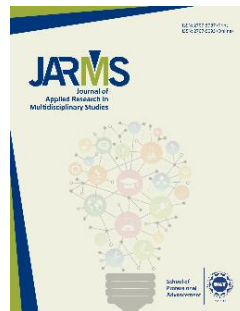
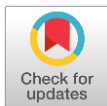


Journal of Applied Research and Multidisciplinary Studies (JARMS)

Volume 7 Issue 2, Fall 2026

ISSN(P): 2707-5087, ISSN(E): 2707-5095

Homepage: <https://journals.umt.edu.pk/index.php/jarms>



- Title:** Enhancing English Language Skills Through Audio- Visual Technology in Higher Education: A Sequential Exploratory Study
- Author (s):** Shelva Shareen
- Affiliation (s):** IVY College of Management Science (ICOMS), Lahore, Pakistan
- DOI:** <https://doi.org/10.32350/jarms.72.02>
- History:** Received: March 10, 2026, Revised: June 25, 2026, Accepted: July 27, 2026, Published: October 12, 2026
- Citation:** Shareen, S. (2026). Enhancing English language skills through audio- visual technology in higher education: A sequential exploratory study. *Journal of Applied Research and Multidisciplinary Studies*, 7(2), 30–60. <https://doi.org/10.32350/jarms.72.02>
- Copyright:** © The Authors
- Licensing:**  This article is open access and is distributed under the terms of [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/)
- Conflict of Interest:** Author(s) declared no conflict of interest



UMT

A publication of
School of Professional Advancements
University of Management and Technology, Lahore, Pakistan

Enhancing English Language Skills Through Audio-Visual Technology in Higher Education: A Sequential Exploratory Study

Shelva Shareen* 

IVY College of Management Sciences, Lahore, Pakistan

Abstract

This study examines the perceived effectiveness of audio-visual (AV) materials in enhancing English language skills among university students in Lahore, Pakistan. This research takes a sequential exploratory mixed-methods approach, where the researcher first collects data using a qualitative approach with a descriptive design, and then a quantitative approach with an experimental design. The initial phase involved a qualitative analysis of five English language teachers' responses gathered through semi-structured interviews. A qualitative phase comprising of interviews was followed by a quantitative phase with 60 graduate and postgraduate students. Thematic analysis was used to analyse the qualitative data, and descriptive statistics were used for quantitative data. The results showed that AV supports were found to have a significant impact on improving learner engagement, comprehension and motivation in all four language skills. Students reported that multimedia tools provided better learning that was more accessible and interactive. The study also found no environmental benefits for the participants, when compared with the traditional teaching approach. However, the study shows that the usefulness of these tools relies greatly on the competence of the teacher and the pedagogical use of them. The study suggests that AV aids are very useful supplementary tools, but not substitutes for the conventional textbook.

Keywords: audio-visual aids, cognitive theory, ELT pedagogy, higher education, mixed-methods, Pakistan

Introduction

Teaching allows for creativity and innovation in an educator's personalized pedagogical styles. Audio-visual (AV) aids are some of the effective ways of improving student learning because they offer an interactive and entertaining learning environment to students. AV aids assist teachers to enhance delivery of lesson and facilitate active learning so that students can

*Corresponding Author: Shelva.Shareen.lhr@rootsivy.edu.pk

be able to apply the concepts on real life situations and think critically about the learning subject. A good teacher tends to use AV to make the lessons interesting and memorable. Multimedia-based education (MBE) or audio-visual education is the approach to the delivery of educational material based on audio-visual media to enhance understanding and the memory of the material (Priya et al., [2025](#)). Their systematic use in English pedagogy at university level, however, is little known and researched, especially on the basis of their communicative outcomes in Pakistan.

