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The Impact of Multimedia Learning Models on Listening Comprehension: A Systematic Review of Self-Efficacy and Technology Integration

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Abstract: The purpose of this systematic review is to examine the impact of multimedia learning models on listening comprehension, with a particular focus on the roles of self-efficacy and technology integration. The study utilizes the PRISMA methodology to ensure rigor in the systematic review process, synthesizing research findings from 2019 to 2024. Results show that multimedia learning models significantly improve listening comprehension by providing diverse and engaging methods, aligning with Mayer's cognitive theory of multimedia learning. Additionally, self-efficacy and technology integration were identified as critical moderating factors, enhancing both learning outcomes and learner confidence. This review contributes to the development of effective multimedia learning environments, offering valuable insights for educators, instructional designers, and policymakers.

Keywords: Listening Comprehension, Multimedia Learning, Self-Efficacy, Systematic Review, Technology Integration

A. Introduction

Multimedia learning has gained significant attention in the field of education, especially in enhancing students' listening comprehension skills. The integration of various media forms text, audio, video, and graphics has been shown to support cognitive processes and promote deeper understanding (Mayer, 2014). Multimedia learning models, which integrate visual, auditory, and textual elements, have emerged as powerful tools to enhance students' listening comprehension. Rooted in Mayer's (2020) cognitive theory of multimedia learning, these models leverage both visual and auditory channels to foster deeper cognitive engagement, leading to improved retention and understanding. Listening comprehension, particularly in language learning, is one of the skills that benefit greatly from multimedia learning, as students can interact with a variety of formats such as audio recordings, videos,

and animations (Mayer, 2020). Studies demonstrate that using diverse content formats such as video lectures, animations, and audio recordings enables learners to grasp material more effectively by providing richer contextual input (Clark & Mayer, 2016; Namaziandost & Nasri, 2019). This approach aligns with the demands of modern education, evident in assessments like TOEFL and CET, where audio-visual content promotes realistic, immersive experiences that enhance comprehension (Zhyrun, 2020). Research consistently shows that integrating multimedia can improve listening comprehension outcomes due to the multimodal nature of the content, which engages multiple cognitive processes (Clark & Mayer, 2016).

Additionally, self-efficacy learners' belief in their capability to accomplish tasks has been proven to be a key factor in academic performance (Bandura, 1997). Students with high self-efficacy are more likely to engage with challenging content, persist longer, and perform better (Zhou et al., 2021). Furthermore, technology integration has brought new tools into the educational landscape, providing opportunities for interactive and personalized learning, which can foster both comprehension and self-efficacy (Hattie, 2020).

Currently, several studies have investigated multimedia learning models and their effects on listening comprehension. However, most research focuses on individual components, such as the effectiveness of specific multimedia tools or the role of self-efficacy in general academic performance. Furthermore, recent advances in educational technology, such as adaptive learning systems and AI-powered tools, have begun to shape a new frontier in how we approach multimedia learning, particularly in developing listening skills (Goh et al., 2022). However, no substantial reviews have synthesized findings from recent research on how these technological innovations interact with self-efficacy and influence listening comprehension.

Despite the acknowledged benefits of multimedia learning and self-efficacy, there remains a gap in understanding how these elements interact to influence listening comprehension. Furthermore, further research is needed to understand the interaction between these models and other key factors such as self-efficacy and technology integration. Although prior studies have individually examined the impact of multimedia elements and self-efficacy on student performance, the nuanced relationship between these components within diverse educational contexts remains unclear. Moreover, the scalability of multimedia models across various learning environments such as online, blended, or traditional classrooms has not been fully explored, particularly when access to digital resources varies among students (Tan et al., 2022).

To address these gaps, this systematic review examines the impact of multimedia learning models on listening comprehension while exploring the roles of self-efficacy and technology integration as moderating factors. Using the PRISMA (Preferred

Reporting Items for Systematic Reviews and Meta-Analyses) methodology, this review synthesizes recent research findings and identifies areas for future investigation. Specifically, it aims to answer two key research questions: (1) *How do multimedia learning models impact listening comprehension? (2) What role do self-efficacy and technology integration play in this relationship?*

The insights from this review will be valuable for educators, instructional designers, and policymakers, offering practical recommendations for developing more effective multimedia learning environments. By synthesizing the latest findings, this study not only highlights the benefits of multimedia models but also addresses the challenges and complexities involved in their implementation. Ultimately, this research aims to empower educational stakeholders to leverage multimedia tools in ways that enhance both listening comprehension and learner confidence.

