

THE IMPLEMENTATION OF COGNITIVE AND EMOTIONAL-BASED INTERACTIVE VIDEO TO IMPROVE LISTENING SKILL AT SENIOR HIGH SCHOOL 1 BLITAR

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Abstract: This study aims to examine the instructional procedures and the effectiveness of cognitively and emotionally based interactive video in improving Arabic listening skills of tenth-grade students at senior high school 1 Blitar. This research employed a mixed-method approach with a quasi-experimental non-equivalent control group design. The research subjects consisted of two classes: an experimental class taught using cognitively and emotionally based interactive video and a control class taught using conventional instructional methods. Data were collected through listening tests (pretest and posttest), questionnaires, and documentation. Quantitative data were analyzed using normality testing, homogeneity testing, an independent samples t-test, and N-Gain analysis, while qualitative data were analyzed descriptively. The results indicate that listening instruction using cognitively and emotionally based interactive video was implemented systematically and successfully enhanced students' cognitive and emotional engagement. Furthermore, there was a significant difference between the listening achievement of students in the experimental and control classes, with the experimental class showing a higher improvement in listening skills. Therefore, cognitively and emotionally based interactive video is proven to be an effective instructional medium for improving Arabic listening skills at the senior high school level.

Keywords: Interactive Videos, Arabic Language Learning, Listening Skills, Cognitive and Emotional Aspects

Introduction

Empirical findings at Senior High School 1 Blitar indicate that students' low listening proficiency is not solely caused by limited vocabulary, but also by the lack of instructional media that can assist students in processing spoken information in a structured and contextual manner. Based on classroom observations and interviews with the Arabic language teacher, listening instruction is still predominantly characterized by the use of conventional audio materials without adequate visual support, as well as minimal interactive activities that encourage active student engagement. This condition leads students to experience difficulties in comprehending meaning comprehensively and to remain passive throughout the learning process.¹ This situation reflects a gap between curriculum demands that emphasize interactive learning and the actual listening skill achievement of students in the classroom.

In response to these challenges, there is a need for instructional media that not only delivers information but also activates students' cognitive processes and emotional engagement simultaneously.² Cognitive and emotional based interactive video represents a relevant alternative in this context.³ This medium integrates audio, visual elements, text, animation, as well as embedded questions and feedback, enabling students to interact directly with the learning content.⁴

In language learning, particularly in listening skills at the senior high school level, interactive video has the potential to facilitate more structured, contextual, and meaningful language input processing⁵.

¹ Muhammad Ainul Haq Muh Sabilar Rosyad, "Efektivitas Situs Berbasis Kecerdasan Buatan Dalam Mendesain Tes Keterampilan Mendengar," *JALIE: Journal of Applied Linguistics and Islamic Education Volume 06, Nomor 01, Maret 2022*; p-ISSN: 2549-7804; e-ISSN: 2549-8622; 27-44 06 (2022): 27-44.

² Muhajir Faiq Ilham Rosyadi, Sugeng Sugiyono, "Transformation Of Arabic Language Education : A Structural-Functional Perspective," *JALIE: Journal of Applied Linguistics and Islamic Education Volume 09, Nomor 02, September 2025*; p-ISSN: 2549-7804; e-ISSN: 2549-8622; 367-388 09, no. September (2025): 367-88, <https://doi.org/10.36722/sh.v2i3.145.5>.

³ Yunfei Du and Barry Lee Reynolds, "Rooted in and beyond Interaction: A Systematic Review of Interactive Affordances of Chatbots for Language Learning amidst the Rise of Large Language Models," *Acta Psychologica* 259, no. June (2025): 105307, <https://doi.org/10.1016/j.actpsy.2025.105307>.

⁴ Nurwilis Elsa Zahara, "Journal of English Language Teaching Using Edpuzzle Interactive Video to Enhance Listening Skills" 6, no. 1 (2025): 334-44.

⁵ Hani'atul Khoiroh, "Efektivitas Penggunaan Aplikasi Canva Sebagai Media Pembelajaran Dalam Meningkatkan Kreativitas Dan Keterampilan Menulis (Maharah Kitabah) Mahasiswa Universitas KIAI Abdullah Faqih Gresik," *JALIE: Journal of*

Information is received through both auditory and visual channels and reinforced through active responses, which enhances comprehension effectiveness. From a cognitive perspective, this medium supports learners in selecting, organizing, and integrating information more systematically⁶. From an emotional perspective, engaging visuals, contextual narration, and immediate feedback can increase students' motivation, attention, and self-confidence. Therefore, the integration of cognitive and emotional dimensions makes interactive video pedagogically relevant in addressing the listening challenges identified at Senior High School 1 Blitar and aligns with the characteristics of twenty-first-century learners.

