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# EXPLORING EFL STUDENTS' PERCEPTIONS OF SCHEMA-ACTIVATED MULTIMEDIA INSTRUCTION FOR DEVELOPING CRITICAL LISTENING SKILLS

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**Abstract:** Critical listening is an advanced listening skill that requires learners to interpret, evaluate, and synthesize spoken information in academic discourse. However, listening instruction in many EFL contexts still relies heavily on audio-only materials, which may limit learners' engagement in higher-order listening processes. This study explores EFL students' perceptions of schema-activated multimedia instruction for developing critical listening skills. The study adopted an explanatory perception-focused mixed-methods design. The participants were 30 students from the experimental group of a larger instructional study in an Indonesian university. Quantitative data were collected through a 20-item closed-ended questionnaire, while qualitative data were obtained from six open-ended questionnaire items to provide explanatory insights into students' learning experiences. Descriptive statistics were used to analyze the quantitative data, and thematic analysis was employed to interpret the qualitative responses. The results indicate that students demonstrated highly positive perceptions of schema-activated multimedia instruction across all instructional dimensions. Multimedia usage received the highest perception scores, followed by prior knowledge activation and critical listening support. Qualitative findings further revealed that schema activation enhanced cognitive readiness, multimedia support provided structural clarity and reduced cognitive load, and the instructional design encouraged metacognitive monitoring, confidence, and engagement during listening tasks. Overall, students perceived schema-activated multimedia instruction as more supportive and manageable than traditional audio-only listening activities. These findings highlight the importance of integrating schema activation and multimedia scaffolding in EFL listening instruction to facilitate learners' engagement in higher-order listening processes, particularly critical listening in academic contexts.
**Keywords:** *critical listening; schema activation; multimedia instruction; EFL listening; student perception*.

## INTRODUCTION

Listening has become a central skill in English as a Foreign Language (EFL) learning due to its fundamental role in communication and knowledge acquisition. In academic contexts, listening is not merely a receptive skill but a complex cognitive process involving perception, interpretation, and evaluation of spoken input (Worthington et al., 2024; Siegel & Wang, 2024). The growing demand for critical listening skills reflects the need for learners to analyze, interpret, and respond critically to information rather than passively receive it (Loan et al., 2024). However, many EFL learners still struggle with comprehension due to limited vocabulary, unfamiliar accents, and insufficient strategy use (Amiruddin et al., 2025). In Indonesian contexts, these challenges are further complicated by low exposure to authentic listening materials and limited classroom interaction (Siregar et al., 2026; Arbain et al., 2025). Consequently, innovative instructional approaches that integrate cognitive support and multimedia resources are increasingly required to enhance students' listening competence.

Recent developments in second language listening research emphasize the multidimensional nature of listening, integrating perception, strategy use, and technological mediation (Levis, 2025). Listening is now viewed as an active process requiring learners to construct meaning through both bottom-up and top-down processing (Fung & Lo, 2023; Hamada & Yanagawa, 2024). Studies highlight that successful listening comprehension depends on learners' ability to activate prior knowledge and apply metacognitive strategies (Bozorgian & Shamsi, 2025). Moreover, listening competence is strongly associated with learners' engagement and self-regulation (Blomstrom et al., 2025). These findings suggest that instructional approaches must address cognitive, strategic, and affective dimensions simultaneously.

Schema theory has been widely recognized as an effective framework for facilitating comprehension by activating learners' prior knowledge. Research demonstrates that schema activation supports language learning by connecting new information with existing cognitive structures (Hassan & Jawad, 2025). In writing instruction, schematic structures help learners organize ideas and construct meaning effectively (Juliana et al., 2025). Similarly, schema-based approaches in listening enable learners to anticipate content and interpret messages more efficiently (Yeh & Fu, 2025). The integration of schema theory into instructional design has therefore gained attention in EFL contexts.

In listening instruction, various techniques have been explored to enhance comprehension through schema activation. Mind mapping, for instance, has been shown to improve students' ability to organize and process auditory information (Liyan, 2025). Dictogloss and structured listening tasks also facilitate comprehension by encouraging active engagement with input (Endriati et al., 2024). Additionally, global text cohesion plays a crucial role in helping learners understand extended spoken discourse (Schmitz et al., 2024). These approaches highlight the importance of structured cognitive support in listening instruction.