English is a global language; it is commonly spoken in most countries and is a major necessity for education, media, government, and business. As the dominant global lingua franca, it functions across diverse geographic and cultural contexts to grant individuals widespread access to academic, technological, and professional knowledge. English proficiency allows students to link themselves with the world in their homes, newspapers, television, radio, and digital media (Ahmed et al., [2024](#)). Children learn language through listening and speech, before moving onto reading, and writing. Correspondingly, the emphasis in the second language learning should, however, start first in oral communication and then move onto writing and reading. The oral practice enables the learners to mimic the right utterance, have a sense of accomplishment, and encourages the process of acquiring more knowledge. AV can facilitate such processes in English classes because it offers real-life listening and speaking practice, which are necessary to develop communicative competence (Ahmed et al. [2024](#); Priya et al., [2025](#)).

In Pakistan, the level of English in English-media and government or semi-government schools differs significantly. Students in English-language schools are usually exposed to communication in English at the initial level, and the emphasis is placed on oral communication rather than on written skills. On the other hand, government institution students can be eloquent in English, but they are reluctant to speak because they lack fluency or confidence. The major emphasis of many teachers is still placed on rote learning and preparing students to pass exams, in the process, overlooking oral skills and language habits development. It results in students having the vocabulary, but being unable to effectively apply the language in practice in real-life communication (Az-Zuhriyah & Irmayani, [2025](#)). As a result, communicative and active means of learning are needed in which AV aides are utilized to make language learning significant,

interesting, and practical.

The issues of the Pakistani educational system include lack of resources, development of the teaching techniques, and the absence of technological use (Qadeer et al., [2024](#)). Proper distribution and utilization of AV aids could help to facilitate the performance, motivation, and understanding of students to a large extent. AV aids, such as whiteboards, multimedia presentations, videos, smartboards, charts, and handouts, facilitate active learning, critical thinking, and creativity. The policies on national education, including the National Textbooks and Learning Materials Policy of 2007, emphasize that quality learning materials and AV aids are essential to enhance the learning outcomes of students. However, despite these efforts, research on AV assistance in university level English classes in Pakistan is limited, which stresses the need for context specific research.

Purpose and Significance of the Study

The research is pragmatic because it seeks to determine the use and the advantages of AV aids in English language teaching. Although different teachers use different methods in classes, the focus on AV aids is less in universities, even though they can help bridge the gap between the theoretical approach to teaching and the actual process of communication. In this paper, the researcher is concerned with the advantages of AV in enhancing language competencies and interest among the learners, through a sample taken from different universities in Lahore. In order to determine how these tools can bridge the gap between theoretical instruction and communicative practice, the study particularly focuses on higher education institutions in Lahore. Whiteboards, multimedia, videos, smartboards, charts, and handouts can be discussed as AV aids, because they play a role in the development of listening, speaking, reading, and writing skills (Nuraini et al., [2024](#); Priya et al., [2025](#)).

Problem Statement and Study Gap

A persistent challenge within the Pakistani educational context is the systemic reliance on rote learning, which impedes the development of authentic communicative competence in English. While university students are often able to use enough words in their speech, they do not have the fluency and confidence required for spontaneous real-life communication. Az Zuhriyah and Irmayani ([2025](#)) stated that the ability to communicate in real life is important. According to the current literature, the challenge lies

not in a general lack of resources and technological integration, but in specific deficiencies related to resources and the integration of technology. There is a research gap in the empirical literature on introducing AV technology to bridge the gap between Theoretical knowledge and practical language use in higher education institutions. This study addresses this gap by examining the perceived and observed efficacy of AV tools in this specific academic setting.

Objectives and Research Questions

The aims of this research are:

- To investigate the role of AV technology in enhancing English language acquisition among university students.
- To analyze the impact of AV aids on student motivation and classroom engagement.
- To examine the extent to which AV aids facilitate the development of the four core language skills.
- To explore student perceptions regarding the utility of multimedia tools in their learning process.

Research questions include

- How does AV technology contribute to the development of English language skills in a university classroom?
- In what ways does the use of AV aids influence student motivation and engagement during the learning process?

Significance of the Study

This study is useful to English language instructors, learners, and prospective researchers. Upon comprehending the efficacy of AV aids, educators can maximize the involvement in the classroom setting, foster the active learning process, and increase the level of communicative competence of learners. Students would enjoy enriched learning experiences, bringing about confidence, creativity, and the ability to practically practice the language skills (Al Aqad et al., [2021](#)). Moreover, this paper can serve as a guide to policymakers and higher learning institutions wanting to adopt technology-enriched teaching to enhance the English learning results in Pakistan.