Previous studies further strengthen the potential of interactive video in language learning. Rachel found that the application of interactive video in Arabic language learning increased students' learning interest and facilitated comprehension.⁷ Nur Syafiqah demonstrated that interactive video-based teaching strategies effectively enhanced students' Arabic speaking skills at the secondary level.⁸ In the context of listening, Pamungkas and Nguyen reported that interactive video had a significantly positive effect on students' listening skills compared to conventional media.⁹ In addition, Almaliki emphasized that cognitive and emotional-based interactive video significantly improved listening skills in terms of both learning outcomes and student engagement.¹⁰

Although previous studies have demonstrated the potential of interactive video in language learning, most of these studies still exhibit significant methodological limitations. Many have primarily focused on measuring students' perceptions, learning interest, or motivation

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⁶ Sindy Lita Kumala, "The Implementation of the Cognitive Theory of Multimedia Learning in the Design and Evaluation of an AI Educational Video Assistant Utilizing Large Language Models," | *109 Journal of Economics and Regional Science*, 2021.

⁷ Rachel Annisa Misky, "تطبيق وسائط الفيديو التفاعلية في تعليم اللغة العربية بمنهج مردیکا في الفصل 1، سوكراجا، السابع في المدرسة المتوسطة الإسلامية معارف نهضة العلماء"، 2024.

⁸ Nur Syafiqah Muhamad, "Teaching Strategies Based on Interactive Video in Enhancing the Skill of Speaking in Arabic Language Among Form Six Students at Maahad Muhammadiyah Lilbanat." 4, no. 2 (2022): 58–78.

⁹ Dicky Pamungkas, Zohri Hamdandi, and Candraning Prihatini, "Interactive Video Aided Interactional on Students' Listening Skill," *Syntax Idea* 6, no. 2 (2024): 642–52, <https://doi.org/10.46799/syntax-idea.v6i2.2975>.

¹⁰ الأول السمعي لمادة اللغة الإنجليزية لذي طالب الاستيعاب أثر استخدام الفيديو التفاعلي يف تنمية مهارة" .n.d., الصف املتسط امللكي سامل سامل سلمان

through questionnaire-based data, without employing experimental designs that allow for comparative effectiveness testing. Furthermore, several studies have relied on relatively small sample sizes and have not implemented adequate experimental controls, thereby limiting the generalizability of their findings. In terms of data analysis, some research has not been supported by sufficiently rigorous statistical testing to objectively confirm the significance of skill improvement.

In addition, most prior research has examined interactive video in a general sense without specifically emphasizing the integration of cognitive and emotional dimensions in instructional media design. The research focus has also largely been directed toward primary and junior secondary education levels, as well as toward speaking skills, vocabulary mastery, or learning motivation. Studies that specifically investigate the effectiveness of cognitive and emotional-based interactive video in improving Arabic listening skills at the Islamic senior high school level remain scarce.

These methodological and conceptual limitations indicate the need for research employing a more systematic and controlled design to empirically examine the effectiveness of the instructional media. Therefore, the present study seeks to address this gap by applying a more structured experimental approach to evaluate the effectiveness of cognitive and emotional-based interactive video in enhancing Arabic listening skills.

Based on this rationale, the present study aims to examine the instructional procedures of implementing cognitive and emotional-based interactive video and to investigate the effectiveness of its application in improving Arabic listening skills at State Islamic Senior High School 1 Blitar compared to conventional instruction. Through this focus, the study is expected to contribute empirically to the development of Arabic language learning media and to offer practical solutions for teachers in enhancing the quality of listening instruction at the senior secondary level.

Literature Review

Interactive Video from Cognitive Load Perspective

Interactive video is a form of multimedia learning that integrates text, images, audio, animation, and interactive features to promote active learner engagement. Within the framework of the Cognitive Theory of Multimedia Learning, learning occurs through dual-channel processing between visual and auditory pathways, involving the

processes of selecting, organizing, and integrating information.¹¹ However, the effectiveness of this processing largely depends on the management of cognitive load.