B. Methods

This study follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework to ensure rigor, transparency, and replicability in the systematic review process (Page et al., 2021). Adhering to PRISMA guidelines is essential for clearly documenting the methods used in study identification, selection, and data extraction, as well as ensuring consistency and thoroughness in the analysis (Page & Moher, 2019). The methodology consists of the following steps: literature search strategy, inclusion and exclusion criteria, data extraction, and data analysis. The comprehensive searches were performed across multiple databases, including Google Scholar, and Scopus, using specific keywords such as "*multimedia learning*," "*listening comprehension*," "*self-efficacy*," and "*technology integration*." Only peer-reviewed studies published between 2019 and 2024 were considered to maintain the currency and relevance of the findings. This search strategy ensured that the most recent advancements in multimedia learning models were captured, particularly those addressing self-efficacy and technology integration in various educational settings (Tan et al., 2022; Goh et al., 2022).

Data collection involved extracting key information from each selected study, including the research design, sample size, multimedia learning model identified, and the impact on listening skills. The data analysis process involved thematic synthesis to identify recurring patterns and key themes across the selected studies. Some studies applied meta-analysis techniques to quantify the impact of multimedia learning models on listening comprehension, providing a more nuanced understanding of effect sizes and trends. This combination of thematic and statistical analysis offers a robust framework for interpreting the interplay between multimedia models, self-efficacy, and technology integration (Cambridge Core, 2022). The findings were synthesized to highlight common themes and discrepancies across studies, providing a comprehensive overview of the multimedia learning models while exploring the

roles of self-efficacy and technology integration as moderating factors for Indonesian EFL learners. The preferred reporting items for PRISMA is explained in detail in Figure 1.

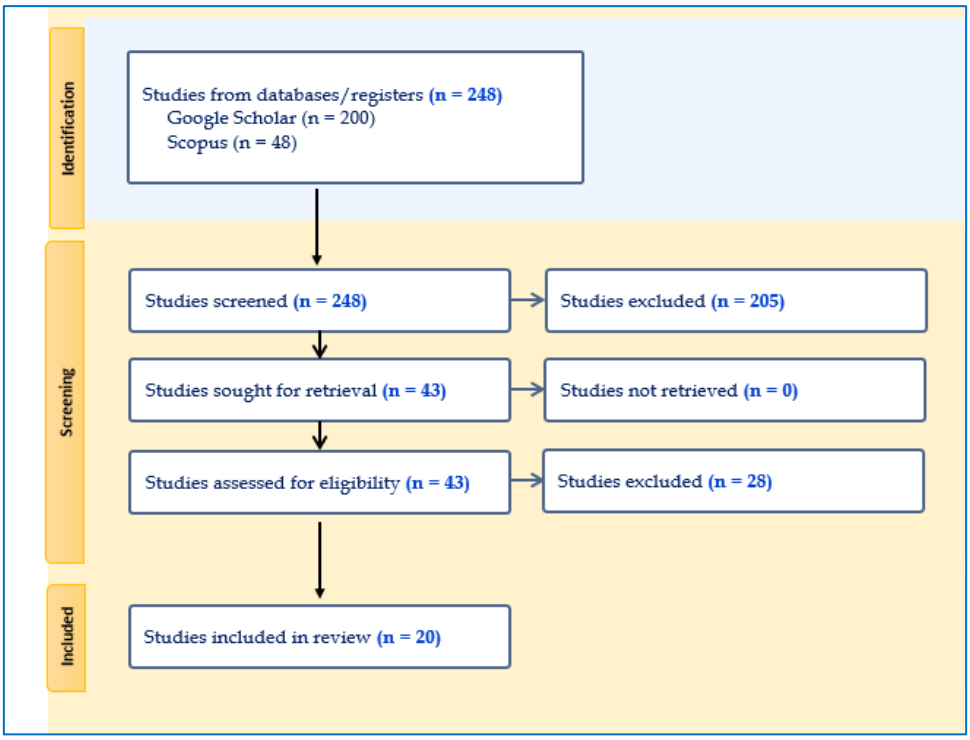

Figure 1. PRISMA flow diagram for screening articles in journal

The inclusion and exclusion criteria ensured that only high-quality and relevant studies were considered for the review. Simpson and Matsuda (2020) argue that "Clear inclusion and exclusion criteria are critical for refining the scope of systematic reviews, particularly when examining educational interventions like Photovoice." Table 1 details the inclusion and exclusion criteria used in this study.

