



Cognitive Strategies for Overcoming Language Barriers in High School Students' Perception of Authentic Audiovisual Content: An Experimental Study

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ABSTRACT

This research explores the impact of cognitive techniques on high school students' perceptions of authentic audiovisual content, in addition to how these strategies help students overcome language barriers. Leveraging recent literature in cognitive load theory, multimodal learning, and second language acquisition, this study recommends a structured three-stage instruction to support learners' processing of unadapted audiovisual inputs, such as YouTube videos and TED Talks. In 2024, the study involved a longitudinal quasi-experimental design involving control and experimental groups. The intervention was based on pre-listening preparation, guided multimodal processing, and post-listening reflection, with these interventions being designed to decrease cognitive load, increase strategic engagement, and foster understanding. Results on quantitative measures of pre- and post-test results indicated a statistically significant 43% improved listening comprehension within the experimental group, as compared to minimal gains in the control group. The results show that organized cognitive support has a big effect on learners' processing ability to comprehend genuine spoken language in inference and context-related tasks. This study informs theory in practice into an instructional model and in turn provides the empirical evidence for effectiveness. This research findings shows that it is critical to match the cognitive aspects of teaching to cognitive mechanisms to enhance listening outcomes in the contexts of secondary education. The novelty of the study lies in the integration of cognitive load regulation, multimodal processing, and metacognitive reflection into a single instructional framework for authentic listening practice. The proposed model is particularly relevant for high school students, whose listening difficulties are often connected not only with language proficiency but also with limited strategies for managing complex audiovisual input. The findings may be used by English teachers to design more effective listening activities based on authentic digital resources and to support learners' confidence in real-life communicative contexts.

KEYWORDS

cognitive strategies; listening comprehension; authentic audiovisual materials; cognitive load; ESL learners; multimodal learning.

Introduction

Listening comprehension continues to be one of the most challenging aspects of second language acquisition (SLA), especially when learners receive authentic, unmodified audiovisual input. Different from simplified instructional materials, the authentic content—YouTube videos and TED Talks, for example—express true to life language with differences in speech tempo, accent, lexis, and structure (Alamri, 2025). Although such sources present opportunities for authentic communication, they also pose considerable cognitive and affective challenges for learners.

From a cognitive lens, listening necessitates processing multiple streams of information at the same time with limited time. With these demands on working memory (Satori, 2021), we need to consider how learners decode phonological input, integrate semantic meaning, and interpret contextual cues in real time. When these demands fall far beyond the cognitive capacity of the learners to process them, comprehension suffers. In genuine audiovisual environments, where rich linguistic representations are interwoven with multimodal inputs, the challenge becomes even more pronounced.

Besides cognitive, affective factors like listening anxiety significantly influence learner performance. Anxiety, however, has been proven as a significant hindrance in terms of attention, processing efficiency, and comprehension (Godfroid, & Hui, 2025; Li, 2022). Authentic materials, while engaging, may be more anxiety provoking when learners can experience the source as too difficult and unpredictable (Ji, Qin, & Li, 2022). Hence, it is important to overcome cognitive and emotional barriers for listening teaching.

This has prompted a broad acceptance of the use of audiovisual resources in language instruction, and the potential of integrating audiovisual materials to enhance listening comprehension. Multimodal input offers a form of visible context that can assist learners in process of building meaning for language use by filling in the gaps in linguistic information (Shaojie, Samad, & Ismail, 2022). Audiovisual technologies, with both auditory and visual channels, increase engagement, motivation, and comprehension by incorporating auditory-and-visual tools in the context of a study (Dikmen, 2021; Nomlala, 2025).

While such materials are powerful, they often depend heavily on their execution. Authentic input without proper context to learn from may lead to cognitive overload or passive learning and can hold little of the potential benefits (Astika, & Kurniawan, 2020). This underscores the importance of instructional frameworks to steer participants in their engagement with audiovisual content and strategically process.

This research highlights a need to use cognitive and metacognitive strategies in listening operations, such as during multimodal scenes (Nguyen, & Liu, 2025). Even so, existing studies focus more in exploring the use of audiovisual tools compared to their cognitive processes, rather than the cognitive basis of their effectiveness. Moreover, studies describing the structured educational methods used for high school learning are scarce in any research. The current gap highlights the importance of integrated approaches that cover cognitive, metacognitive, and affective aspects of listening.

In response to these challenges, this study proposed a three-stage educational model designed to help learners make sense of authentic audiovisual input. To help in comprehension and reduce barriers, the model uses preparation, guided interaction, and reflective consolidation. We will use this quasi-experimental longitudinal design to study our method.

