning (SRL) as conceptualized by Zimmerman (2000), enabling students to engage in the cyclical process of forethought, performance, and self-reflection. The interactive videos supported the forethought phase by establishing clear learning goals for each section; facilitated the performance phase through active engagement with embedded questions; and enabled self-reflection through immediate feedback mechanisms. This approach is particularly relevant for language learning contexts where learners must monitor their comprehension and adjust their strategies accordingly (Tseng et al., 2006). The varied question types (multiple-choice, fill-in-the-blank, drag-and-drop, true/false, and open-ended) were designed to scaffold different levels of self-regulation, from basic recognition to more complex application and evaluation of language knowledge.

The videos included five different question types to actively engage students and assess their understanding, such as multiple-choice questions to reinforce comprehension and test knowledge, fill-in-the-blank exercises to encourage active recall and application of vocabulary and grammar, drag-and-drop activities to promote hands-on interaction and reinforce key concepts, true/false questions to check understanding of specific content and open-ended questions to encourage critical thinking and allow students to express their understanding in their own words. The interactive videos were carefully structured to include a balanced distribution of question types across the three main sections. Table 1 below present the breakdown of the question types across the three sections.

Table 1

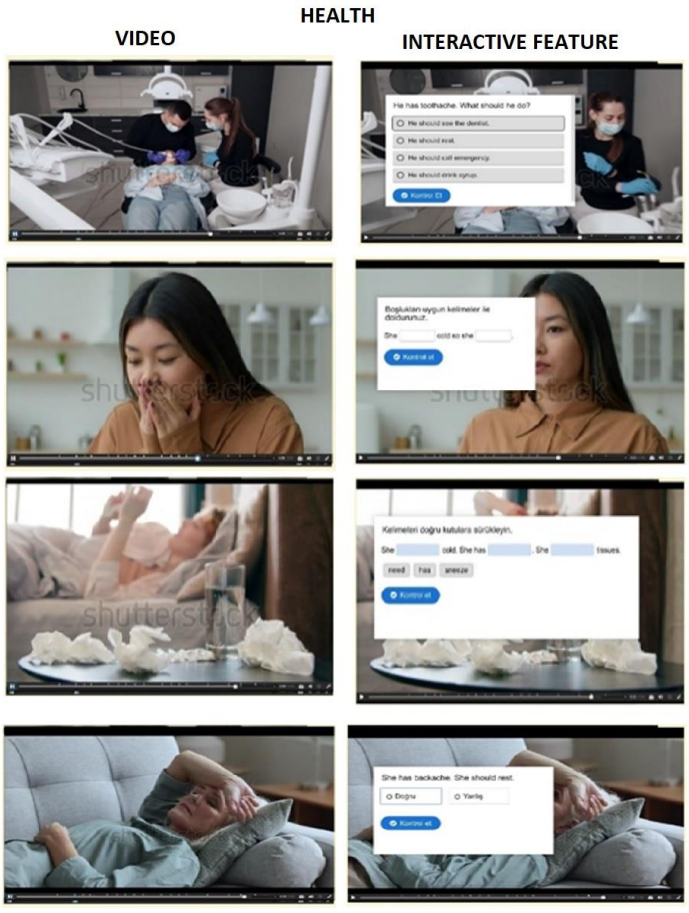
The Breakdown of Questions in the Interactive Videos

Sections	Number of Interactions	Types of Questions				
		Multiple-choice	Fill-in-the-blank	Drag-and-drop	Open-ended	True/False
Telling the Time	12	6	2	2	1	1
My Daily Routine	23	14	4	4	1	0
Health	16	6	5	2	0	3

This distribution ensured that the interactive elements were varied and aligned with the specific learning objectives of each section, providing students with opportunities to engage with the material in multiple ways. Figure I below illustrates the different interactive features incorporated into the "Health" unit, including multiple-choice questions, fill-in-the-blank exercises, drag-and-drop activities and true/false questions. These features were designed to promote active engagement, reinforce key concepts, and provide immediate feedback to support student learning.