The integration of multimedia technologies has further transformed listening pedagogy by providing rich and authentic input. Multimedia-based instruction, including videos, podcasts, and virtual environments, enhances learners' engagement and comprehension (Rahman et al., 2025; Tran et al., 2024). Studies show that video-based learning promotes both language proficiency and intercultural understanding (Yeh & Fu, 2025). Furthermore, virtual reality and metaverse environments create immersive listening experiences that improve learners' motivation and participation (Chan, 2024; Lee & Ko, 2025). These technological advancements offer new opportunities for integrating schema activation with multimedia input.

Audio-visual materials such as YouTube videos, podcasts, and talk shows have also been widely used to develop listening and critical thinking skills. Research indicates that such materials encourage learners to engage critically with content and develop analytical listening abilities (Harida, 2023). Podcast-based instruction has been found to improve both listening skills and learner attitudes (Sengul, 2026; Khikmatulloevna, 2025). However, challenges remain in selecting appropriate materials and ensuring effective pedagogical integration (Alamri, 2025). These findings highlight the need for structured instructional frameworks.

Critical listening, as an advanced form of listening, requires learners to evaluate arguments, detect bias, and synthesize information. Studies emphasize that critical listening is closely linked to critical thinking and higher-order cognitive skills (Song et al., 2024; Budiyanto et al., 2024). In higher education, critical listening enables students to engage more effectively in academic discourse (Gunawan et al., 2023). Metacognitive strategies have been identified as key predictors of critical listening performance (Polatcan et al., 2025). Therefore, instructional approaches must foster both cognitive and evaluative skills.

Learner-related factors also play a significant role in listening development. Self-efficacy, motivation, and emotional engagement influence learners' ability to process and comprehend spoken input (Zhang & Xu, 2025; Zeng et al., 2026). Research shows that teacher support and autonomy significantly enhance learners' engagement in listening activities (Zeng et al., 2026). Additionally, listening challenges are often associated with anxiety and lack of confidence (Giovanelli et al., 2026). These findings underscore the importance of learner-centered approaches.

Despite the growing use of multimedia, students' perceptions of such instructional approaches vary widely. Some studies report positive attitudes toward multimedia learning due to its interactive and engaging nature (Permatasari & Purwanti, 2025). Others highlight difficulties related to cognitive overload and lack of guidance

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(Daulay, 2025). Digital platforms such as Duolingo and online conferencing tools also influence learners' listening experiences (Kazu & Kuvvetli, 2025; Tran et al., 2024). Understanding students' perceptions is therefore essential for designing effective instruction.

Although previous studies have extensively examined listening strategies, multimedia learning, and schema activation, limited research has explored their integration in developing critical listening skills from students' perspectives. Existing studies tend to focus on either cognitive strategies or technological tools without examining how schema-activated multimedia instruction influences learners' perceptions and critical listening development (Dalman & Plonsky, 2025; Zhou & Thomas, 2025). Moreover, research in Indonesian EFL contexts remains scarce, particularly regarding students' subjective experiences and challenges (Siregar et al., 2026). This gap indicates the need for a more holistic investigation that combines cognitive theory, instructional design, and learner perception. Therefore, this study seeks to answer the following research question: *How do EFL students perceive schema-activated multimedia instruction in developing their critical listening skills?*

This study offers a novel contribution by integrating schema activation theory with multimedia instruction specifically for the development of critical listening skills in EFL contexts. Unlike previous studies that examine these elements separately, this research proposes a combined instructional approach that aligns cognitive activation with technological affordances (Rahman et al., 2025). Additionally, the study emphasizes students' perceptions as a central focus, providing insights into how learners experience and interpret such instructional practices. By situating the study within an Indonesian higher education context, it also contributes to underrepresented regional perspectives (Gunawan et al., 2023; Siregar et al., 2026). This integrative approach provides a more comprehensive understanding of listening instruction.

The findings of this study are expected to provide both theoretical and practical contributions to EFL pedagogy. Theoretically, it advances the understanding of how schema theory and multimedia learning can be integrated to enhance critical listening skills (Levis, 2025; Bozorgian & Shamsi, 2025). Practically, it offers insights for teachers in designing more effective and engaging listening instruction that supports learners' cognitive and affective needs (Nurhayati et al., 2024). Furthermore, the study informs curriculum developers about the importance of incorporating multimedia and schema-based approaches in listening courses. By addressing learners' perceptions, it also contributes to more learner-centered instructional practices (Blomstrom et al., 2025). Ultimately, this research aims to improve the quality of listening instruction and foster critical thinking skills in EFL education.

## METHOD

This study adopted an explanatory perception-focused mixed-methods design to investigate EFL students' perceptions of schema-activated multimedia instruction for developing critical listening skills. Quantitative data were collected through a closed-ended questionnaire to capture students' overall evaluative perceptions of the instructional approach, while qualitative data were obtained through open-ended questionnaire responses to provide explanatory insights into students' learning experiences. In line with the explanatory orientation of the study, the qualitative data functioned as supporting evidence to contextualize and enrich the quantitative findings rather than as an independent strand of inquiry.