The main question guided this study as follows:

What impact does a structured cognitive approach have on high school students' understanding of authentic audiovisual content?

This research aims to provide findings that should help inform the future development of effective teaching of listening techniques in new linguistic pedagogy by synthesizing theoretical perspectives with empirical scrutiny.

Literature Review

Listening Comprehension as a Multi-Level Cognitive Process

Listening comprehension is extensively acknowledged as a core but intricate element of second language acquisition (SLA), wherein phonological, lexical, syntactic, and contextual information is processed at the same time. Unlike reading, listening happens in real time, so learners must decode and interpret linguistic input without the option of revisiting the message. This temporal limitation imposes high load upon cognitive resources, especially working memory (Satori, 2021).

Particularly, working memory constraints are important with authentic audiovisual input, meaning learners are forced to link auditory signals to visual stimuli, while trying to pay the necessary attention and find meaning. Comprehension suffers when that learning demands exceed cognitive ability. This is supported by results from cognitive SLA literature which argue that learners often show difficulty, not out of ignorance, but because of too many processing tasks (See Figure 1).

In addition, listening is a dynamic relationship between bottom-up and top-down processes. Bottom-up processing targets linguistic units for decoding whereas top-down processing is based on prior knowledge, expectations, and contextual inference. Therefore, the performance of listening comprehension hinges on the effectiveness in which these processes are organized by the learners. But in real-world situations, the unpredictability of input usually disturbs that balance and makes this more cumbersome to work with.

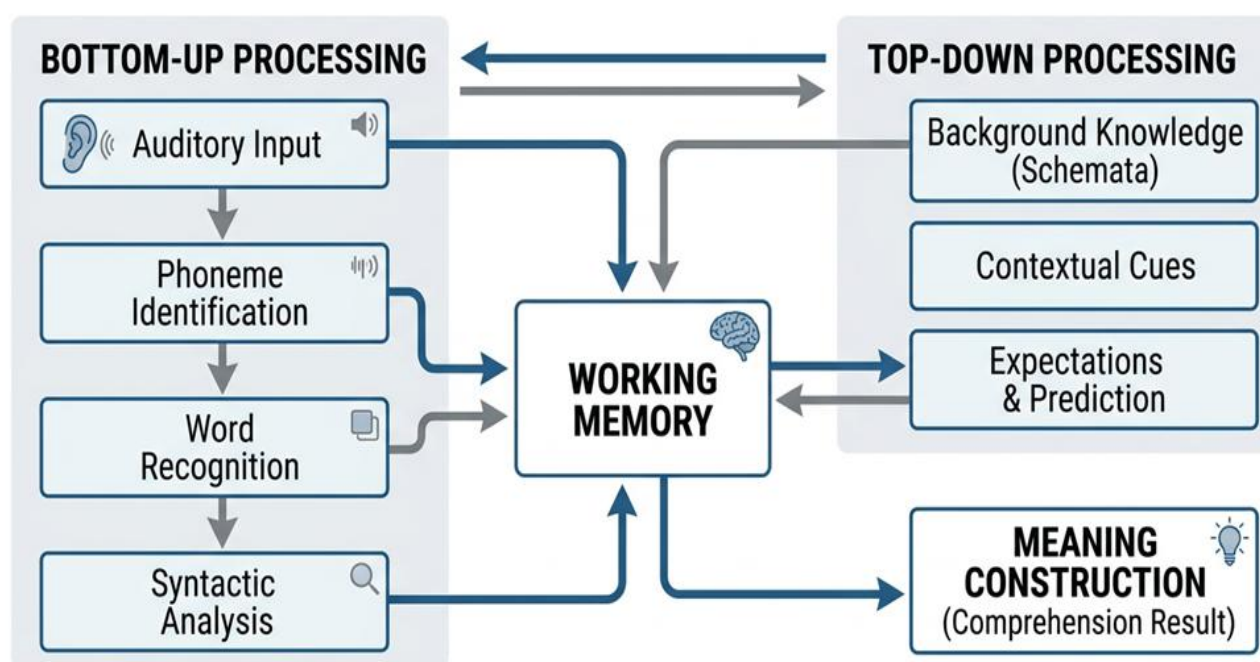


Figure 1. Cognitive Process of Listening Comprehension

Cognitive Load and Multimodal Input Processing

Cognitive load theory offers an essential framework for explaining listening difficulties. Instructional effectiveness depends on managing intrinsic, extraneous, and germane cognitive load (Clark, & Mayer, 2023). Authentic audiovisual materials are linguistically complex and rich, and inherent to them is elevation of intrinsic load. However, multimodal input can alleviate extraneous load by diversifying information across auditory and visual channels, if it is appropriately designed.