Figure 1

Illustrations of Sample Videos and Interactive Features Designed for Health Unit



At the beginning of the academic year, the English teacher incorporated the use of interactive videos into the annual and daily lesson plans for the classes where the study was conducted. The study followed a structured timeline to ensure consistency in data collection and instructional delivery. One week before the treatment began, all participants (both experimental and control groups) completed a pretest and an attitude scale to assess their baseline academic achievement and attitudes toward English. The treatment began in the following week and lasted for a total of three 40-minute lessons. This schedule ensured that students in both groups received the same amount of instructional time, with the primary difference being the mode of delivery. After the treatment concluded, all participants completed a posttest and the attitude scale again to measure the impact of the intervention.

The interactive videos were integrated into the experimental group's lessons during class time through a dedicated website (www.etkilesimlivideo.com.tr) for additional practice. The website was designed to provide a user-friendly and interactive learning environment. The teacher monitored students' progress and provided feedback during lessons to ensure effective use of the videos. The lessons were conducted in classrooms equipped with smartboards, which facilitated the integration of the videos into the teaching process. The teacher guided students through the videos, provided additional explanations when necessary, and facilitated discussions based on the interactive tasks.

In contrast, the control group followed the same curriculum content but was taught using traditional methods, such as teacher-led instruction, printed materials, and classroom discussions. The control group did not have access to the interactive videos or any digital tools, ensuring that the primary difference between the groups was the mode of instruction.

Data Collection Tools

Two primary instruments were used to collect data: Academic Achievement Tests and an English Course Attitude Scale. The Academic Achievement Tests were developed specifically for the two curriculum units, "My Daily Routines" and "Health". Each unit-specific test consisted of 20 multiple-choice questions, with four options per question. To ensure comprehensive assessment, the final test included a total of 40 questions, combining items from both units. The questions were presented in a random order to minimize the potential for response patterns and ensure a more accurate measurement of students' knowledge across the two units.

The test items were reviewed by two subject matter experts and one language expert to ensure validity. The reliability of the tests was calculated using the Kuder-Richardson Formula 20 (KR-20), yielding acceptable reliability coefficients of 0.78 for the "My Daily Routines" test and 0.87 for the "Health" test. The difficulty index for the tests was also calculated by dividing the number of students who answered each item correctly by the total number of students who attempted the item, then averaging these values across all items. This calculation resulted in difficulty index values of 0.527 for the "My Daily Routines" test and 0.542 for the "Health" test, indicating moderate difficulty levels where approximately half of the students answered items correctly.

The scoring of the achievement tests was straightforward: each correct answer was awarded 1 point, while incorrect answers received 0 points. The total raw score for

the combined test ranged from 0 to 40. To facilitate interpretation and comparison, the raw scores were converted to a scale of 0 to 100 by multiplying the raw score by 2.5. This conversion ensured consistency in reporting and allowed for easier comparison of results across different groups.

The English Course Attitude Scale, developed by Aydoğmuş and Kurnaz (2017), was used to assess students' attitudes toward English language learning. The scale consisted of 14 items equally divided between positive and negative statements. It employed a three-point rating system: Yes (3 points), Partially (2 points), and No (1 point) for positive statements, and the reverse scoring was applied for negative statements (No = 3 points, Partially = 2 points, Yes = 1 point).

The construct validity of the scale was established through Kaiser-Meyer-Olkin (KMO) and Bartlett's tests. The KMO value of 0.90 indicated excellent sampling adequacy, and Bartlett's test of sphericity ($\chi^2 = 1801.421$, $p < .01$) confirmed the scale's suitability for use with secondary school students. The scale demonstrated high reliability, explaining approximately 58% of the variance in students' attitudes toward English language learning, with a Cronbach's alpha reliability coefficient of 0.87.

Data Analysis

Data analysis was conducted using the Statistical Package for Social Sciences (SPSS). The analysis included both descriptive and inferential statistics. Descriptive statistics entailing means, standard deviations, and frequency distributions were calculated to summarize demographic characteristics of the participants and their pretest and posttest scores.