Recent research indicates that poorly structured multimedia design may increase extraneous cognitive load, thereby hindering comprehension.¹² Therefore, features such as segmentation, learner control, replay options, and embedded feedback in interactive video serve to reduce irrelevant cognitive load while optimizing germane cognitive load that supports schema construction.¹³ In this sense, interactive video does not merely present information; rather, it operationally facilitates more efficient and structured cognitive processing.

Integration of Emotional Engagement in Learning

Although cognitive processing constitutes the primary foundation of learning, contemporary research in educational psychology emphasizes that emotional engagement plays a crucial role in determining academic success.¹⁴ Emotional engagement encompasses motivation, attention, interest, and self-regulation, all of which influence learners' readiness to receive and process instructional input.

In the context of interactive video, elements such as contextual narration, appealing visuals, authentic scenarios, and immediate feedback function as affective stimuli that enhance motivation and reduce learning anxiety.¹⁵ Recent empirical studies demonstrate that emotional engagement mediates the relationship between digital instructional strategies and academic achievement.¹⁶ This suggests that

¹¹Richard E. Mayer and Richard E. Mayer, "Version of Record: <https://www.sciencedirect.com/science/article/pii/S2211368121000231>," 2021.

¹²John Sweller, Jeroen J. G. Merriënboer, and Fred Paas, "Cognitive Architecture and Instructional Design: 20 Years Later," *Educational Psychology Review*, 2019, 261–92, <https://doi.org/10.1007/s10648-019-09465-5>.

¹³R. E. Fiorella, L., & Mayer, "What Works and Doesn't Work with Instructional Video. *Computers in Human Behavior*," 2018, 89, 465–470.

¹⁴Rita Friães and Adriana Cardoso Nadine Correia, Tiago Almeida, "Bridging Pedagogy, Curriculum, and Assessment in Digital Education: Ensuring a Constructive Alignment Nadine" 13 (2025): 1–22.

¹⁵B. D. Um, E. R., Plass, J. L., Hayward, E. O., & Homer, "Emotional Design in Multimedia Learning. *Journal of Educational Psychology*," 2017, 109, 485–498.

¹⁶W. Lei, H., Cui, Y., & Zhou, "Relationships between Student Engagement and Academic Achievement: A Meta-Analysis. *Social Behavior and Personality*," 2018, 46(3), 517–528.

while multimedia design may optimize cognitive processing, learning performance is strongly influenced by the degree of emotional involvement experienced by learners during the instructional process.

Interactive Video and Listening Skills Development

In language learning, particularly in listening skills development, the integration of cognitive and emotional dimensions becomes increasingly important. Listening is not merely a passive reception of sounds; rather, it involves identifying key information, interpreting meaning, and responding appropriately to spoken messages.¹⁷ Recent studies in Computer-Assisted Language Learning (CALL) indicate that interactive video-based instruction enhances listening comprehension by providing visual context that clarifies spoken input.¹⁸

Nevertheless, many previous studies have primarily focused on students' perceptions or motivation without explicitly examining the mediating mechanism between cognitive processing, emotional engagement, and listening achievement.¹⁹ Furthermore, research at the senior high school level, particularly in the context of Arabic language learning, remains relatively limited.

Conceptual Framework

Based on the theoretical and empirical review presented above, this study proposes a conceptual model that integrates cognitive load management and emotional engagement into a systematic operational pathway.²⁰

Interactive video is positioned as the independent variable that influences cognitive processing through optimized cognitive load management. Effective cognitive processing subsequently enhances students' emotional engagement, which ultimately contributes to improved listening achievement.

¹⁷ Yueh-shian Lee, "Emotional Design in Multimedia Learning: Effects of Multidimensional Concept Maps and Animation on Affect and Learning" 14, no. 12 (2018).

¹⁸ Y.-L. Chen, C.-M., & Li, "Interactive Video-Based Learning for Improving Listening Comprehension. Computers & Education," 2022.

¹⁹ Phoebe Lin, "Developing an Intelligent Tool for Computer-Assisted Formulaic Language Learning from YouTube Videos" 34 (2022): 185–200, <https://doi.org/10.1017/S0958344021000252>.

²⁰ Z Wang, L Chen, and T Anderson, "A Framework for Interaction and Cognitive Engagement in Connectivist Learning Contexts," *International Review of Research in Open and Distance Learning* 15, no. 2 (2014): 121–41, <https://doi.org/10.19173/irrodl.v15i2.1709>.