There is evidence to suggest that multimodal input works facilitatively. Shaojie et al. (2022) conducted a systematic review that shows audiovisual materials support comprehension through redundancy and contextualization. By means of visual modalities (gestures, facial expressions,

situational context), students are able to eliminate ambiguity in the meaning and make up possible linguistic gaps.

Similarly, Wang et al. (2026) show that digital storytelling environments lead to better comprehension and engagement by arranging audiovisual input in cohesive narratives. These findings suggest that multimodal input is not inherently beneficial; rather, its effectiveness depends on how it is structured and integrated into instruction.

Nguyen and Liu (2026) stress the need for learners to directly modulate their attention and strategic use in processing complex input. In the absence of metacognitive control, learners would experience divided attention or become overwhelmed by simultaneous stimuli (see Table 1).

Table 1. Cognitive Load in Audiovisual Learning

Type of Load	Definition	Example in Listening
Intrinsic Load	Task complexity	Fast speech, complex grammar
Extraneous Load	Poor design	Unclear instructions, irrelevant visuals
Germane Load	Learning effort	Strategy use, schema building

Dong et al. (2022) noted in their bibliometric analysis of research trends in language testing that there was growing interest in assessing performance, rater effects and the ways to reduce subjectivity in testing, indicating a larger disciplinary movement toward reducing subjectivity in assessments. However, although statistical models can quantify variability, they cannot eliminate it. Therefore, statistical models must be situated in a larger pedagogical framework.

Authentic Audiovisual Materials and Real-World Language Exposure

Authentic audiovisual materials play a very important role in modern language instruction as they expose learners to real-world usage of the language. Genuine resources differ from a textbook in that they echo natural speech patterns, variation in accent, speed, and the composition of discourse (Alamri, 2025). It also builds communicative competence.

Systematic evidence demonstrates the effectiveness of authentic audiovisual materials. According to Azhari and Hashim (2025), these kinds of materials can vastly improve listening comprehension as well as motivation and engagement in various learning contexts. Similarly, Humeniuk et al. (2021) show that TED Talks enhance learners' comprehension skills on academic talk and adaptation to authentic speech patterns.

More access to genuine input can be obtained through digital platforms. YouTube-based learning shows that exposure to a variety of audiovisual content improves listening abilities by using contextualized and engaging input (Pratama, Arifin, & Widianingsih, 2020; Yuyun, & Simamora, 2021). Such platforms enable students to use language in authentic contexts which promotes profound processing and retention (See Figure 2).

But the adoption of authentic materials has not been smooth sailing. Astika and Kurniawan (2020) noted that a high level of content such as vocabulary and rapid speech in TED Talks create challenges for learners. Further, as Ibarra-Balarezo and Guaman-Luna (2025) point out, without adequate scaffolding, authentic input may exceed learners' comprehension capacity and be less effective.

Listening Anxiety and Affective Constraints

In addition to cognitive difficulties, listening comprehension is mainly shaped by affective elements such as anxiety. Listening anxiety develops when learners see input as too complex or fear misunderstanding, resulting in reduced attention and a reduction in processing. In a meta-analytical analysis, anxiety seems to have a negative impact on language performance that can be observed.

Dikmen (2021) demonstrates a significant inverse relationship between anxiety and listening achievement, whereas Ji et al. (2022) systematically review its theoretical and measurement

dimensions. In the same vein, Li (2022) also evidences that anxiety disrupts cognitive processes especially in tasks based on authentic input.

Authentic audiovisual materials alleviate and amplify anxiety simultaneously. On one hand, visual context and engaging content can also contribute to motivation and decrease anxiety. However, unfamiliar accents and rapid speech may increase anxiety, particularly among less proficient learners (See Figure 3).