The participants of the original study consisted of 60 students from the English Education Study Program at Universitas Muhammadiyah Palembang. However, the perception data analyzed in this article were collected only from the experimental group (n = 30), as this group was the only one exposed to the schema-activated multimedia instructional treatment.

A closed-ended questionnaire was employed to examine students' perceptions of schema-activated multimedia instruction in relation to the development of critical listening skills. The questionnaire consisted of 20 items and was administered to the experimental group after the completion of the instructional treatment. The instrument was adapted from Madden (2004) and subsequently revised to align with the present study's focus on prior knowledge activation, multimedia-supported listening, and critical listening processes in EFL contexts. Each item was measured using a four-point Likert scale, ranging from 1 (strongly disagree) to 4 (strongly agree). A neutral response option was intentionally excluded in order to encourage students to express clear evaluative judgments regarding the instructional approach.

The questionnaire items were organized into three dimensions: (1) Prior Knowledge Activation

(Items 1–7). This dimension examined students' perceptions of schema activation before listening, including background knowledge recall, topic familiarity, and prediction of content. (2) Multimedia Usage (Items 8–14). This dimension assessed students' perceptions of multimedia support, such as audio clarity, visual cues, multimodal input, and the role of multimedia in reducing cognitive load during listening tasks. (3) Critical Listening Process (Items 15–20). This dimension focused on perceived support for higher-order listening processes, including inference making, evaluation of arguments, interpretation of speaker intention, and integration of ideas across speakers.

To ensure content validity, the questionnaire items were developed based on established theoretical frameworks in schema theory, multimedia learning theory, and critical listening research, and were reviewed for relevance and clarity prior to administration. Before the main data collection, the instrument underwent a try-out to examine its psychometric properties. Item validity was tested using Pearson Product Moment correlation, and all 20 items were retained as valid, with r-obtained values exceeding the critical r-table value (0.361). The internal consistency reliability of the questionnaire was examined using Cronbach's Alpha, yielding a coefficient of 0.919, which indicates high reliability and exceeds the commonly accepted threshold of 0.70 for educational research. For interpretive purposes, students' total perception scores were classified into high and low perception categories using the empirical mean as the cut-off point, following the category norm procedure proposed by Azwar (2012). Students whose total scores were equal to or above the mean were categorized as having high perception, while those whose scores fell below the mean were categorized as having low perception.

To gain deeper insight into students' learning experiences with schema-activated multimedia instruction, qualitative data were collected through a structured open-ended questionnaire consisting of six questions, administered to the same participants after the instructional treatment. This qualitative instrument was designed to capture students' reflective accounts of the perceived benefits, challenges, and overall impressions of the instructional approach, allowing participants to express their perspectives in their own words.

The six open-ended questions were organized into two main sections corresponding to the core components of the instructional design: Part 1: Prior Knowledge Activation (Questions 1–3). (1) Students' familiarity with the listening topic before engaging in the task. (2) The role of prior knowledge in supporting understanding of the discussion. (3) Students' perceived preparedness to engage in critical listening. Part 2: Multimedia Usage (Questions 4–6) (4) How multimedia features (e.g., video, audio, visual cues) helped or hindered understanding, (5) Specific visual or audio features that encouraged deeper thinking or critical reflection. (6) Students' perceived differences in learning experience if the task were delivered in an audio-only format.

These open-ended items prompted students to reflect on their cognitive**,** strategic, and affective experiences during multimedia-supported critical listening tasks. The qualitative data were explicitly positioned as explanatory and supportive, serving to clarify *how* and *why* prior knowledge activation and multimedia support influenced students' engagement, comprehension processes, and critical listening development. Rather than functioning as an independent strand of inquiry, the qualitative findings were used to complement and enrich the interpretation of the quantitative questionnaire results.

Data were collected at the final stage of the instructional intervention. Students first completed the closed-ended questionnaire to provide an overall evaluative judgment of the instructional approach. Subsequently, they responded to the open-ended questions to elaborate on their experiences in their own words. This sequential administration ensured consistency between quantitative ratings and qualitative reflections.

Quantitative data from the closed-ended questionnaire were analyzed using descriptive statistics. Mean scores were calculated for each questionnaire dimension and for the overall perception scale. Students' perception levels were then categorized into high and low perception groups based on the empirical mean. The analysis aimed to describe general trends in students' evaluations of prior knowledge activation, multimedia usage, and critical listening support.