For inferential statistics, paired-samples t-tests were conducted to compare the pretest and posttest scores within each group (experimental and control) to determine the effectiveness of the instructional methods. Independent-samples t-tests were used to compare the posttest scores between the experimental and control groups to evaluate the impact of the interactive video intervention on academic achievement and attitudes.

To assess the practical significance of the findings and quantify the magnitude of the intervention's effect, effect size calculations were performed. Cohen's d was calculated for all t-test comparisons, with values of 0.2, 0.5, and 0.8 representing small, medium, and large effect sizes, respectively (Cohen, 1988). Additionally, eta squared (η^2) was computed to determine the proportion of variance in the dependent variables (achievement and attitudes) that could be attributed to the interactive video intervention. Following Cohen's guidelines, η^2 values of .01, .06, and .14 were interpreted as small, medium, and large effect sizes, respectively. These effect size measures provided complementary information about the practical significance of the statistical findings and facilitated comparisons with similar studies in the literature.

Results

Preliminary Analyses

Prior to conducting the main analyses, the assumptions of normality were tested. The Shapiro-Wilk test was performed to assess the distribution of scores for both achievement and attitude measures. For the achievement test scores, results indicated normal distribution in both experimental and control groups ($p > .05$). However, the

attitude scale data violated the assumptions of normal distribution ($p < .05$), necessitating the use of non-parametric tests for attitude-related analyses.

Academic Achievement

Pretest Comparisons Between Groups

An independent-samples t-test was conducted to compare the pretest scores of the experimental and control groups to ensure equivalence at the beginning of the study. The results indicated no statistically significant difference between the groups, $t(78) = 0.45$, $p = .619$, suggesting that both groups were comparable in terms of their initial English language achievement.

Within-Group Comparisons

Paired-samples t-tests were conducted to examine the differences between pretest and posttest scores within each group. For the experimental group, the mean pretest score was $M = 33.75$ ($SD = 9.55$), which increased to $M = 57.30$ ($SD = 15.73$) on the posttest. The paired-samples t-test revealed a statistically significant improvement, $t(41) = 5.38$, $p < .001$, with a large effect size ($d = .83$), indicating a substantial impact of the interactive video intervention on academic achievement. As for the control group, the mean pretest score was $M = 34.35$ ($SD = 10.58$), which increased slightly to $M = 36.43$ ($SD = 16.18$) on the posttest. However, the paired-samples t-test did not show a statistically significant improvement, $t(37) = .96$, $p = .34$, with a negligible effect size ($d = .15$). These results suggest that traditional teaching methods did not lead to significant changes in academic achievement.

Posttest Comparisons Between Groups

An independent-samples t-test was conducted to compare the posttest scores of the experimental and control groups. The results indicated a statistically significant difference, $t(78) = 3.62$, $p < .001$, with the experimental group ($M = 57.30$, $SD = 15.73$) outperforming the control group ($M = 36.43$, $SD = 16.18$). The effect size was large ($d = .81$, $\eta^2 = .14$), indicating that the interactive video intervention had a substantial impact on students' academic achievement compared to traditional teaching methods.

Attitudes Toward English Language Learning

Pretest Comparisons Between Groups

Since the data for the attitudes scale did not meet the assumption of normality, the Mann-Whitney U test was used to compare the pretest scores of the experimental and control groups. The results indicated no statistically significant difference between the groups, $U = 748.10$, $p = .612$, $r = 0.03$ suggesting a small effect size and that both groups had similar attitudes toward English language learning at the beginning of the study.

Within-Group Comparisons

To examine changes in attitude scores within each group, the Wilcoxon signed-rank test was used. For the experimental group, the mean pretest attitude score for the experimental group was $M = 2.01$ ($SD = 0.13$), which remained relatively stable at $M =$

2.02 (SD = 0.07) on the posttest. However, the Wilcoxon signed-rank test revealed no statistically significant difference, Z = -0.360, p = .719, r = 0.06 suggesting a negligible effect size and that the interactive video intervention did not significantly influence students' attitudes toward English language learning.