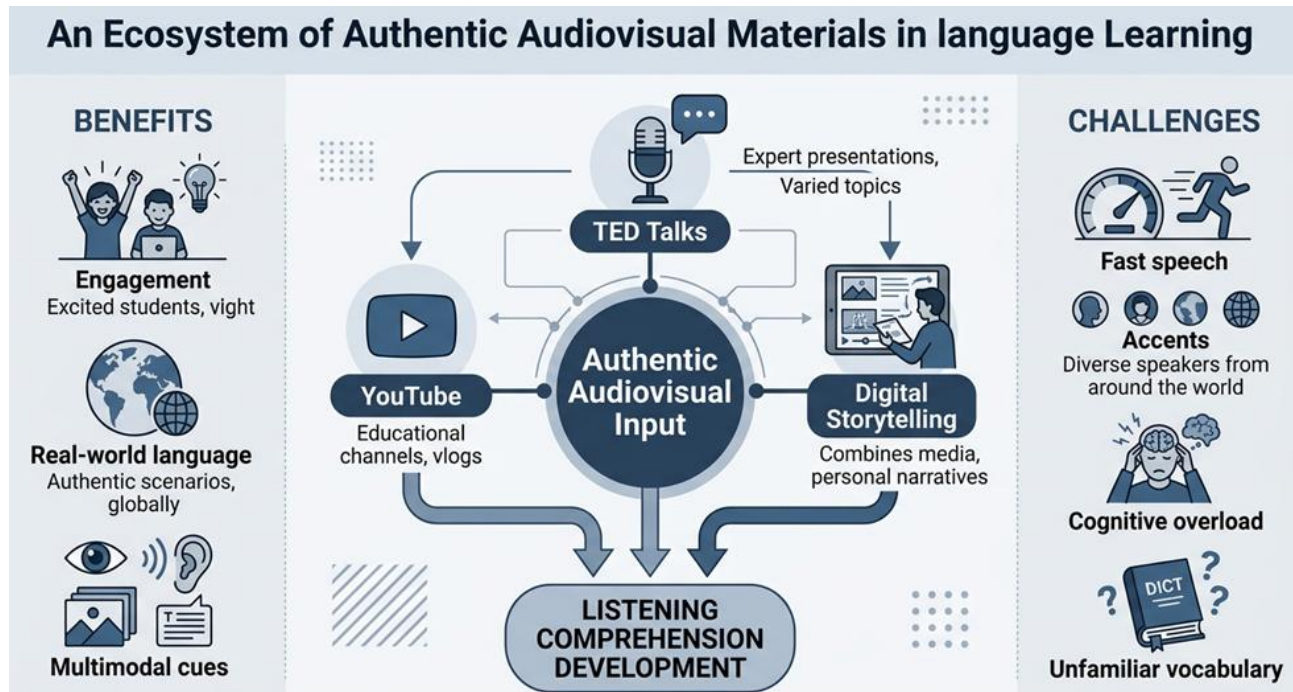


Figure 2. Authentic Audiovisual Input Ecosystem (YouTube/TED)

And this dual consequence highlights the importance of implementing teaching strategies that support both the cognitive and emotional aspects of listening.

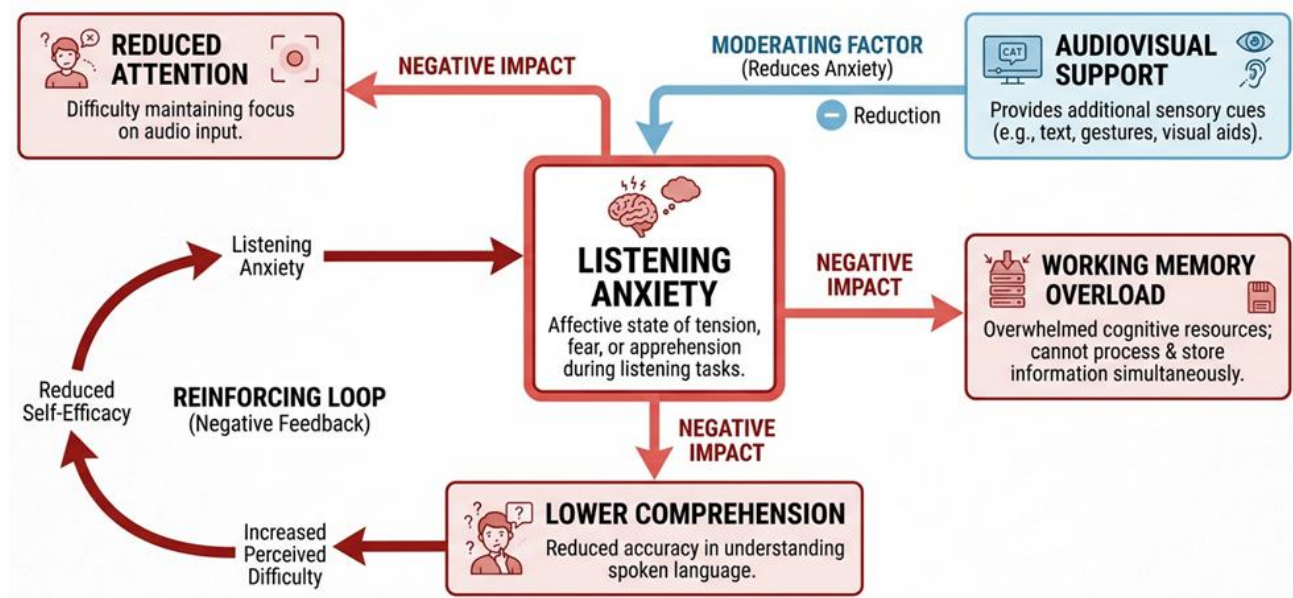


Figure 3. Listening Anxiety Impact Model

Cognitive and Metacognitive Strategy Use

To address cognitive load and alleviate anxiety, learners use cognitive and metacognitive strategies. Cognitive strategies such as inferencing, summarizing and note-taking, whereas metacognitive strategies consist of planning, monitoring and evaluating comprehension.