The qualitative data obtained from the open-ended questionnaire were analyzed using thematic analysis following the procedures proposed by Braun and Clarke (2006). The analysis involved several stages, including data familiarization, initial coding, theme identification, theme review, and theme refinement. During the first stage, all responses were carefully read multiple times to gain a comprehensive understanding of the participants' perspectives. Meaningful segments of text were then coded to identify recurring patterns

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related to students' perceptions of schema-activated multimedia instruction.

To enhance analytical rigor, two researchers independently conducted the coding process. After the initial coding stage, the researchers compared their coding results and discussed any discrepancies until agreement was reached. Through iterative comparison and discussion, the initial codes were grouped into broader categories and subsequently organized into thematic patterns that reflected students' shared experiences.

The final themes were developed through an inductive process that involved reviewing coded data extracts and examining their relationships with the overall dataset. Representative excerpts from participants' responses were then selected to illustrate each theme and provide supporting evidence for the interpretation of the findings.

To ensure the trustworthiness of the qualitative analysis, this study adopted the criteria proposed by Lincoln and Guba (1985), including credibility, transferability, dependability, and confirmability. Credibility was enhanced through repeated reading of the data and collaborative coding conducted by two researchers to minimize subjective interpretation. Transferability was addressed by providing detailed descriptions of the instructional context and participants' responses, allowing readers to evaluate the applicability of the findings to similar educational settings. Dependability was ensured through systematic documentation of the analytical procedures, including coding development and theme refinement. Finally, confirmability was maintained by grounding the interpretations in participants' responses and presenting illustrative excerpts that demonstrate how the themes emerged from the data.

To enhance credibility, the qualitative analysis was conducted systematically and integrated with the quantitative results. Convergence between numerical trends and thematic patterns was used as a form of methodological triangulation. In line with the explanatory purpose of the study, qualitative findings were interpreted as supporting evidence that enriched the understanding of students' perceptions rather than as standalone evaluative data.

## RESULTS AND DISCUSSION

*Students' perceptions based on the closed-ended questionnaire (quantitative results)*

Students' perceptions of schema-activated multimedia instruction were analyzed using descriptive statistics based on responses to the 20-item closed-ended questionnaire. The questionnaire examined three dimensions: prior knowledge activation, multimedia usage, and critical listening process. Mean scores were calculated for each dimension as well as for the overall perception scale.

Table 1. *Descriptive statistics of students' perceptions of schema-activated multimedia instruction*

| Dimension | Number of Items | Mean (M) | Standard Deviation (SD) | Perception Level |
|---|---|---|---|---|
| Prior Knowledge Activation | 7 | 3.42 | 0.41 | High |
| Multimedia Usage | 7 | 3.55 | 0.38 | High |
| Critical Listening Process | 6 | 3.31 | 0.44 | High |
| Overall Perception | 20 | 3.43 | 0.39 | High |

Note. The perception levels were determined using the empirical mean as the cut-off point (Azwar, 2012). Scores ranged from 1 (strongly disagree) to 4 (strongly agree).

*Overall students' perceptions*

The descriptive results indicate that students demonstrated a high overall perception of schema-activated multimedia instruction for developing critical listening skills (M = 3.43, SD = 0.39). This finding suggests that students generally viewed the instructional approach as beneficial and more supportive compared to conventional listening instruction, which typically relies on audio-only materials. Such positive perceptions are in line with previous research indicating that multimedia-supported listening environments enhance learners' engagement and comprehension more effectively than traditional approaches (Rahman et al., 2025; Tran et al., 2024). Additionally, technology-enhanced learning environments have been shown to create more interactive and meaningful listening experiences for EFL learners (Chan, 2024; Kazu & Kuvvetli, 2025)

*Perceptions of prior knowledge activation*

The prior knowledge activation dimension obtained a high mean score (M = 3.42, SD = 0.41), indicating that students perceived pre-listening activities, such as topic introduction, background knowledge activation, and prediction, as effective in preparing them for listening tasks. Students reported that having initial familiarity with the topic reduced confusion and enabled them to follow the listening content more efficiently. This

finding suggests that schema activation functioned as a crucial preparatory mechanism, allowing learners to approach listening tasks with greater cognitive readiness rather than limited contextual understanding.

This result is consistent with schema-based approaches in EFL learning, which emphasize the importance of activating prior knowledge to facilitate comprehension and meaning construction (Hassan & Jawad, 2025; Yeh & Fu, 2025). Empirical studies further confirm that schema activation supports learners in anticipating discourse and interpreting spoken input more effectively (Juliana et al., 2025; Liyan, 2025).