Conceptually, the proposed relationship can be modeled as follows:



Figure 1. Conceptual framework

Within this model, emotional engagement functions as a mediating variable that bridges the influence of cognitive processing on listening performance. Thus, learning improvement is not conceptualized as a direct effect of media usage, but rather as the result of psychological mechanisms involving the interaction between cognitive and emotional dimensions.

This framework strengthens the theoretical coherence of the study and provides an operational foundation for empirical testing through a controlled experimental design.

Method

This study employed a mixed-method approach by integrating qualitative and quantitative procedures to obtain a comprehensive understanding of the research problem.²¹ In line with the framework proposed by Sugiyono, the qualitative phase was conducted at the initial stage to describe the instructional process and the implementation steps of cognitively and emotionally based interactive video media. Subsequently, the quantitative phase was carried out using a quasi-experimental non-equivalent control group design to examine the effectiveness of the instructional media.²²

The study was conducted at Senior High School 1 Blitar, East Java, Indonesia, with the population consisting of all tenth-grade students. The sample was selected through purposive sampling based on the equivalence of class characteristics. Class X-K (33 students) was assigned as the experimental group and received instruction using cognitively and emotionally based interactive video media, while class X-L (33 students) served as the control group and was taught using

²¹ John. Creswell, *Research Design Qualitative, Quantitative, and Mixed Method Approaches*, 2009.

²² C. Tashakkori, A. and Teddlie, "Handbook of Mixed Methods in Social & Behavioral Research.," 2010.

conventional instructional methods. In addition, class X-I (32 students) was used for instrument validity testing.

The independent variable was cognitively and emotionally based interactive video media, and the dependent variable was students' Arabic listening skill. Data were collected through listening tests (pretest and posttest), a Likert-scale questionnaire to measure students' perceptions and emotional engagement, and classroom documentation.

Instrument validity was established through content and construct validity, while reliability was tested using Cronbach's Alpha with a coefficient exceeding 0.70. Quantitative data were analyzed using descriptive statistics, the Shapiro–Wilk normality test, homogeneity testing, an independent samples *t*-test, and N-Gain analysis to determine the effectiveness of the interactive video media. Qualitative data were analyzed descriptively to support and enrich the interpretation of quantitative findings.

Result and Discussion

Learning Procedures of Cognitively and Emotionally Based Interactive Video in Enhancing Listening Skills

The teaching of listening skills in the experimental class was implemented through the application of cognitively and emotionally based interactive video, which was systematically designed to enhance students' listening ability. This instructional sequence aimed to optimize students' cognitive and emotional engagement through the presentation of contextual, visual, and auditory learning materials.

The learning process was conducted over five meetings, encompassing the measurement of students' initial listening ability (pretest), the delivery of vocabulary and conversation materials through interactive video, and the assessment of students' final listening ability (posttest). The instructional steps applied in the experimental class are presented in the following table.

Table 1. Learning activities in the experimental class

Meeting	Focus	Teacher's Activities	Students' Activities	Media
1 <i>Pretest</i>	Initial Listening Assessment	Administered a listening pretest using audio materials.	Listened to the audio and completed the pretest.	Audio, test sheets

2 <i>Vocabulary Video</i>	Vocabulary Development	Presented an interactive vocabulary video and guided pronunciation practice.	Watched the video, practiced pronunciation, and noted new vocabulary.	Interactive video
3 <i>Conversation 1</i>	Listening to Conversation	Played an interactive conversation video and facilitated role- play.	Listened to the dialogue and performed group role- play.	Interactive video
4 <i>Conversation 2</i>	Listening to Contextual Conversation	Presented a contextual conversation video and guided dialogue practice.	Listened, recorded key vocabulary, and practiced the dialogue.	Interactive video
5 <i>Posttest</i>	Final Listening Assessment	Administered a listening posttest using audio materials.	Listened to the audio and completed the posttest.	Audio, test sheets

Based on the table of learning activities in the experimental class, the implementation of cognitively and emotionally based interactive videos in listening skill instruction was conducted systematically through five instructional meetings. The learning sequence began with a pretest to measure students' initial listening ability, followed by the presentation of vocabulary and conversation materials through interactive videos, and concluded with a posttest to assess students' learning outcomes.