As for the control group, the mean pretest attitude score for the control group was M = 2.01 (SD = 0.12), which slightly improved to M = 2.04 (SD = 0.15), on the posttest. The Wilcoxon signed-rank test also showed no statistically significant difference, Z = -1.027, p = .305, r = 0.17 indicating a small effect size and that traditional teaching methods did not significantly affect students' attitudes.

Posttest Comparisons Between Groups

The Mann-Whitney U test was used to compare the posttest attitude scores of the experimental and control groups. The results indicated no statistically significant difference, U = 765.00, p = .578, r = 0.04 suggesting a small effect size and that the interactive video intervention did not lead to a measurable change in students' attitudes toward English language learning compared to traditional teaching methods.

Summary of Results

The findings of the study indicate that the use of interactive videos significantly improved the academic achievement of fifth-grade students in the experimental group compared to the control group, as evidenced by both within-group and between-group comparisons. The effect size calculations further highlight the substantial impact of the intervention on learning outcomes. However, the results also suggest that the interactive video intervention did not significantly influence students' attitudes toward English language learning during the treatment period, as no significant differences were observed within or between groups in the pretest and posttest attitude scores.

Discussion

The findings of the study provide valuable insights into the effectiveness of interactive video in English language instruction for secondary school students, particularly in the Turkish context. The results revealed that the use of interactive videos significantly improved students' academic achievement in English, as evidenced by the substantial increase in the posttest scores for the experimental group compared to the control group. However, the intervention did not yield significant changes in students' attitudes toward English language learning. These findings align with and extend the existing literature on the pedagogical affordances of interactive videos, while also highlighting some limitations and contextual considerations.

The significant improvement in academic achievement corroborates earlier studies that emphasize the cognitive benefits of interactive videos in language learning. For instance, Bakla (2017) and Bakla and Demiröz (2024) highlighted how interactive videos transform passive viewing into active learning by incorporating features such as embedded quizzes, immediate feedback and "jump feedback." These features not only enhance comprehension but also promote deeper cognitive engagement, as supported by Mayer's Cognitive Theory of Multimedia Learning (Mayer & Pilegard, 2014). The present study's findings are consistent with Tweissi (2016) and Vural (2013), who reported that learners using interactive videos outperformed those using traditional

methods in listening comprehension and vocabulary acquisition. The large effect size observed in this study further underscores the potential of interactive videos to foster meaningful learning outcomes.

The interactive videos used in this study incorporated a variety of question types, such as multiple-choice, fill-in-the-blank, and open-ended questions, which likely contributed to the observed improvements in academic achievement. These activities align with the Levels of Processing model (Craik & Lockhart, 1972), which posits that deeper cognitive engagement leads to better retention and understanding. The inclusion of vocabulary-focused activities which requires working with the target vocabulary items as discrete units also aligns with findings from Bakla and Demiröz (2024), who noted that such activities encourage higher-order thinking and improve vocabulary retention. Additionally, the multimodal nature of interactive videos—combining visual, auditory, and textual input—likely supported learners in inferring the meaning of unfamiliar language and contextualizing their learning, as suggested by Guichon & Cohen (2016).

Despite the cognitive benefits, the lack of significant changes in students' attitudes toward English language learning warrants further discussion. This finding aligns with Polat and Taşlıbeyaz (2024), who reported that while interactive videos improved learning performance, they did not significantly impact learners' long-term engagement or emotional satisfaction. One possible explanation is that the novelty of the interactive videos may not have been sufficient to overcome pre-existing attitudes toward English learning, which are often shaped by broader cultural and educational factors. For example, Turkish learners' preference for correct answers over open-ended discussions, as noted by Bakla and Demiröz (2024), may have limited their engagement with certain interactive elements, such as discussion questions. This cultural tendency could explain why the interactive videos did not significantly influence attitudes, despite their potential to foster active participation and enjoyment.