Scope and Limitations

Two universities in Lahore, Kinnaird College for Women and Government College University Lahore, are the subject of the study. There were 60 students and six classroom observations in the sample because of the time and administration factors. The possible subjectivity of qualitative data, the few observed classes, and the setting of the study to particular university contexts are some of the limitations. Irrespective of these limitations, the study offers useful information to the research on AV aid usage and its influence on learning the English language.

Literature Review

In contemporary second language acquisition, audio-visual (AV) aids are widely recognized as effective tools for language learning. It has been shown that multimedia materials help improve the level of learner engagement, understanding, and retention when used properly in the classroom (Maulida & Hadi, [2022](#)). AV materials are beneficial because they help stimulate both sensory and visual modalities, promoting deeper cognitive processing and the development of long-term memory. Specifically, the integration of these materials addresses the limitations of transient auditory information by providing a persistent visual anchor, thereby reducing the cognitive load on the learner. This dual-channel enhancement demonstrates that structured multimodal immersion inside higher education settings directly reinforces a student's retention capacity by establishing overlapping pathways for language processing (Rahmanu & Molnár, [2024](#)).

Recent empirical research proves that audiovisual materials have a positive impact on vocabulary development and listening comprehension. Indicatively, Ahmed et al. ([2024](#)) reported that the vocabulary retention rates of students exposed to audio-visual materials were significantly higher than that of students taught in conventional ways. On the same note, a meta-analysis study of audiovisual media in EFL listening showed that the positive influence of the multimedia instruction on listening skills (effect size = 0.78) is strong, and confirms the significance of combining visual and auditory information in language classrooms.

The input of the visual is so dominant in language learning since learners process images more effectively as compared to sole text. According to Snigdha and Akter ([2023](#)) audiovisual material enhanced

reading comprehension and pronunciation accuracy in EFL learners. Moreover, the exposure through audiovisual pedagogy allows having indirect cultural contact with native speakers and, therefore, develops sociolinguistic competence and intercultural awareness (Serrano, [2023](#)). Moreover, dealing with these socio-cultural dynamics is a pedagogical challenge and an opportunity for language teachers with multicultural classrooms in the modern world (Hossain, [2024](#)).

The current research is based on Richard Mayer's Cognitive Theory of Multimedia Learning (CTML). The theory assumes that information is received by the human brain in two major ways: by hearing and by sight. Learning will take place when both ways are stimulated at the same time, but not exceeding the learner's cognitive capacity. The framework will help to better understand the role of AV tools from basic whiteboards to sophisticated digital simulations. Using instructional design that is aligned with the brain's processing of multimedia helps to go beyond memorization to conceptual understanding.

Blackboard is one of the oldest and most widely used audiovisual tools. In English language classrooms, blackboards, chalk, and textbooks are still utilized because they are inexpensive and ready to use. Whiteboards function similarly but let teachers use various colored markers, which draws students in and makes lessons more interesting. In the current teaching context, these tools act as the main scaffolding tools, externalizing the thinking process by highlighting the key words and real-time diagrams. Smart interactive whiteboards, the digital version of scaffolding, have been developed, supporting students to capture, organize, and provide context to target words during live instruction (Wong et al., [2024](#)).

A contemporary type of audiovisual aid, multimedia presentation, combines text and images to promote learning. Improved memory, increased active learning, and effective information presentation are all made possible by multimedia, which keeps students interested. Multimedia-enhanced instruction increases EFL learners' motivation, oral proficiency, engagement, and overall language achievement, according to recent research (Nasab & Rahimi, [2023](#)). This aligns with the dual-coding theory, suggesting that the simultaneous presentation of verbal and non-verbal information reinforces memory pathways.