This instructional design aligns with Mayer's Cognitive Theory of Multimedia Learning,²³ which emphasizes that learning is more effective when verbal and visual information are presented simultaneously and meaningfully. The use of interactive videos enabled students to process Arabic listening materials through integrated visual

²³ Ruth Colvin Clark, Richard E. Mayer, and Will Thalheimer, "E-Learning and the Science of Instruction: Proven Guidelines for Consumers and Designers of Multimedia Learning," *Performance Improvement* 42, no. 5 (2003): 41–43, <https://doi.org/10.1002/pfi.4930420510>.

and auditory channels, thereby reducing cognitive overload and facilitating deeper comprehension.

Furthermore, the learning activities reflected the development of cognitive processes as described in Bloom's Taxonomy.²⁴ Students progressed from remembering and understanding vocabulary and expressions to applying and analyzing meaning within conversational contexts. Such progression indicates that interactive video-based instruction supports higher-order cognitive engagement in listening skill learning.

From an affective perspective, the inclusion of games, reflection sessions, and role-play activities fostered students' emotional involvement. This finding is consistent with Goleman's theory of emotional intelligence,²⁵ which highlights the role of motivation, emotional engagement, and social interaction in enhancing learning outcomes. Contextual and engaging video content helped create a positive learning atmosphere that increased students' attention and confidence.

In addition, the integration of conversation practice through listening and role-play activities corresponds with Brown's communicative language teaching principles,²⁶ which emphasize meaningful language use and contextualized input. Through interactive video-based listening activities, students were not only exposed to authentic language input but also encouraged to actively use the language in communicative situations.

Figure 2 illustrates the implementation of interactive video-based listening skill instruction in the experimental class. The figure depicts students' active engagement during listening activities, pronunciation practice, and guided conversation facilitated by the teacher.

As shown in Figure 3, students demonstrated a high level of attention and active participation throughout the learning process. Students were actively engaged in listening to the interactive videos, responding to teacher instructions, and participating in pronunciation and role-play activities. This indicates that the use of interactive video media successfully created an engaging and supportive learning environment.

²⁴ Mark Warschauer Michael Thomas, Hayo Reinders, *Contemporary Computer-Assisted Language Learning* (Bloomsbury Academic, 2012).

²⁵ Goleman, *Emotional Intelligence*, 1995.

²⁶ H. Douglas Brown, *Language Assessment Principles and Classroom Practices*, 2004.

This observation supports Mayer's multimedia learning theory,²⁷ which asserts that well-designed multimedia instruction enhances learners' ability to construct meaning by integrating visual and auditory information. The combination of dialogue audio and contextual visuals enabled students to comprehend spoken language more effectively.



Figure 2. Learning activities



Figure 3. Students' conversation practice activities

From the perspective of Bloom's Taxonomy,²⁸ the activities observed in the figure show that students were not passive recipients of information but actively processed and applied their listening skills in meaningful contexts. This demonstrates learning at higher cognitive levels, particularly in understanding and applying language input.

Moreover, students' enthusiasm and emotional engagement during the learning process align with Goleman's theory of emotional intelligence,²⁹ which emphasizes that positive emotions and motivation significantly influence learning success. The interactive and contextual

²⁷ Richard E. Mayer, *The Cambridge Handbook Of Multimedia Learning* (Cambridge University Press, 2005).

²⁸ Michael Thomas, Hayo Reinders, *Contemporary Computer-Assisted Language Learning*.

²⁹ Goleman, *Emotional Intelligence*.

nature of the videos contributed to students' emotional involvement and sustained attention.

Finally, consistent with Brown's communicative language teaching framework,³⁰ the use of interactive videos encouraged authentic language exposure and communicative practice. Listening activities were integrated with meaningful interaction, reinforcing students' communicative competence alongside their listening skills.

The Effectiveness of Cognitively and Emotionally Based Interactive Video in Enhancing Listening Skills

The validity test of the listening skill test instrument was conducted to determine the accuracy of each item in measuring students' listening ability. The instrument consisted of 35 test items and was administered to students of class X-I. Item validity was analyzed using the *Product Moment* correlation at a 5% significance level. An item was considered valid if the calculated correlation coefficient (r value) exceeded the r table value. The results of the item validity analysis are presented in the following table.