*Perceptions of multimedia usage*

Among the three dimensions, multimedia usage received the highest mean score (M = 3.55, SD = 0.38), reflecting students' strong positive perceptions of the use of video, visual cues, and multimodal input during listening instruction. Students indicated that multimedia support made listening activities more engaging and easier to follow compared to traditional audio-only approaches. The relatively high mean score in this dimension suggests that multimedia elements, such as visual keywords, topic previews, and integrated audio-visual input, helped students maintain attention, follow the progression of ideas, and manage the cognitive demands of processing spoken discourse.

These findings are consistent with studies demonstrating that multimedia-based instruction enhances listening comprehension and reduces cognitive burden in language learning (Rahman et al., 2025; Miholjančan et al., 2024). Similarly, the integration of multimodal input has been shown to improve learners' attention and overall understanding in EFL listening contexts (Lee & Ko, 2025; Daulay, 2025).

*Perceptions of the critical listening process*

Students' perceptions of the critical listening process dimension also reached a high level (M = 3.31, SD = 0.44), indicating that the instructional approach effectively supported higher-order listening skills, including making inferences, evaluating arguments, interpreting speaker intentions, and integrating ideas across speakers.

Although critical listening involves cognitively demanding processes, the positive perception scores suggest that the combination of prior knowledge activation and multimedia support enabled students to engage with these processes more confidently and effectively than in conventional listening instruction. This finding aligns with research highlighting that critical listening is closely associated with higher-order thinking and requires structured instructional support (Song et al., 2024; Budiyanto et al., 2024). Moreover, metacognitive strategies and guided instruction play a crucial role in enabling learners to perform evaluative and interpretive listening tasks (Polatcan et al., 2025; Bozorgian & Shamsi, 2025).

*Summary of questionnaire findings*

Overall, the closed-ended questionnaire results demonstrate that students perceived schema-activated multimedia instruction as highly supportive across all instructional dimensions. The highest perception was observed in multimedia usage, followed by prior knowledge activation and critical listening processes. These findings indicate that integrating pre-listening schema activation with multimedia-supported listening activities was perceived as more effective and engaging than audio-only listening instruction. The quantitative perception results provide empirical support for the instructional approach and serve as a foundation for the qualitative findings presented in the following section, which further explain how and why students experienced the instructional design as beneficial.

*Students' perceptions based on the open-ended questionnaire (qualitative results)*

This section presents the qualitative findings derived from students' responses to the six open-ended questionnaire items administered after the instructional treatment. In line with the explanatory orientation of this study, the qualitative data do not function as an independent strand of analysis but serve to explain and contextualize the quantitative perception results obtained from the closed-ended questionnaire.

The analysis followed an inductive thematic approach, through which recurring patterns in students' responses were identified and organized into five major themes. These themes illustrate how students experienced schema-activated multimedia instruction and explain why the instructional approach was perceived as supportive for critical listening development.

*Theme 1: Prior Knowledge Activation Enhances Cognitive Readiness*

Students consistently reported that activating prior knowledge before listening helped them begin the task with greater readiness and reduced initial

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confusion. Familiarity with the topic enabled students to anticipate content and orient themselves to the discussion more quickly.
One student noted:

> "I had seen this topic before in other classes and online articles, so I already had an idea of what the discussion might include."

Another student stated:

> "I knew a bit about the topic from videos I watched before, so it helped me follow the discussion more easily."

These responses indicate that schema activation functioned as a preparatory mechanism, allowing students to approach the listening task with confidence rather than uncertainty.

*Theme 2: Multimedia Provides Structural Clarity and Supports Meaning Making*
Students emphasized that multimedia elements, such as visual keywords, topic previews, and clear audio, helped them understand the structure of the discussion and follow the flow of ideas more effectively. The combination of audio and visual input made complex discussions easier to process.
A representative response stated:

> "The multimedia helped me follow the discussion better because the visuals showed the main points and the audio was clear."

Another student commented:

> "The visuals supported me when the speakers talked too fast. They helped me stay on track."

These reflections suggest that multimedia support played a key role in organizing information and guiding students' attention to essential content.

*Theme 3: Multimedia Reduces Cognitive Load During Complex Listening Tasks*
Several students explicitly mentioned that multimedia support made the listening tasks feel less overwhelming. Visual cues helped them manage information more efficiently compared to audio-only listening.

One student explained:

> "Listening with visuals felt lighter. If it was audio only, it would be harder to remember all the ideas."