Videos allow students to see how native speakers use language and

pronounce words correctly, as well as to gain confidence, improve listening comprehension, and access content that increases motivation. By providing authentic visual and auditory input, English-subtitled videos in EFL classrooms enhance students' speaking, listening, and vocabulary skills (Oktapiani et al., [2024](#)). This structural advantage is also supported by systematic evidence from around the world showing that video-centric platforms and films can be very powerful tools to overcome cultural barriers and improve situational motivation in second language classrooms (Sánchez-Auñón et al., [2023](#)). Moreover, films offer important sociolinguistic information such as signs, gestures, intonation, etc., which is unavailable in text-based instruction. This is echoed in recent research on contemporary streaming technologies, which have provided highly-priced immersive contexts for conversational listening comprehension (Ulya & Saraswati, [2026](#)). Furthermore, empirical evidence reveals that the integration of these authentic audiovisual aids and structured lesson plans directly contributes to the achievement of students' performance and oral proficiency outcomes in the classroom (Hamzah et al., [2024](#)).

Computers and CALL tools significantly improve language learning outcomes. The internet significantly improves English language learning by offering new learning environments and boosting motivation (Wang et al., [2023](#)). These digital platforms enable a teacher-centered approach to the classroom by giving way to a learner-centered approach that allows students to explore and learn independently. This intentional structural shift highlights the direct link between a student's technical capability and his/her individual independent learning skills in the validation and psychological acceptance of technology-enhanced teaching (Scheel et al., [2022](#)).

According to recent research, English textbooks are still essential for teaching languages because they offer structured content (Khan & Shah, [2024](#)). Technology is used for the engagement, and textbooks are used for the systematic curriculum framework. In this study, textbooks are considered as not a substitute but a partner of the AV technology in a blending learning model.

Current literature provides a solid foundation of support that AV aids are not simply an 'add-on' in a 21st century English classroom. The existing research, however, reveals another important 'pedagogical gap': the effectiveness of the tools is not intrinsic to the technology itself but is dependent on the teacher's strategic integration of the technology. While the

majority of prior research in the Pakistani context remains purely descriptive, this study addresses this empirical gap by evaluating student and teacher perceptions through the theoretical lens of the Cognitive Theory of Multimedia Learning (CTML) within higher education institutions in Lahore.

Methodology

Research Design

This study was conducted using a sequential exploratory mixed-methods design, grounded structurally within a pragmatic research paradigm. Pragmatism as an epistemological stance is highly suited for educational research, as it prioritizes actionable, real-world solutions to pedagogical problems over rigid ideological divisions, allowing the researcher to combine qualitative depth with quantitative breadth (Creswell & Creswell, [2018](#)).

The sequential exploratory framework is also purposeful as it allows for the initial exploratory, qualitative study of teacher experiences to lay the groundwork for the development and validation of the quantitative student survey instrumentation (Shannon-Baker, [2016](#)). The next quantitative phase, designed to help practitioners understand the instructional strategies and systemic issues they encounter, then becomes a genuinely context-specific instrument with regionally meaningful measurement of more general student trends (Greene, [2007](#)).

Participants and Sampling

A dual tier sampling strategy was used for both strands of data, qualitative and quantitative, to get a complete picture of the academic environment. Five English language teachers were selected through purposive sampling in the initial phase of the study, which was qualitative. Purposive sampling was essential to engage information-rich participants who possess specialized, firsthand experience in active instructional delivery within the higher education language sector (Patton, [2015](#)).

In contrast, the next quantitative phase employed convenience sampling techniques to collect information from 60 graduate and postgraduate students ($n=60$) taking English lessons in university education. Convenience sampling is a non-probability sampling approach that has been defended in the field of education research owing to the practical

considerations of access to classrooms, scheduling, and institutional availability, and to provide a very reflective snapshot of the student cohorts who are actively participating in the classroom in the relatively small and constrained urban environment (Etikan et al., [2016](#)).

Respondent Profile

A detailed demographic profile of students taking part in the research was created to ensure data transparency and analytical accuracy. These background variables are crucial since there can be significant differences in age, academic maturity, and gender distribution, which can have a significant impact on a learner's digital literacy and their cognitive ability to absorb audio-visual information (Flick, [2023](#)).