An important methodological consideration concerns the duration of the intervention. The three-week treatment period, while sufficient to demonstrate cognitive gains in academic achievement, may have been insufficient to produce measurable changes in learners' attitudes toward English language learning. Attitudinal shifts typically require sustained exposure and habituation to new instructional methods, as evidenced by studies such as Xu and Luo's (2024) six-month longitudinal investigation of technology-enhanced language learning, which documented gradual attitude improvements over time. This temporal constraint aligns with Krathwohl's (2002) taxonomy of affective domain development, where attitude formation progresses through stages of receptivity, valuation, and internalization – processes unlikely to occur within a brief intervention window. Consequently, our null findings regarding attitudinal outcomes should be interpreted as reflecting temporal limitations rather than inherent shortcomings of interactive video pedagogy. This duration-related constraint also interacts with cultural factors; Turkish students' established preferences for structured learning environments (Bakla & Demiröz, 2024) may require extended adaptation periods for new technologies to influence affective dispositions. Future research should investigate whether implementations spanning 8-12 weeks yield different affective outcomes while maintaining the cognitive benefits observed here.

Additionally, the quantitative nature of our attitude assessment may have limited our ability to detect subtle changes in students' perceptions. Future studies would benefit from incorporating qualitative methods such as student interviews, reflective journals, or focus groups to capture nuanced shifts in motivation, confidence, and engagement that may not be evident in Likert-scale responses. Such mixed-methods approaches could provide valuable insights into how students experience interactive videos and how these experiences might gradually reshape their attitudes toward language learning over time.

From a practical implementation perspective, educators seeking to integrate interactive videos into language instruction should consider several key recommendations. First, interactive elements should be strategically distributed throughout videos to maintain engagement without causing cognitive overload, with approximately 15-20 interactions per 40-minute lesson as demonstrated effective in this study. Second, a variety of question types should be incorporated to address different learning preferences and cognitive processes. Third, to potentially influence attitudinal outcomes, interactive videos might be complemented with additional motivational strategies such as gamification elements (points, badges, leaderboards), collaborative viewing and discussion activities, or personalized learning paths that respond to individual student performance. Fourth, cultural considerations should inform implementation; for instance, in contexts like Turkey where structured learning environments are preferred, a gradual transition from more guided to more open-ended interactive elements may be beneficial. Finally, sustained implementation over longer periods (8-12 weeks minimum) is recommended to potentially influence affective outcomes while maintaining the cognitive benefits observed in this study.

Conclusion

This study demonstrates the significant potential of interactive videos to enhance academic achievement in English language instruction for secondary school students. By transforming passive viewing into an active learning process, interactive videos provide a powerful tool for fostering listening comprehension, vocabulary acquisition, and overall language proficiency. The findings align with existing research, such as Bakla (2017), Bakla and Demiröz (2024) and Polat and Taslibeyaz (2024) and contribute to the growing body of evidence supporting the use of interactive videos in educational settings.

However, the study also highlights some limitations and areas for improvement. The lack of significant changes in students' attitudes toward English language learning suggests that interactive videos alone may not be sufficient to address affective outcomes. Future research should explore how interactive videos can be combined with other instructional strategies, such as self-regulated learning and culturally sensitive design, to foster both cognitive and affective engagement. Additionally, while the study demonstrates interactive videos' efficacy for short-term academic gains, the three-week intervention period precludes definitive conclusions about their capacity to influence learner attitudes. The absence of attitudinal change should therefore be contextualized within these temporal constraints rather than interpreted as evidence against interactive videos' affective potential. Future investigations should employ intervention durations

spanning over a longer period of time to allow for potential attitude formation processes while maintaining the observed cognitive benefits.

From a practical perspective, educators should consider integrating interactive videos into their teaching practices to enhance learning outcomes. However, they must carefully design and implement these tools to ensure that the interactive elements are appropriately balanced and aligned with learners' needs. By doing so, interactive videos can serve as a valuable addition to the language teacher's toolbox, offering a dynamic and engaging approach to language instruction.