Table 1. Inclusion and Exclusion criteria

Inclusion Criteria
Studies published between 2019 and 2024
Journal articles
Developmental research articles
Focus of the study is Multimedia learning model in listening comprehension, while self-efficacy and technology integration as moderating factors
Exclusion Criteria
Articles published before 2019
Articles irrelevant to the scope of the review
Healthcare
Book Chapters
Conference Proceedings

Based on the findings from the database search as shown in the uploaded document, the researcher identified 200 articles from Google Scholar, 48 articles from Scopus, totaling 248 articles that discussed relevant studies. After screening, 205 articles were excluded for various reasons, including incorrect study design. In total, 43 studies were sought for further evaluation, out of which 28 were excluded based on design, leaving 20 articles that met the inclusion criteria and were included in the final review.

C. Results and Discussion

The PRISMA method helps organize and categorize articles into broader themes. The diagram clearly shows the steps for identifying and screening literature using specific criteria, such as eligibility, inclusion, and exclusion, that are relevant to the review's focus. A systematic review uses a structured approach to assess existing research, aiming to reduce biases that can occur in purely narrative analysis.

The systematic review of the twenty selected studies showed important findings about the multimedia learning models that help Indonesian EFL learners improve their listening skills. These findings highlight the key motivational factors involved in developing speaking skills.

The selected articles were thoroughly analyzed, and key information was extracted, including: (1) author(s) and year of publication, (2) title, (3) sample country, (4) methodology, and (5) main findings reported. The literature was then coded and categorized into two research clusters for an in-depth analysis. The identified research clusters are: (1) The impact of multimedia learning models in listening comprehension, and (2) the role of self-efficacy and technology integration play in this relationship. This section will go into detail about these main findings, creating a clear story that links the different aspects together. The results are summarized in the table below:

Table 3. Reviewed Article

Author(s) (Year)	Title	Sample	Methodology	Findings
RQ.1 *How do multimedia learning models impact listening comprehension?*				
Shaojie, T., Samad, A. A., Ismail, L. (2022)	**Systematic literature review on audio-visual multimodal input in listening comprehension.**	The article itself does not involve direct samples or participants but rather analyzes existing literature on the topic.	The study employed a systematic literature review methodology, which involved a three-stage screening process to filter relevant literature. This included an initial filter based on title and abstract keywords, followed by a second filter to exclude irrelevant studies, and a final filter to assess the overall quality of the remaining studies.	The systematic literature review found that audio visual input significantly enhances second language learners' comprehension by providing more authentic language input and richer multimodal cultural and situational contexts, which in turn promotes understanding and stimulates interest in listening comprehension tasks. Key factors influencing the difficulty of audiovisual multimodal input include the presence of subtitles, the type of video used, and the relationship between audio and visual components, with empirical research indicating that the combination of audio and video with English subtitles is the most effective for promoting listening comprehension.
Zarei, A. A., Oruji, M. (2019)	**The Effect of Multimedia Gosses on L2 Listening Comprehension**	The population sample size consisted of 94 male students studying at Rasa English Institute in Tehran by using randomly assigning the participants into three group.	**Experimental Design**: The research employed a quasi-experimental design.	The study found that textual-pictorial glosses had a significant effect on foreign language listening comprehension among the participants, indicating that this type of multimedia glossing enhances understanding of the material being listened to. The analysis of the data obtained from the listening comprehension post-test was conducted using one-way ANOVA, which confirmed the effectiveness of the different glossing methods on improving listening comprehension skills.