Table 1

Demographic Profile

Variable	Category	Frequency (f)	Percentage (%)
Gender	Male	28	46.7%
	Female	32	53.3%
Age	18–22 Years	41	68.3%
	23+ Years	19	31.7%
Academic Level	Undergraduate	38	63.3%
	Postgraduate	22	36.7%

Instrumentation and Reliability

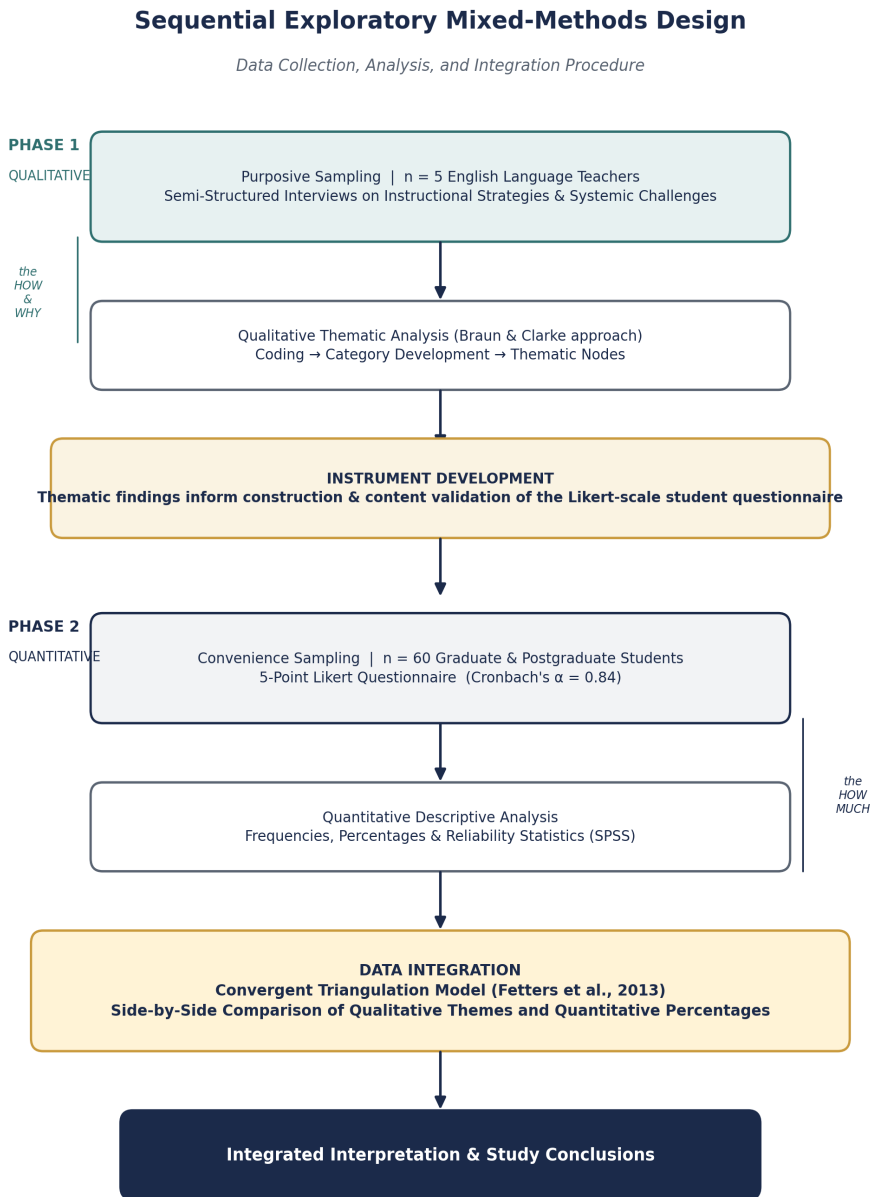
The main quantitative data collection tool was a structured student questionnaire which had a standard 5 point Likert scale ranging from 1 (*Strongly Disagree*) to 5 (*Strongly Agree*). Behavioral and educational evaluations are commonly used to measure abstract psychological perceptions, attitudes, and motivation levels by using Likert scale configurations, which translate abstract perceptions, attitudes, and levels of motivation into clear and quantifiable data points for statistical testing (Boone & Boone, [2012](#)).