To sum up, while interactive videos hold great promise for improving academic achievement in language learning, their full potential can only be realized through thoughtful design, sustained implementation, and a deeper understanding of their impact on learners' attitudes and engagement. This study provides a significant contribution to the current literature by offering empirical evidence on the effectiveness of interactive videos in enhancing academic achievement and highlighting the need for further exploration of their influence on learner attitudes and engagement.

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Statement of Responsibility

Both authors confirm that they have made substantial contributions to the research and preparation of this manuscript. Specifically, the first author was responsible for the conceptualization and design of the study, the development of the interactive videos, data collection, and the drafting of the manuscript. The second author provided methodological guidance and validation, contributed to the data analysis, interpretation of the results, and critical revision of the manuscript for important intellectual content. Both authors have reviewed and approved the final version of the manuscript and take full responsibility for its content.

Conflicts of Interest

The authors have no competing interests to declare that are relevant to the content of this article.

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Appendix

Sample Questions from the Achievement Test:

1. What does he do in the mornings?

a) He combs his hair. b) He wakes up early.
c) He gets dressed. d) He brushes his teeth.

2. What does he do in the mornings?

a) He runs in the mornings.
b) He plays tennis in the mornings.
c) He does exercises in the mornings.
d) He has a breakfast in the mornings.

3. What time is it?

a) It is twenty to twelve. b) It is twenty four past  twelve.
c) It is twenty past twelve. d) It is half past twelve.

4. What time is it?

a) It is hall past one. b) It is twenty past two.
c) It is half past three. d) It is quarter to three.

5. You have ……. You shouldn't carry heavy things.

a) a headache b) a backache
c) the flu d) a toothache

6. You shouldn't …….. all day. Go out play in the garden

a) drink milk b) do sports
c) eat fruit and vegetables d) play computer

Attitude Scale for English Lesson:

Adınız-Soyadınız	
Sınıfınız	
Bir Önceki Yılda İngilizce Karne Notunuz	
Cinsiyetiniz	Kız( ) Erkek( )
Annenizin Eğitim Durumu	İlkokul( ) Ortaokul( ) Lise( ) Üniversite( ) Lisansüstü( )
Babanızın Eğitim Durumu	İlkokul( ) Ortaokul( ) Lise( ) Üniversite( ) Lisansüstü( )
Geçen Yıla Ait Not Ortalamanızı Yüzlük Sisteme Göre Belirtiniz	
İngilizce Öğrenmeye Ne Zaman Başladınız	Anaokul( ) İlkokul( ) Ortaokul( )

Tutum İfadeleri	Evet	Kısmen	Hayır
1.İngilizce dersinin önemli olduğunu düşünüyorum	( )	( )	( )
2. İngilizce dersini seviyorum	( )	( )	( )
3.Okulda İngilizce dersi kaldırılsa iyi olur	( )	( )	( )
4.İngilizce dersinde genellikle çok sıkılırım	( )	( )	( )
5.İngilizce derslerini dört gözle bekliyorum	( )	( )	( )
6.İngilizce derslerinden nefret ederim	( )	( )	( )
7.İngilizce dersleri beni strese sokar	( )	( )	( )
8.İngilizceyi öğrenmek bana çoğu zaman zor gelir	( )	( )	( )
9.İngilizce dersini zevkli buluyorum	( )	( )	( )
10.İngilizce çalışmaktan sıkılıyorum	( )	( )	( )
11.İngilizce öğrenmenin gereksiz olduğunu düşünüyorum	( )	( )	( )
12.İngilizcenin yaşamda önemli olduğunu düşünüyorum	( )	( )	( )
13.İngilizce dersinin ödevlerini zevkle yaparım	( )	( )	( )
14.İngilizce dersinde başarılı olacağımdan eminim.	( )	( )	( )

Katılımınız için teşekkürler.