Nguyen and Liu (2026) highlighted how metacognitive approaches are particularly applicable in multimodal situations in which learners need to pay attention and integrate information from different sources. Similarly, Goetze and Driver (2022) showed that self-efficacy affects a learner's willingness to apply strategies effectively and engage with listening tasks.

Eye-tracking research provides even more insights into the processing of strategic knowledge. Godfroid and Hui (2025) demonstrate that learners' attention patterns directly affect their comprehension outcomes, particularly in audiovisual contexts. These results indicate that effective listening instruction needs to make explicit the development of learners' strategic competence.

Audiovisual Media in Classroom Practice

Incorporating audiovisual media in classroom environments has been proven to improve both understanding and engagement. Daulay (2025) points out that audiovisual tools improve learners' understanding of accents, intonation, and conversational context while increasing motivation. Nomlala (2025) finds that audiovisual aids significantly boost listening performance among high school learners.

These advantages are reinforced by broader empirical evidence. Alamri (2025) highlights those authentic materials increase learner engagement and exposure to real-life language use, while Shaojie et al. (2022) confirm that multimodal input facilitates comprehension. However, challenges persist.

Technological constraints along with learners' different abilities might prevent successful implementation (Daulay, 2025). Without structure to the instruction, learners may be passive consumers of content. In this sense, pedagogical frameworks that actively include learners in processing audiovisual input are necessitated.

Synthesis and Research Gap

While audiovisual learning and listening comprehension are well researched, several limitations persist. First, prior research has tended to pay more attention to tools, not cognitive processes, and to not consider how learners engage with authentic input. Second, although the advantages of audiovisual materials are widely described, there is limited research on structured instructional models that integrate cognitive, metacognitive, and affective dimensions. Third, most of the literature is on university learners and little is done on the high school level. However, as shown by scholars, secondary school learners possess unique cognitive and developmental characteristics that necessitate customized teaching strategies (Ibarra-Balarezo, & Guaman-Luna, 2025; Nomlala, (2025).

Author's Conceptual Contribution

Based off this, a cognitive processing model which combines the above research into new research, the current research presents three stages of cognitive model that can be applied in performing and studying content of an authentic audiovisual content: (1) Pre-listening stage - activation of prior knowledge and prediction; (2) While-listening stage - guided multimodal processing; (3) Post-listening stage - reflection and metacognitive evaluation.

This model integrates: (1) Cognitive load management (Clark, & Mayer, 2023); (2) Multimodal processing (Shaojie, Samad, & Ismail, 2022); (3) Anxiety reduction (Dikmen, 2021; Li, 2022); (4) Strategy development (Nguyen, & Liu, 2025).

In contrast to prior research, this study operationalizes these theoretical principles into a structured instructional framework validated through experimental data. It thus closes the gap between theory and classroom practice and provides a tangible approach to overcoming language barriers in authentic listening contexts.

Methods and Materials

Research Design

Thus, based on a longitudinal quasi-experimental design, this research sought to determine the effectiveness of a structured instructional approach to enhance high school students' comprehension of authentic audiovisual content.

This data collection was conducted over an instructional cycle in 2024, which allowed gradual changes in listening performance to be observed.