Author(s) (Year)	Title	Sample	Methodology	Findings
Chia-chi Chien, Yenling Huang, Peiwen Huang (2020)	**YouTube Videos on EFL College Students' Listening Comprehension**	• The population sample size consisted of 38 Taiwanese college students aged 18-20, all of whom had a high intermediate level of proficiency in English and were preparing to take The General English Proficiency Test (GEPT). • The sampling method involved selecting students from the same class, ensuring that they were all exposed to the multimedia learning environment using YouTube as a supplementary material for their listening comprehension training.	• The study employed a paired T-Test to analyze the data and determine if there was a significant difference in students' listening comprehension before and after the 5-week treatment involving YouTube as a supplementary material. This statistical method helped validate the pre-specified results of the research. • A questionnaire was administered to the students after the post-test to assess their perceptions and reflections on integrating YouTube into their courses. This included a scoring rubric to evaluate their feedback on the effectiveness of using YouTube as a learning tool in conjunction with traditional teaching methods.	• The research found that after a 5-week treatment combining YouTube with traditional teaching methods, students demonstrated a significant improvement in their listening comprehension scores compared to their performance before the treatment. This was validated through paired T-Test analysis, indicating that the integration of multimedia resources like YouTube can enhance learning outcomes. • The majority of students expressed positive perceptions regarding the use of YouTube as a learning tool, indicating a willingness to engage with English language learning through this medium. The feedback suggested that students found YouTube to be an effective and convenient resource for improving their English listening skills.

Author(s) (Year)	Title	Sample	Methodology	Findings
Nur Oktaviani, fenny Thresia (2021)	**The influence of using podcast toward listening comprehension**	• The population sample consists of students majoring in Multimedia at the first grade of SMK 4 Metro. • The research design employed a quasi-experimental method to assess the impact of using podcasts on listening comprehension among the students	A quasi-experimental method to assess the impact of using podcasts on students' listening comprehension. This approach allowed for comparison between groups of students who were taught using podcasts and those who were not. To evaluate the students' listening comprehension, the researcher utilized a written test, which provided measurable data to determine the effectiveness of podcasts as a teaching medium in enhancing listening skills.	• The research found a significant difference in listening comprehension between students who were taught using podcasts and those who were not, with a significance score of 0.002, indicating that the use of podcasts positively impacted students' listening skills. • The study concluded that podcasts serve as an enjoyable medium for teaching listening skills, suggesting that incorporating this technology into the curriculum can enhance students' engagement and comprehension in listening activities.
Curnia Karim, Dyah Setyowati Ciptaningrum (2019)	**Developing multimedia-based listening materials for the tenth-grade students**	Tenth-grade students at MAN 1 Pamekasan, focus on a particular educational level allowed the researchers to tailor the materials to the specific needs and learning styles of these students	The study employed a research development model based on Brach (2009) to create supplementary multimedia-based listening materials for tenth grade students. The materials were developed in accordance with the scientific approach outlined in the Curriculum of 2013, and the final product was delivered as a macro-media flash file included on CDs.	The study developed supplementary multimedia-based listening materials for tenth grade students, which were presented in a macro-media flash file format attached inside CDs, aligning with the scientific approach of the Curriculum of 2013. Evaluation and try-out results indicated that the materials were engaging in terms of topics and listening activities, successfully motivating students to enhance their listening skills.

Author(s) (Year)	Title	Sample	Methodology	Findings
Jihan Humayyed Muhammad Al-Swat Al-Otaibi (2019)	**The Effectiveness of Using Multimedia in Developing the English Language Listening Skills of Intermediate Female Students**	Population is 72 intermediate female students, divided into two groups: an experimental group with 39 students from two intact classes and a control group with 33 students from one intact class. The study employed a non-equivalent group design for sampling, which involved using existing classes rather than randomly assigning students to groups.	• The study employed a non-equivalent group design, which included two groups: an experimental group consisting of two intact classes with 39 students and a control group consisting of one intact class with 33 students. • The effectiveness of multimedia, specifically animations with subtitles, was assessed by comparing the listening skills achievement test results of both groups after the experiment, using ANCOVA tests for analysis.	The study found that using multimedia, specifically animations with subtitles, significantly enhances the English language listening skills of Saudi intermediate female students compared to traditional audio recordings. Results from ANCOVA tests demonstrated that the experimental group, which utilized multimedia, showed a higher level of improvement in listening skills achievement compared to the control group that did not use multimedia.