Table 2. Validity test of the *Mahārah Istima'* test instrument

Item Number	r value (calculated)	r value (table)	Remarks
1	0.607	0.349	Valid
2	0.462	0.349	Valid
3	0.378	0.349	Valid
4	0.581	0.349	Valid
5	0.445	0.349	Valid
6	0.351	0.349	Valid
7	0.469	0.349	Valid
8	0.355	0.349	Valid
9	0.595	0.349	Valid
10	0.354	0.349	Valid
11	0.515	0.349	Valid
12	0.395	0.349	Valid
13	0.425	0.349	Valid
14	0.439	0.349	Valid
15	0.355	0.349	Valid
16	0.357	0.349	Valid
17	0.509	0.349	Valid
18	0.533	0.349	Valid

³⁰ Brown, *Language Assessment Principles and Classroom Practices*.

19	0.438	0.349	Valid
20	0.394	0.349	Valid
21	0.416	0.349	Valid
22	0.365	0.349	Valid
23	0.410	0.349	Valid
24	0.397	0.349	Valid
25	0.476	0.349	Valid
26	0.400	0.349	Valid
27	0.361	0.349	Valid
28	0.601	0.349	Valid
29	0.415	0.349	Valid
30	0.366	0.349	Valid
31	0.726	0.349	Valid
32	0.750	0.349	Valid
33	0.702	0.349	Valid
34	0.749	0.349	Valid
35	0.649	0.349	Valid

Based on the results of the validity test presented in the table, all test items show calculated r values greater than the r table value of 0.349 at the 5% significance level. Therefore, all 35 items are declared valid and appropriate for use as an instrument to measure students' listening skill.

The reliability analysis of the listening skill test instrument yielded a Cronbach's Alpha coefficient of 0.886, indicating a high level of internal consistency. Therefore, the instrument was considered reliable for measuring students' listening achievement.

Reliability Statistics

Cronbach's Alpha	N of Items
.886	35

Figure 3. Reliability test instrument

Based on these results, it can be concluded that the listening skill test instrument has a very high level of reliability. Therefore, it is appropriate and trustworthy to be used as a data collection instrument in this study, both in the pretest and posttest stages.

The normality test was conducted as a prerequisite test before performing inferential statistical analysis. This test aimed to determine whether the posttest data of listening skill in the experimental and control classes were normally distributed. A normal data distribution is

one of the requirements for applying parametric statistical tests, particularly the *t-test*.

Tests of Normality

KELAS		Kolmogorov-Smirnov ^a			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
HASIL	Pretest Kontrol	.065	33	.200*	.978	33	.726
	Posttest Kontrol	.083	33	.200*	.977	33	.690
	Pretest Eksperimen	.069	33	.200*	.970	33	.494
	Posttest Eksperimen	.102	33	.200*	.968	33	.436

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Figure 4. Results of the normality test

Based on the results of the normality test presented in the figure above, the significance (Sig.) values of the posttest data in both the experimental and control classes are greater than 0.05. This indicates that the posttest data of both classes are normally distributed. Therefore, the data meet the requirements to proceed to the parametric statistical analysis stage.

Based on the results of Levene’s Test shown in Table 4.2, the significance values for all methods (mean, median, median with adjusted degrees of freedom, and trimmed mean) are greater than 0.05 (Sig. > 0.05). This indicates that the variances of learning outcomes between the groups are homogeneous. Therefore, the data meet one of the essential assumptions for conducting a *t-test* or a mean comparison test between the experimental and control classes.

Tests of Homogeneity of Variances

Hasil Belajar		Levene	df1	df2	Sig.
		Statistic			
	Based on Mean	2.942	1	64	.091
	Based on Median	2.840	1	64	.097
	Based on Median and with adjusted df	2.840	1	60.658	.097
	Based on trimmed mean	2.933	1	64	.092

Figure 5. Results of the homogeneity test

Based on the results of Levene’s Test shown in Table 4.2, the significance values for all methods (mean, median, median with adjusted degrees of freedom, and trimmed mean) are greater than 0.05 (Sig. > 0.05). This indicates that the variances of learning outcomes between the groups are homogeneous. Therefore, the data meet one of the essential assumptions for conducting a *t-test* or a mean comparison test between the experimental and control classes.

After confirming that the variances of learning outcomes between groups were homogeneous, the next step was to conduct an

independent samples *t-test* to determine whether there was a significant difference between the experimental class and the control class.