Another student wrote:

> "The visuals helped me match what I heard with what I saw, so it was easier to understand."

This theme highlights the role of multimedia in reducing cognitive load, enabling students to allocate more mental resources to higher-order listening processes.

*Theme 4: Instructional Design Encourages Metacognitive Monitoring and Evaluation*
Students' responses revealed evidence of metacognitive engagement, particularly monitoring and evaluating understanding during listening. Many students described checking their comprehension, confirming predictions, and evaluating speakers' viewpoints with the help of visual support.
One student stated:

> "The visuals helped me check if my understanding was correct and see the arguments more clearly."

Another student explained:

> "I could evaluate the speakers' ideas better because I knew what I should focus on."

These responses indicate that the integration of schema activation and multimedia support fostered reflective listening behaviors essential to critical listening.

*Theme 5: Increased Confidence, Engagement, and Motivation*
In addition to cognitive benefits, students frequently expressed positive affective responses toward the instructional approach. They reported feeling more confident, focused, and motivated during listening activities.

One student remarked:

> "I felt more confident because I did not start the task from zero."

Another student added:

> "The multimedia made the lesson more interesting, so I stayed focused longer."

This theme underscores the affective value of schema-activated multimedia instruction in creating a supportive learning environment conducive to sustained engagement.

*Summary of qualitative findings*

Across the six open-ended questions, students consistently described schema-activated multimedia instruction as supportive and effective. Prior knowledge activation enhanced readiness and reduced confusion, while multimedia support provided structure, reduced cognitive load, and encouraged metacognitive monitoring. Together, these factors contributed to increased confidence and engagement during critical listening tasks. Overall, the qualitative findings explain why students perceived the instructional approach positively in the closed-ended questionnaire and clarify how the combination of schema activation and multimedia support addressed limitations of traditional audio-only listening instruction.

Table 2. *Thematic summary table*

| Initial Codes | Sub Themes | Main Themes |
|---|---|---|
| familiarity, prediction, reduced confusion | cognitive readiness | Prior knowledge activation helps students begin with greater readiness |
| visual cues, keyword previews, clarity | structural clarity | Multimedia gives students a clearer structure to follow |
| reduced difficulty, easier processing | lighter cognitive load | Multimedia helps reduce cognitive load |
| checking understanding, evaluating | reflective monitoring | Instruction supports metacognitive monitoring |
| confidence, focus, motivation | emotional engagement | Students feel more confident and engaged |

*Additional qualitative insights from open-ended responses*

Further analysis of students' responses to the six open-ended questionnaire items provides more detailed insight into how schema activation and multimedia support shaped learners' critical listening experiences. These findings elaborate the five major themes identified earlier and strengthen the explanatory link between students' perceptions and the quantitative results.

First, students' responses to Question 1 indicate that prior familiarity with the listening topic played an important role in reducing initial uncertainty. Most students reported having some background knowledge gained from previous classroom discussions, readings, or online media exposure. This familiarity enabled them to approach the listening task with greater comfort and readiness, rather than confusion. As one student noted, "I had seen this topic before in other classes and online articles, so I already had an idea of what the discussion might include." Such responses suggest that prior knowledge provided an initial mental framework that facilitated entry into the listening task.

Responses to Question 2 further revealed that prior knowledge supported comprehension by helping students connect new information with existing knowledge structures. Students explained that background knowledge allowed them to anticipate content, recognize the logical development of ideas, and follow the discussion more easily. One student stated, "My background knowledge helped me connect the ideas faster and made it easier to understand the speakers." These reflections illustrate the role of schema activation in meaning making, consistent with schema theory, where comprehension is supported through the integration of familiar and new information.

In Question 3, students emphasized that prior knowledge not only facilitated comprehension but also enhanced their preparedness for critical listening. Many reported that understanding the topic in advance allowed them to focus more on evaluating arguments rather than struggling with basic meaning. As one student explained, "I already had a basic picture of the topic, so I could focus more on the arguments." This finding indicates that schema activation reduced the cognitive effort required for surface-level comprehension and enabled learners to engage in higher-order listening behaviors such as evaluation and comparison of viewpoints.

Students' responses to Question 4 highlight the perceived value of multimedia support during listening. Almost all participants described multimedia elements, such as clear audio, visual keywords, and topic previews, as helpful in making the listening task more manageable. Students reported that visual support helped them stay focused, particularly when the speakers talked quickly. Importantly, no student indicated that multimedia hindered comprehension, suggesting

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that multimedia functioned as a meaningful scaffold rather than a distraction.