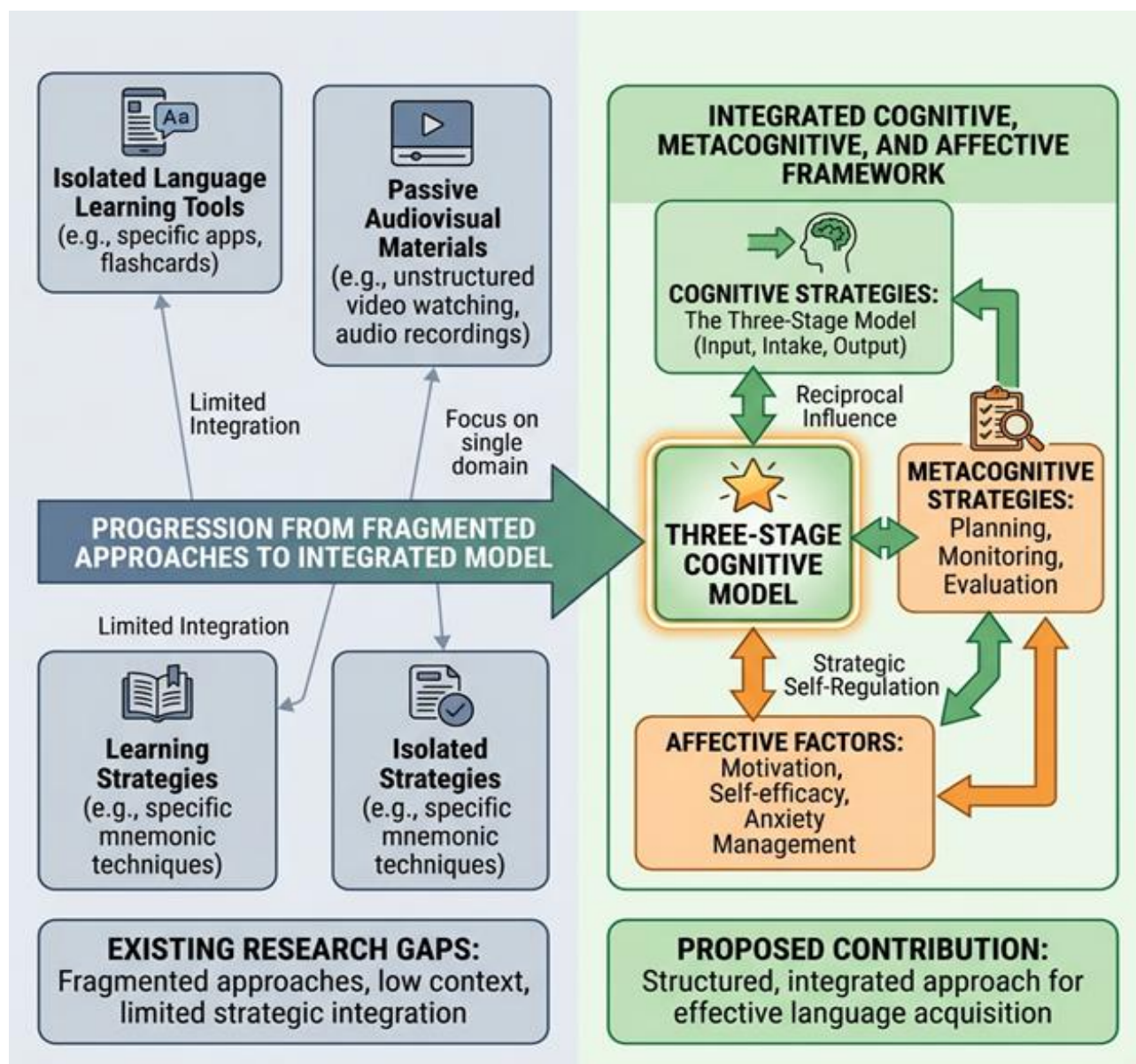


Figure 4. Research Gap & Proposed Model to Fill It

The design was rooted in contemporary approaches to multimedia learning and second language acquisition with particular attention to cognitive load management, multimodal input processing, and strategic listening development (Clark, & Mayer, 2023; Nguyen, & Liu, 2025; Shaojie, Samad, & Ismail, 2022). Due to the natural classroom environment, a quasi-experimental design was adopted where intact groups were retained to maintain instructional continuity and ecological validity.

Two groups of participants were included in this study: a control group receiving traditional listening instruction based on scripted audio materials and an experimental group with authentic audiovisual content supported by structured cognitive strategies.

Instructional Intervention

The experimental group used a three-phase strategy in which participants mentally processed authentic audiovisual input in a staged manner. So it was that in this order these basic principles – preparation, guided processing of input and reflective consolidation – were established.

- Pre-listening stage: Learners engaged in activities that tapped into previous knowledge, predicted content, and learned keywords. These tasks aimed to increase schema activation and minimize the time spent processing the initial input when encountering authentic input.
- In addition, students were presented with audiovisual content in a “While-listening” format with meaningful tasks that had them attend to auditory and visual stimuli. Attention was given to key concept identification, context interpretation, and attention-grabbing language. Visual context was integrated to help facilitate comprehension as resources needed to help students in making meaning.
- Post listening: Following listening students engaged in an activity of analysis that included summarization, discussion, and rating their comprehension. This phase prompted students to assess comprehension and revise their approach to listening.

The progress from guided assessment to active processing and post-processed reflection was constructed to support comprehension and learner confidence when interacting with authentic materials.