Before performing the *t-test*, descriptive statistics for each group were first presented, including the number of subjects (N), the mean of learning outcome scores (Mean), the standard deviation (Std. Deviation), and the standard error of the mean (Std. Error Mean). These statistics provide an initial overview of the differences in learning outcome scores between the two groups. The descriptive statistics are presented in:

Group Statistics

KELAS		N	Mean	Std. Deviation	Std. Error Mean
HASIL BELAJAR	KELOMPOK KONTROL	33	76.03	13.749	2.393
	KELOMPOK EKSPERIMEN	33	89.33	4.151	.723

Figure 5. Results of the t-test

Based on Figure 4. the experimental class shows a higher mean learning outcome score (M = 89.33, SD = 4.151) compared to the control class (M = 76.03, SD = 13.749). This indicates that learning through cognitively and emotionally based interactive videos has the potential to improve students' learning outcomes.

In addition, the variability of scores in the control class is greater (SD = 13.749) than in the experimental class (SD = 4.151), indicating that students' learning outcomes in the control class are more diverse, whereas the learning outcomes in the experimental class are relatively more consistent around the mean. This mean difference is further analyzed using an independent samples *t-test* to determine whether the difference is statistically significant, thereby allowing conclusions to be drawn regarding the effectiveness of the learning method applied in the experimental class.

To determine the effectiveness of the learning method in improving students' learning outcomes, the N-gain (%) was used as a measure of students' ability growth from before to after the treatment.

Before conducting a comparison of the mean N-gain between groups, descriptive statistics for each class were first presented, including the mean, standard deviation (Std. Deviation), median, minimum and maximum values, as well as range and skewness/kurtosis. These statistics provide an initial overview of the improvement in students' learning outcomes in each group. The descriptive statistics of N-gain are presented in the figure.

Based on the figure, the experimental class shows a much higher improvement in learning outcomes compared to the control class. The

mean N-gain of the experimental class is 80.62%, while that of the control class is only 22.17%. This indicates that students in the experimental class experienced a significant growth in ability, whereas the improvement in the control class is categorized as low.

In addition, the variability of N-gain in the experimental class (SD = 5.081) is greater than that in the control class (SD = 1.465), indicating that although most students experienced high improvement, there were greater individual differences in the experimental class. The skewness and kurtosis values of both groups indicate that the data distribution is approximately normal, thus fulfilling the assumptions for statistical analysis.

Descriptives				Statistic	Std. Error		
ngain_persen	Kelas						
ngain_persen	Kontrol	Mean		22.1712	.25495		
		95% Confidence Interval for Mean	Lower Bound	21.6519			
			Upper Bound	22.6905			
		5% Trimmed Mean		22.2025			
		Median		22.2222			
		Variance		2.145			
		Std. Deviation		1.46455			
		Minimum		19.15			
		Maximum		24.53			
		Range		5.38			
		Interquartile Range		2.19			
		Skewness		-.374	.409		
		Kurtosis		-.673	.798		
		ngain_persen	Eksperimen	Mean		80.6151	.88442
				95% Confidence Interval for Mean	Lower Bound	78.8136	
					Upper Bound	82.4166	
5% Trimmed Mean				80.4939			
Median				80.0000			
Variance				25.813			
Std. Deviation				5.08062			
Minimum				72.31			
Maximum				91.43			
Range				19.12			
Interquartile Range				8.40			
Skewness				.303	.409		
Kurtosis				-.757	.798		

Figure 6. Results of the n-gain test

These results further strengthen the previous findings that the use of cognitively and emotionally based interactive videos is effective in significantly improving students' learning outcomes compared to conventional teaching methods.

The findings of this study indicate that the use of cognitively and emotionally based interactive videos significantly improved students' listening skills compared to conventional instruction. This improvement is evidenced by the higher posttest mean score and the substantial N-gain percentage observed in the experimental class. From

the perspective of Mayer's Multimedia Learning Theory, the integration of auditory and visual information facilitated dual channel processing and supported the management of cognitive load.³¹ Through segmentation, visual cues, and structured navigation, the interactive videos reduced extraneous cognitive load and enhanced germane processing, enabling students to organize and integrate spoken input more effectively.

However, cognitive optimization alone does not fully account for the improvement in listening performance. The emotional elements embedded in the interactive videos such as contextualized narratives, engaging visuals, and immediate feedback likely enhanced students' emotional engagement, including motivation, sustained attention, and reduced anxiety. Drawing on Goleman's Emotional Intelligence Theory,³² emotional regulation and intrinsic motivation play a crucial role in sustaining cognitive effort during complex tasks such as listening comprehension. In this study, emotional engagement appears to function as a mediating variable between cognitive processing and listening achievement. When students experience positive learning emotions, their attentional resources increase, thereby strengthening information processing and retention. Recent educational research similarly suggests that emotional engagement serves as a pathway linking instructional design and academic performance.³³

In addition, consistent with Bloom's hierarchical cognitive framework³⁴ and Brown's theory of second language acquisition,³⁵ meaningful and emotionally supportive input enhances both comprehension and learner confidence. The interactive videos provided authentic listening materials within a supportive multimedia environment, which may have reduced affective barriers and facilitated deeper processing of linguistic input.