In Question 5, students identified specific multimedia features that supported critical thinking. Visual keywords and structured previews were most frequently mentioned as helpful for guiding attention and highlighting key ideas. Students explained that these features helped them analyze arguments more effectively, indicating that multimedia support facilitated deeper processing beyond surface comprehension.

Finally, responses to Question 6 reveal a clear contrast between schema-activated multimedia instruction and traditional audio-only listening. Students overwhelmingly stated that an audio-only format would be more difficult, less structured, and more cognitively demanding. Visual cues were perceived as essential for maintaining focus and understanding the flow of discussion. One student commented, "Without visuals, I would probably misunderstand the flow of the discussion." These reflections underscore the role of multimedia in reducing cognitive load and supporting sustained critical engagement.

Taken together, the responses across all six open-ended questions consistently portray the instructional approach as supportive and effective. Prior knowledge activation enhanced readiness and confidence, while multimedia support provided clarity, reduced cognitive load, and encouraged deeper evaluation of spoken content. These qualitative insights help explain why the experimental group demonstrated stronger outcomes in the quantitative analysis, as the instructional design provided learners with the preparation, structure, and cognitive support necessary for successful critical listening.

Table 3. *Summary of qualitative findings from open-ended questionnaire*

| Open-Ended Question | Focus of the Question | Summary of Student Responses | Illustrative Student Quotes | Resulting Theme |
|---|---|---|---|---|
| 1. Were you familiar with the topic before the listening task | Prior familiarity and schema activation | Most students reported having some level of familiarity through previous lessons, readings, or online content. Familiarity reduced confusion at the beginning and helped them enter the task with more readiness. | "I had seen this topic before in other classes, so it was easier to start listening." | |
| "I already knew a bit from online videos, so I understood faster." | Prior knowledge activation enhances readiness | | | |
| 2. How did your prior knowledge help you understand the discussion | The role of schema in meaning-making | Students said prior knowledge helped them predict content, connect ideas, and recognize the structure of the discussion. It made the listening process more manageable. | "My background knowledge helped me connect the ideas faster." | |
| "It allowed me to predict the speakers points." | Prior knowledge supports comprehension and prediction | | | |
| 3. Did you feel more prepared to listen critically because of your prior understanding | Preparedness for critical listening | Students felt more confident and able to focus on evaluating arguments because they did not struggle with basic comprehension. | "I felt more prepared because I already had a general picture of the topic." | |
| "I could focus on the arguments, not just understanding the words." | Preparedness for critical listening | | | |
| 4. How did the use of multimedia help or hinder your understanding | Multimedia facilitation | All students viewed multimedia as helpful. Visual keywords, topic previews, and clear audio made the content clearer and easier to follow. | "The multimedia helped me follow the discussion better because the visuals showed the main points." | |
| "The visuals supported me when the speakers talked too fast." | Multimedia improves clarity and structure | | | |

| | | | |
|---|---|---|---|
| 5. Which multimedia features helped you think more critically | Role of visual/audio cues in deeper processing | Students highlighted keyword previews and simple visuals as the most helpful. These elements guided attention and supported evaluation of arguments. | "The keyword visuals helped me focus and think more critically." |
| "The visuals made it easier to analyze the arguments." | Multimedia promotes deeper reflection | | |
| 6. How different would your experience be if the task was audio-only | Perceived dependence on multimedia | Students stated that audio-only tasks would be more difficult, less structured, and more overwhelming. Visual cues reduced cognitive load. | "If it was audio only, I think I would miss some important ideas." |
| "Without visuals, I would struggle with the flow of the discussion." | Multimedia reduces cognitive load and supports comprehension | | |

This study investigated EFL students' perceptions of schema-activated multimedia instruction for developing critical listening skills by integrating quantitative questionnaire data with supporting qualitative findings. Overall, the results indicate that students perceived the instructional approach as highly supportive across all dimensions, particularly when compared to conventional audio-only listening instruction. These findings extend previous listening research by demonstrating that learners' positive perceptions are closely linked to how instructional design reduces cognitive demands and scaffolds higher-order listening processes (González & Barreiro, 2025; Miholjančan et al., 2024).

The high overall perception scores obtained from the closed-ended questionnaire suggest that students viewed schema-activated multimedia instruction as beneficial for their listening experience. This finding aligns with prior studies reporting that learners respond more positively to listening instruction that provides contextual and visual support rather than relying solely on auditory input (Coleman et al., 2025; Hui & Godfroid, 2026). Importantly, the present findings go beyond general listening comprehension by focusing on critical listening, a higher-order skill involving inference, evaluation, and interpretation of spoken discourse (Petkou et al., 2025; Stanley & Gilzene, 2023).