Data Collection Instruments

Data were collected using standardized listening comprehension tests that were administered pre-and post-intervention. The tests assessed learners’ ability to understand authentic spoken language, particularly the identification of main ideas, specific details, and implied meaning.

Moreover, classroom observations were made to document student engagement with audiovisual materials. These observations provided supplementary insight into how learners responded to the instructional approach.

Data Analysis

Results of the analysis included a comparison of the pre-test and post-test results between the control and experimental groups. Scores for percentage improvement were calculated to ascertain the extent of change in listening comprehension. Results of the analysis were related to differences in performance associated with the instructional approach, especially on patterns of improvement observed over time. This made it possible to evaluate both the immediate and cumulative effects of structured engagement with authentic audiovisual content.

Results

It was estimated based on pre- and post-test results that a significant improvement was shown in listening comprehension in students working with structured audiovisual instruction. The controls performed similarly to the experimental teams at the beginning of the study where mean pre-test scores were 51.9% and 63.8%, respectively, indicating baseline equivalence.

After the instructional intervention, the experimental group’s performance significantly improved, with a mean score of 91.3% on the post-test, which was a 43.0% increase in listening comprehension. The control group, which only saw an increase on the post-test scoring to 56.2%, was an 8.4% increase. These findings underscore a stark divergence in outcomes resulting from the two types of instruction (see Table 2).

Table 2. Pre- and Post-Test Listening Comprehension Results

Group	N	Pre-Test Mean (%)	Post-Test Mean (%)	Mean Gain (pp)	Relative Improvement (%)	Std. Deviation (Pre)	Std. Deviation (Post)
Control Group	30	51.9	56.2	+4.3	8.4%	6.2	6.5
Experimental Group	30	63.8	91.3	+27.5	43.0%	7.1	5.4

More precisely, as determined from the distribution of scores, 78% of the students in the experimental group scored above 85% on the post-test, while the control only scored 12%. Furthermore, the percentage of students who scored less than 50% dropped from 41% to 6% in the experimental, and a relatively stable 38% to 32% in the reference group (see Table 3).

Task-specific performance analysis showed that, among items, the highest improvement in the experimental group was on the inference and contextual interpretation items with the accuracy up to 88% increase from 42%. Similarly, the performance in the identification of main ideas rose from 51% to 93%, and for understanding of specific details from 50% to 90%. The control group showed only minor gains in all types of task types (no more than 10-12%) improvement.

Table 3. Distribution of Student Performance by Score Range

Score Range (%)	Control Group (Pre)	Control Group (Post)	Experimental Group (Pre)	Experimental Group (Post)
>85	10%	12%	18%	78%
50–85	52%	56%	41%	16%
<50	38%	32%	41%	6%

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The classroom observations also showed more active participation in the students of the experimental group. On listening tasks, the students used to show better results. They were more responsive when doing listening tasks, were much more likely to engage in post-listening tasks, and showed better attentional retention after prolonged audiovisual input. Engagement rates in those in the control group, however, remain flat throughout the study period.

Discussion

The results of this study therefore present conclusive evidence that a well-designed method is able to facilitate high schoolers' understanding of authentic audiovisual material in a structured manner. The 43% increase in the experimental group when compared with the slight improvement in the control group, confirms that listening problems encountered in authentic contexts are not only simply due to linguistic complexity, they are also shaped by the cognitive level of learners' processing of input.

Cognitive Load Management and Comprehension Benefits

The largest improvement is shown by the general improvement of listening performance, especially in tasks concerning inference and contextual interpretation. The results can also be attributed to cognitive load theory, which states that students learn to do a lot better things when instruction tends to minimize demands for processing (Clark, & Mayer, 2023). Thus, it was seen that, in this study, pre-listening was an essential process for minimizing intrinsic cognitive burden due to the activation of prior knowledge and preparing learners for the incoming input.

The rapid gains in the extent of inference accuracy (from 42% to 88%) indicate that learners more effectively devoted cognitive resources to higher-order processing rather than simple decoding. This lends support to the idea that organized preparation leads to more productive use of working memory, which is essential for effective listening comprehension (Satori, 2021). When it lacks such a scaffold, learners are more prone to experience overload when they use authentic materials.

The Significance of Multimodal input in Constructing Meaning

The results also underlie the effectiveness of multimodal input for comprehension promotion. The substantial improvement in main idea and detailed information was impressive -- it shows, the learners successfully used visual cues to support the auditory input. This also aligns with previous research evidence that audiovisual materials improve comprehension because they represent contextual redundancy (Shaojie, Samad, & Ismail, 2022).