Nevertheless, several internal validity considerations should be acknowledged. Because this study employed a quasi-experimental non-equivalent control group design, potential selection bias and

³¹ Mayer, *The Cambridge Handbook Of Multimedia Learning*.

³² Goleman, *Emotional Intelligence*.

³³ K. Pekrun, R., & Loderer, "Emotions and Learning from Multiple Representations and Perspectives.," 2020, (pp. 373–400). Routledge/Taylor & Francis Group., <https://doi.org/https://doi.org/10.4324/9780429443961-25>.

³⁴ D. R. Anderson, L. W., & Krathwohl, "A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives;," *Complete Edition*. New York: (2001).

³⁵ H Douglas Brown, *Principles Of Language Learning and Teaching*, n.d.

uncontrolled contextual variables cannot be entirely ruled out. Although efforts were made to ensure comparable instructional conditions, differences in prior ability or classroom dynamics may have influenced the results. Future research employing randomized controlled designs and larger samples would strengthen causal inference.

Compared with previous studies on interactive video in language learning, which often focused primarily on student perceptions or motivation, this study contributes by empirically examining listening performance outcomes and proposing an integrated cognitive emotional mechanism. Thus, the theoretical contribution of this research lies in modeling the pathway: Interactive Video, Cognitive Processing, Emotional Engagement, Listening Achievement. By conceptualizing emotional engagement as a mediating variable rather than merely an accompanying factor, this study advances the theoretical coherence of multimedia assisted listening instruction at the senior secondary level.

The novelty of this study lies in the explicit integration of cognitive load optimization and emotional engagement within a single instructional medium, operationalized through cognitively and emotionally based interactive video.³⁶ Unlike prior studies that treat interactivity as a purely technical feature, this research conceptualizes interactive video as a dual-mechanism pedagogical tool that simultaneously structures information processing and regulates affective states.

Furthermore, the study advances Arabic language pedagogy by positioning emotional engagement as a mediating variable rather than a supplementary factor. The incorporation of contextual narratives, interactive prompts, and immediate feedback fosters motivation and attentional control, which are essential in processing authentic spoken Arabic input. This aligns with affective filter hypotheses and communicative language teaching principles, where reduced anxiety and increased engagement facilitate language acquisition and listening comprehension.³⁷ In this sense, the developed product reflects a theoretically grounded innovation that bridges cognitive and affective

³⁶ John Sweller, "Cognitive Load Theory and Educational Technology," *Educational Technology Research and Development* 68, no. 1 (2020): 1–16, <https://doi.org/https://doi.org/10.1007/s11423-019-09701-3>.

³⁷ Goleman, *Emotional Intelligence*, Brown, *Language Assessment Principles and Classroom Practices*.

domains, contributing to a more holistic model of maharah istimā' development in secondary education contexts.

Conclusion

Based on the findings, this study concludes that the implementation of cognitively and emotionally based interactive video is an effective instructional approach for improving students' Arabic listening skills at Senior High School 1 Blitar. The results demonstrate that integrating cognitive processing and emotional engagement into instructional design leads to significantly better listening performance compared to conventional methods. Conceptually, this study supports the argument that language learning success is shaped not only by cognitive factors but also by affective dimensions such as motivation, attention, and emotional involvement. By modeling the pathway linking interactive video, cognitive optimization, emotional engagement, and listening achievement, this research contributes to strengthening the theoretical foundation of multimedia-assisted language learning.

However, several methodological limitations must be acknowledged. The use of a quasi-experimental non-equivalent control group design limits full control over potential selection bias and contextual classroom variables. The sample was drawn from a single institution, which restricts the generalizability of the findings. In addition, the relatively short duration of implementation and the focus on a single language skill may not fully capture long-term instructional effects. Therefore, future studies are recommended to conduct multi-site replication with larger and more diverse samples, longer intervention periods, and randomized experimental designs in order to enhance external validity and strengthen causal conclusions.

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