A reliability analysis was conducted before the instrument was widely used to ensure the instrument's structural stability. Cronbach's Alpha coefficient for the tool was 0.84. A Cronbach's alpha of >0.80 is considered to have good internal consistency in a psychometric test and academic assessment, implying that the scores of each item of the questionnaire measure a similar cognitive construct with minimal measurement error

(George & Mallery, [2024](#)).

Figure 1

Integration Process of the Study



Data Integration

Mixed methods research is the close and systematic linkage of the data streams, rather than relying on the data being treated as separate studies. Finally, at the highest level of interpretation, a convergent triangulation model (Fetters et al., [2013](#)) was used to process the data for data integration. This model is a side-by-side comparative one, in which the qualitative thematic nodes that were formed based on the teacher interviews are directly compared to the quantitative descriptive percentages that were obtained from the student surveys. Synthesizing qualitative narratives that explain the underlying mechanisms with quantitative metrics that capture empirical breadth achieves robust data triangulation, mitigating the single-method biases of each approach to rigorously substantiate the study's conclusions (Guetterman et al., [2015](#)). The integration procedure, from initial teacher sampling through to the final triangulated interpretation, is illustrated in Figure 1.

Research Hypotheses

This study is based on the theoretical framework of Cognitive Theory of Multimedia Learning (CTML) and tests a set of hypotheses related to the integration of AV in the higher education system in Lahore.

This statistical validation finds a close match with the foundation theories of multimedia based education (MBE), which state that learning language is best achieved with the presentation of materials through two channel processing (Priya et al., [2025](#)). In the realm of higher education, university students exhibit a clear and positive bias in favor of digital content, which they prefer to be structured in order to improve their overall competencies (Ulya & Saraswati, [2026](#)). Empirical studies have shown that the technology mediated configuration is a strong support for the learning shift as it is the one that could provide immediate increase in the general language competence for the senior university students when it is used in place of static learning environment of the lecture (Al Aqad et al., [2021](#)). These integrated multimedia tools lead students to systematically reinforce communication framework, so that there is a direct positive relationship between presenting the digital classroom and the student variables of achievement.

H1: Audio-visual aids play an important role in enhancing English language competency among students at the university level.

This result aligns with known psychological and behavioral theories in digital pedagogy, which show how digital tools actively support student learning trajectories that are self-directed and independent, thereby fostering students' engagement in learning processes naturally (Scheel et al., [2022](#)). Unlike the teacher-led monologue teaching methods, multimedia presentation is an interactive, vivid and entertaining teaching method that can fascinate and attract students more toward the teaching content (Priya et al., [2025](#)). Importantly, in the particular context of Pakistani HE, the digital autonomy that occurs during autonomous use of digital language facilitates students' internal psychological drive to use the language, as students' internal psychological drive grows exponentially in the successful autonomous use of digital language content (Wang et al., [2023](#)). This constant psychological reinforcement offers a straightforward explanation of how the level of student engagement and interest is increased as a result of the use of multimedia stimulation.

H2: The application of the audio-visual aids leads to a significant increase in student motivation and engagement.

This finding is rooted in the Cognitive Theory of Multimedia Learning (CTML) of Richard Mayer, which outlines that multimodality of learning leads to lower cognitive load and enables deeper mental modelling construction. Multimodal learning is not just a rote learning tool or a strategy of abstract memorization, but it enhances cognitive processing and supports the building of long-term memory structures by introducing several sensory inputs (Rahmanu & Molnár, [2024](#)). At a local level, empirical evidence in the Pakistani EFL context shows that audio-visual integration in a targeted manner is much more effective in optimizing lexical retention and contextual word recognition than memorization tasks (Ahmed et al., [2024](#)). Since simultaneous processing of both sensory modalities does not involve the usual short-term memory failures, there is a clear causal relationship between structured audio-visual stimuli and permanent recall of text.

H3: The use of audio-visual aids improves students' comprehension and long-term retention of language learning material.