Author(s) (Year)	Title	Sample	Methodology	Findings
Rashed Alghamdy (2019)	**Does Interactive Multimedia Strategy Improve Listening Skills better than Vocabulary Skills**	• The population sample size for the study consisted of 40 male students, aged 11-13 years, who were in level six at an elementary government school in Al-Baha City, Saudi Arabia. • The sampling method used in the study was a quasi-experimental design, which involved comparing an experimental group that received instruction through interactive multimedia strategy with a control group that was taught using traditional learning methods.	• A quasi-experimental design study was applied for one month at an elementary school in Saudi Arabia, where participants were randomly assigned to either an experimental group (using interactive multimedia strategy) or a control group (using traditional learning methods). • Data was collected using quantitative techniques, specifically through pre-test and post-test English achievement tests to measure the outcomes of EFL learners in listening and vocabulary skills.	• The study found that EFL learners who were taught listening skills through the interactive multimedia strategy showed statistically significant improvements in their listening skills compared to those taught using traditional methods, with a p-value of 0.010 indicating strong evidence of effectiveness. • In contrast, the research indicated that there were no statistically significant differences in vocabulary skills between the experimental group and the control group, as evidenced by a p-value of 0.531, suggesting that the interactive multimedia strategy was more effective for enhancing listening skills than vocabulary skills.

Author(s) (Year)	Title	Sample	Methodology	Findings
Sarah Babaei, Siros Izadpanah (2019)	**Comparing the effects of different advance organizers on EFL learners' listening comprehension: Key vocabularies, previewing comprehension questions, and multimedia annotations**	The study focuses on English as a Foreign Language (EFL) learners, indicating that the participants are likely students who are learning English in a non-English speaking country. This group is essential for understanding how advance organizers can aid in listening comprehension, which is a critical skill in language acquisition. In summary, while the specific details about the population size, age, or educational background are not provided in the contexts, it is clear that the study targets EFL learners who are engaged in improving their listening comprehension skills. The focus on advance organizers suggests a consideration of various learner needs within this population.	• The paper investigates the effects of different Advance Organizer activities, which serve as pre-listening supports, on EFL learners' listening comprehension. These activities include key vocabularies, previewing comprehension questions, and multimedia annotations. • The study aims to determine how these various Advance Organizer methods can help reduce the difficulty of listening, which is a fundamental and challenging component of second language learning.	• The study investigates the effectiveness of different Advance Organizer activities, such as key vocabularies, previewing comprehension questions, and multimedia annotations, in enhancing EFL learners' listening comprehension skills. • The findings suggest that utilizing Advance Organizer activities can significantly reduce the difficulty of listening tasks for second language learners, thereby improving their overall comprehension.
Ratih Krisnoviani, Sulistyani (2022)	**Using Project-Based Learning Model to Promote Students' Listening Comprehension at Vocational High School**	• The population sample size for the research consisted of 31 eleventh-grade students from the 2nd Multimedia class at Vocational High School PGRI 2 Kediri during the academic year 2021-2022. • The sampling method used in the research was purposive sampling, which involves	• The research employed a quantitative approach using an experimental design, specifically a pre-experimental design with a One Group Pretest-Posttest model. This involved conducting a pre-test before the treatment and a post-test after the treatment to	• The research found a significant effect of the implementation of the project-based learning model on students' listening comprehension skills, as indicated by the data analysis showing a p-value of 0.00, which is less than the significance level of 0.05. This suggests that the project-based learning approach effectively

	selecting a specific group of individuals based on certain characteristics or criteria relevant to the study.	measure the impact of the project-based learning model on students' listening comprehension skills. • Data collection was carried out using purposive sampling technique, focusing on a specific group of 31 eleventh grade students from the multimedia majors. The methodology included stages such as administering pre-tests, implementing project-based learning through group work, and conducting post-tests to evaluate the students' listening comprehension improvements.	enhances listening skills among vocational high school students. • The students' learning outcomes improved, with an average value of 75.68 recorded after the implementation of the project-based learning model, demonstrating an increase in their listening comprehension abilities following the pre-test and post-test assessments.