One key explanatory insight emerging from the qualitative data is the role of prior knowledge activation in enhancing cognitive readiness. Students consistently reported that pre-listening activities, such as topic explanation and background knowledge activation, helped them reduce confusion and enter the listening task with clearer expectations. This finding is consistent with schema-based approaches in EFL learning, which emphasize the role of prior knowledge in facilitating comprehension and prediction (González & Barreiro, 2025). Additional studies confirm that activating schematic knowledge enhances inferential processing and global understanding in language learning contexts (Hui & Godfroid, 2026). In the context of critical listening, schema activation appears to enable learners to allocate cognitive resources to evaluative and interpretive processes rather than basic decoding.

The findings also highlight the central role of multimedia support in shaping students' perceptions. Multimedia usage received the highest mean score, indicating strong agreement that video, visual cues, and multimodal input facilitated understanding. Qualitative responses revealed that multimedia elements provided structural clarity, guided attention, and reduced cognitive load. These results align with research demonstrating the cognitive benefits of multimedia-based instruction in enhancing listening comprehension and engagement (Coleman et al., 2025; Miholjančan et al., 2024). Furthermore, digital technologies have been shown to support comprehension by integrating multiple modes of input (Beuscart et al., 2023; Vitis & Ryan, 2023).

Crucially, students' reflections suggest that multimedia support enabled more effective engagement in critical listening processes. Learners described confirming predictions, monitoring comprehension, and evaluating arguments using visual cues. These behaviors correspond with listening strategies involving planning, monitoring, and evaluation (González & Barreiro, 2025). Recent empirical studies emphasize that strategic awareness significantly contributes to listening comprehension and higher-order processing (Hui & Godfroid, 2026; Zhou & Thompson, 2023). The present findings reinforce

this perspective by illustrating how schema activation and multimedia scaffolding jointly supported cognitive regulation.

Students' comparison between schema-activated multimedia instruction and audio-only listening further strengthens the pedagogical implications. Participants reported that audio-only listening felt more overwhelming and cognitively demanding. This perception resonates with studies highlighting the challenges learners face when processing spoken input without sufficient contextual or visual support (Gerald & Joseph, 2024). Multimedia support appears to function not merely as an enhancement but as a cognitive scaffold that makes higher-order listening more accessible and manageable.

In addition to cognitive benefits, qualitative findings revealed affective advantages, including increased confidence, engagement, and motivation. Students reported feeling better prepared and less anxious when prior knowledge activation and multimedia support were provided. These findings align with research indicating that learner engagement and emotional factors significantly influence listening performance and participation (Harris, 2025; Zhou & Thompson, 2023). Moreover, technology-enhanced listening environments have been shown to increase learner motivation and positive attitudes toward language learning (Vitis & Ryan, 2023).

Taken together, the results suggest that schema-activated multimedia instruction supports critical listening development through three interrelated mechanisms: (1) cognitive readiness fostered by prior knowledge activation, (2) cognitive load reduction and structural clarity provided by multimedia support, and (3) systematic regulation encouraged through guided listening processes. These mechanisms align with contemporary views of listening as an interactive, strategic, and cognitively demanding process (Kluger et al., 2024; Petkou et al., 2025). The convergence of quantitative and qualitative findings strengthens the explanatory coherence of the study and supports the pedagogical value of integrating schema activation and multimedia scaffolding in EFL listening instruction.

## CONCLUSION

This study investigated EFL students' perceptions of schema-activated multimedia instruction in developing critical listening skills by integrating quantitative and qualitative findings. The results indicate that students perceived the approach as more effective than conventional audio-only instruction, particularly in enhancing comprehension, reducing cognitive load, and supporting higher-order listening processes such as inference, evaluation, and interpretation. The findings further reveal that schema activation, multimedia support, and metacognitive guidance functioned as complementary mechanisms that facilitated both cognitive processing and learner engagement. In addition, positive affective responses, including increased confidence and motivation, suggest that the approach contributes to a more supportive learning environment.

Pedagogically, the study highlights the importance of moving beyond audio-only listening practices by incorporating prior knowledge activation, structured multimedia scaffolding, and metacognitive strategy instruction. These elements can help learners engage more effectively with complex academic discourse and develop critical listening abilities.

However, the study is limited by its single-context design and reliance on self-reported data. Future research is recommended to examine the long-term impact of this instructional approach across diverse contexts and to employ more in-depth qualitative methods. Overall, this study underscores the role of intentional instructional design in fostering critical listening and supports the integration of schema-activated multimedia approaches in EFL listening pedagogy.

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