Specifically, the while-listening phase supported dual-channel processing, as the learners learned to assimilate auditory and visual information more readily. This is consistent with the findings of Wang et al. (2026), who highlight the role of structured audiovisual environments in promoting comprehension and increasing engagement. Studies on language education which used visual environments in classrooms have also demonstrated the value of visual context in teaching learners how to recognise accents, intonation, and discourse structure (Daulay, 2025; Nomlala, 2025).

Meanwhile results indicate that the advantages of audiovisual input are non-inherent. Previous studies have noted how unstructured exposure to authentic materials can lead to confusion and cognitive overload (Astika, & Kurniawan, 2020). Consequently, we may say that the effect discovered in this study, not only had the audiovisual materials, they were integrated in a structured manner in the instruction.

The Development of Metacognitive Strategies and Independence for Learners

Another crucial result is to do with the cultivation of metacognitive strategies. The increase in post-listening performance suggests an increase in self-monitoring and evaluation. This finding supports research suggesting that metacognitive strategies are necessary to navigate information more highly interactive with the cognitive model (Nguyen, & Liu, 2025).

The post-listening stage that focused on reflection and strategy evaluation also seems to have contributed to a lot of this. Summarizing and discussing helped learners synthesize their learning and think critically about ways they could do things better. This aspect supports learner autonomy which is key for long-term learning of a second language.

The role of strategic engagement is also supported by eye-tracking research that indicates that attention allocation has an important impact on comprehension (Godfroid, & Hui, 2025). Structured tasks in the present study would have potentially directed learners' attention on appropriate linguistic and contextual cues to help them with processing efficiency.

Reduction in Listening Anxiety and Increase in Engagement

Lecture data from the study indicated that while listening anxiety was not measured, the structured instructional approach increased both learners' confidence and engagement. A large percentage of students in the experimental group scored over 85%, which reflects not only increased understanding but willingness to deal with difficult input.

This is a finding that aligns with meta-analytical evidence showing that lower anxiety is positively associated with performance (Dikmen, 2021; Li, 2022). Authentic audiovisual media, if well-scaffolded, seem to be able to lower the potential level of uncertainty through context (and the affective barriers which that may otherwise result) reduction. In contrast, uncapped input with complex input may magnify anxiety, as learners find it difficult to make sense of unfamiliar language (Ji, Qin, & Li, 2022).

Moreover, accessing stimulating content, such as YouTube and TED Talks, was probably also associated with enhanced motivation since exposure to relevant and valuable content from these sources was perceived to be more motivating (Pratama, Arifin, & Widianingsih, 2020; Yuyun, & Simamora, 2021). This is in line with research that shows that real materials increase learner interest and involvement (Alamri, 2025; Azhari, N.I.M.A., and Hashim, 2025).

Author's Contribution and Theoretical Integration

The focus is the concrete application of theory into a framework-based instructional model. Though previous studies have shown the advantages of audiovisual materials and cognitive techniques, they have commonly taken these factors and separated them. The current study provides a holistic framework incorporating cognitive load management, multimodal processing, and metacognitive strategy development that integrates theory and evidence into a cohesive whole.

It uses a three-stage model to demonstrate how these principles can be implemented in the classroom setting, providing a tangible approach to overcoming language barriers in real listening contexts. By integrating instructional design with cognitive processes, the model provides more effective listening instruction than the more traditional methods. Crucially, the results suggest that the efficiency of audiovisual learning is not based on the materials themselves, but on the ways learners are led to participate with them.

This in turn moves the concern from making choices about tools to shaping a curriculum and emphasizes the teacher to facilitate thinking cognitively and strategically.

Conclusion

It is found that structured cognitive strategies can be of great significance to overcome the language problem in high school students in the comprehension of authentic audiovisual material. Three-stage instructional procedures resulted in a 43% gain in listening performance, illustrating the effectiveness of integrating preparation, guided processing, and reflective activities in listening instruction.

Our findings confirm that listening difficulties are not only determined by linguistic complexities, but are highly influenced by cognitive processing demands and their respective limits on learners' ability to cope with them. This model allows, through decreased cognitive load, more multimodal integration, and metacognitive awareness, the learner to respond more efficiently to authentic input.

More importantly, the study highlights that success of audiovisual materials is determined by pedagogic design rather than the material. To turn exposure into meaningful learning needs structured guidance. The implication of such findings have been highly impactful, arguing that teachers need to implement the strategies that are strategy based when teaching the authentic content.

As a generalization, this study enhances the body of SLA literature by connecting the theoretical framework and the practice of pedagogy that the secondary education will employ as well as provides an exemplar of a model to be more effectively used in secondary schools to enhance learning and teaching of listening comprehension. This model is suggested for scaling up to other proficiency levels as well as different learning contexts in future work.

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