The Impact of Multimedia Learning Models in Listening Comprehension

Multimedia learning models have a significant impact on listening comprehension, as evidenced by various studies that explore different multimedia approaches. The use of multimedia annotations, such as textual and pictorial glosses, has been shown to enhance listening comprehension among language learners, with textual-pictorial glosses being particularly effective (Zarei & Oruji, 2019). Similarly, multimedia-based song media has been found to improve listening skills, with students responding positively to the integration of songs with subtitles, which aids in understanding native speakers (Jannah et al., 2019). Then, audiovisual inputs, such as those reviewed in a systematic literature review, provide authentic language contexts and stimulate interest, which are crucial for effective listening comprehension (Shaojie et al., 2022). The incorporation of YouTube videos as supplementary material also demonstrates a positive effect on listening comprehension, as students exposed to multimedia environments perform better on listening tests (Chien et al., 2020). Podcasts, another form of multimedia, have been shown to significantly enhance listening skills, providing an enjoyable medium for students (Oktaviani & Thresia, 2021). Furthermore, multimedia strategies, including animations with subtitles, have proven effective in developing listening skills among intermediate students, outperforming traditional audio recordings (Al-Otaibi, 2019). Interactive multimedia strategies have also been found to improve listening skills more effectively than vocabulary skills, highlighting the potential of multimedia to enhance specific language abilities (Alghamdy, 2019). Additionally, project-based learning models that incorporate multimedia elements have been shown to significantly improve listening comprehension skills, indicating the versatility and effectiveness of multimedia in educational settings (Krisnoviani & Sulistyani, 2022). Overall, these studies collectively underscore the positive impact of multimedia learning models on listening comprehension, offering diverse and engaging methods to enhance language acquisition.

Table 4. Reviewed Article

Author(s) (Year)	Title	Sample	Methodology	Findings
RQ.2 *What role do self-efficacy and technology integration play in this relationship?*				
Arnon Hershkovitz, Ella Daniel, Yasmin Klein, Malka Shacham (2023)	**Technology integration in emergency remote teaching: teachers' self-efficacy and sense of success**	• Population sample size: 735 K-12 teachers in Israel • Sampling method: Not provided in the text.	• Quantitative study with 735 K-12 teachers in Israel • Decision-tree models used to analyze nuanced relations	• Experience with technology promotes teachers' sense of success. • Emotional difficulties in emergencies may hinder success.
Sari Setiawati, Ikhsanudin, Dwi Riyanti (2023)	**Self-Efficacy in English Listening**	• One seventh-grade student as the sample size. • Purposive sampling method used for selection.	• Qualitative case study with descriptive qualitative analysis • Participant observation, documentation collection, and semi-structured interviews used as instruments	• High self-efficacy in English listening observed in the student. • Positive traits include consistency, support system, and self-confidence.
Nur Anneliza Abd Latip, Iziana Hani Ismail, Wardatul Akmam Din, Suyansah Swanto (2022)	Exploring the students' perception of listening self-efficacy in the context of listening test and real-life communication	• Sample size: Eighteen students interviewed. • Sampling method: Purposeful sampling used for depth.	• Qualitative approach • Purposeful sampling	• Five aspects facilitate students' listening self-efficacy: repetition, language proficiency, speaker delivery, setting, non-verbal communication. • Listening self-efficacy impacts comprehension in tests and real-life communication.

Author(s) (Year)	Title	Sample	Methodology	Findings
RQ.2 *What role do self-efficacy and technology integration play in this relationship?*				
Mustafa Caner, Sinan Aydin (2021)	**Self-efficacy beliefs of pre-service teachers on technology integration**	• Sample size: 439 pre-service teachers participated voluntarily. • Sampling method: Convenience sampling used for participant selection.	• Non-experimental quantitative research design • Self-administered Likert-type survey with demographic questions	• Pre-service teachers have high self-efficacy in technology integration. • Significant differences in self-efficacy based on majors and grade levels.
Antonio R. Yango (2023)	**Technology integration skills, technostress, and self-efficacy of selected public elementary teachers in District III of Batangas city**	• Population sample size: 153 teachers from District III. • Sampling method: Descriptive-correlational with survey questionnaire.	• Descriptive-correlational method • Survey questionnaire as main data source	• High level of technology integration skills among teachers. • Low level of technostress and high self-efficacy reported.
Muhsin Sarikaya (2022)	**An Investigation of Music Teachers' Perceived Self-Efficacy for Technology Integration**	• Population sample size: 216 music teachers • Sampling method: Not specified in the provided text	Personal information form Likert type scale (Technology Integration Self-Efficacy Scale)	• Music teachers' perceived self-efficacy for technology integration was moderate. • Self-efficacy differed by gender, age, and school type.

Author(s) (Year)	Title	Sample	Methodology	Findings
RQ.2 *What role do self-efficacy and technology integration play in this relationship?*				
Qais Al-Hammouri, Malak Mohammad Ghaith, Jawhara D.Abueita, E. Ababneh, Asmahan M.Altaher, Jassim Ahmad Al-Gasawneh, & Ayman Mansour. (2022)	**The influence of using youtube videos on efl learners: the moderating role of technological self-efficacy**	• Sample size: 352 valid surveys from five schools. • Sampling method: Quantitative method used for data collection.	• Quantitative method • Structural Equation Modeling (SEM)	• YouTube videos positively impact EFL learners' skills. • Technological self-efficacy moderates the relationship with learning outcomes.
Ernest Afari, Fuad Ali Ahmed Eksail, Myint Swe Khine, Shaima Ali Alaam (2023)	**Computer self-efficacy and ICT integration in education: Structural relationship and mediating effects**	• Sample size: 267 pre-service teachers from Bahrain. • Sampling method: Convenience sampling for easy accessibility.	• Convenience sampling was used to select participants for the study. • Structural equation modeling (SEM) was used for data analysis.	• Computer self-efficacy influences pre-service teachers' technology use intentions. • Basic and advanced technology skills mediate traditional technology use.
Yu Li (2020)	**Use Micro-Lectures to Increase Self-efficacy in English Listening**	This paper did not explicitly mention a specific sample or participant group in the provided contexts. However, it discusses the general context of English learners, particularly focusing on adult students who may struggle with traditional learning methods	• Use of micro-lectures for targeted English learning. • Incorporation of video-assisted instruction to enhance listening skills.	• Micro-lectures enhance self-efficacy in English listening skills. • Students prefer targeted online resources for improving listening strategies.

Author(s) (Year)	Title	Sample	Methodology	Findings
RQ.2 *What role do self-efficacy and technology integration play in this relationship?*				
Frank C. Gomez, Jesus Trespalacios, Yu-Chang Hsu, Dazhi Yang (2021)	**Exploring Teachers' Technology Integration Self-Efficacy through the 2017 ISTE Standards.**	• Sample size: 327 teachers completed the survey. • Sampling method: Random sample from Southern California Catholic schools.	• Survey instrument based on TICS version 2 • Items generated in alignment with ISTE (2017) Standards for Educators	• Teachers have fair confidence in technology use and integration. • Continuous professional development improves teachers' technology self-efficacy.

The Role of Self-Efficacy and Technology Integration Play in This Relationship

Self-efficacy and technology integration play significant roles in enhancing listening skills, particularly in educational settings. Self-efficacy, defined as the belief in one's ability to execute tasks successfully, is crucial for students' listening comprehension and overall language acquisition. High self-efficacy in listening encourages students to engage more persistently with challenging tasks, employ diverse strategies to overcome obstacles, and maintain motivation, as demonstrated in studies involving English learners (Setiawati et al., 2023) (Latip et al., 2022). Technology integration, on the other hand, provides innovative tools that can enhance listening skills. For instance, the use of YouTube videos has been shown to positively impact EFL learners' listening and speaking skills, with technological self-efficacy moderating this relationship by reinforcing learners' engagement with such tools (Al-Hammouri et al., 2022). Moreover, online micro-lectures, which are short and targeted, can improve learners' self-efficacy in English listening by boosting their confidence and motivation (Li, 2020). Teachers' self-efficacy in technology integration is also pivotal, as it influences their ability to effectively incorporate technology into teaching practices, thereby enhancing student learning experiences (Hershkovitz et al., 2023) (Caner & Aydin, 2021) (Yango, 2023). Studies have shown that teachers with high self-efficacy in technology integration are more likely to adopt and utilize technology in ways that make learning more interactive and engaging (Yango, 2023) (Sarikaya, 2022). However, challenges such as technostress can arise, potentially impacting teachers' self-efficacy and satisfaction (Yango, 2023). Overall, fostering both self-efficacy and technology integration skills among teachers and students is essential for improving listening skills and educational outcomes in the digital age.

D. Conclusions

In conclusion, this systematic literature review reveals that the integration of multimedia learning models significantly enhances listening comprehension by providing diverse, engaging, and interactive tools that cater to different learning preferences. Methods such as project-based learning, digital narrative media, multimedia glosses, and song-based media have been proven effective in improving students' auditory skills. Moreover, the use of audiovisual inputs, YouTube videos, and multimedia annotations further enriches the learning experience by offering authentic contexts and increasing engagement. Additionally, self-efficacy plays a critical role in fostering motivation and persistence in language learning, while technology integration, including micro-lectures and dynamic assessment, serves to boost both listening skills and learner confidence. Overall, combining multimedia tools with supportive environments and self-efficacy can lead to significant advancements in listening comprehension in English language education.

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