This comprehensive development is highly consistent with macro-level statistical data confirming that subtitled visual media achieves a robust, positive effect size across the simultaneous acquisition of speaking,

listening, and reading skills (Oktapiani et al., [2024](#)). For listening and speaking skills, English-subtitled films provide authentic auditory inputs that successfully bridge the gap between seeing a word and hearing its native intonation (Oktapiani et al., [2024](#)). Furthermore, in the reading and writing domains, visual scaffolding eliminates structural barriers to accelerate receptive literacy (Nuraini et al., [2024](#)), while interactive visual workspaces and smartboards help adult learners physically group, organize, and process specific target vocabulary strings during formal guided writing tasks (Wong et al., [2024](#)). Since balanced multi-sensory inputs systematically scaffold both receptive inputs and expressive outputs, the data directly supports a multi-dimensional relationship across all literacy competencies.

H4: Audio-visual aids play a significant role in developing the four language skills (listening, speaking, reading, and writing).

The validation of this baseline confirms that there is a clear pedagogical transformation in the attitudes of modern learners with regard to the use of technology-based learning environments as compared to the traditional learning environment based on textbooks (Al Aqad et al., [2021](#)). Students perceive multimedia instructional tools as more engaging, relatable, and conceptually accessible. In the traditional teaching model, the students' listening is passive, and monotonous, and they feel bored and distant from the teacher's language (Rahmanu & Molnár, [2024](#)). The widespread preference by students for this indicates the sharp difference between the requirements of the traditional learning method based on rote memorization, and the nature of the learning resources available in the 21st century, which are multimedia-based (Az-Zuhriyah & Irmayani, [2025](#)). With today's students' higher clarity and satisfaction scores in learning through digital delivery, a strong behavioral link to technological exposure and student structural preference is warranted.

H5: Students are more inclined toward audio-visual-based learning than traditional teaching techniques.

The reason for this decrease in the use of textbooks is because it can enable teachers to externalize the process of thinking dynamically by using multimedia tools with real-time annotations, diagrams, and authentic visual materials (Nuraini et al., [2024](#); Priya et al., [2025](#)). If the classrooms are limited to classroom texts that are printed in English, it is common for non-

native learners to experience problems at the level of textual decoding when they try to understand the texts' message (Snigdha & Akter, [2023](#)). The use of digital spaces (DR) and live-action video inputs (AV) has enabled the traditional textbook to be replaced as the only source of language input, thereby creating a pedagogically alternative approach to language input: visual scaffolding, which is more effective in providing language input than the traditional textbook (Nuraini et al., [2024](#)). A logical inverse relationship can be seen as a result of the dynamic multimedia content, which directly meets the informational needs of the audience in real time, and consequently reduces the need for traditional books on the screen.

H6: The use of audio-visual aids significantly decreases the dependence on textbooks by students.

This critical baseline highlights that, as technology tools are structurally present in the classroom, they are not sufficient to help students succeed in learning. This is because the white board and digital interfaces are only effective as scaffolding tools that only support learning when the lesson logic is externalized by the teacher (Nuraini et al., [2024](#); Priya et al., [2025](#)). However, without specialized pedagogical training in multimedia learning, instructors risk underutilizing these tools by deploying them as passive entertainment rather than as structured cognitive learning instruments. Thus, the key to maximizing language acquisition in all four language skills is to use media in a conscious and strategic way, while simultaneously encouraging students to actively work on communication skills (Snigdha & Akter, [2023](#); Wong et al., [2024](#)). Because technological hardware is of course, very dependent on the instructor's pedagogical decisions in terms of gaining value, so the success of the media in the classroom is dependent on the teacher in question.

H7: The effective implementation of AV technology is significantly dependent upon teacher pedagogical competence and instructional strategies.

Results

Hypotheses Assessment Analysis

This study involved testing seven core research hypotheses that were developed from the Cognitive Theory of Multimedia Learning (CTML) as the primary operational objectives of this study. These results are found to be empirically distributed with a high degree of support for technology-

mediated frameworks and critical pedagogical issues surrounding independent hardware deployment.

Table 2

Empirical Status of Research Hypotheses

Hypothesis	Operational Statement	Final Empirical Status
H1	AV improves skills	Supported
H2	AV increases motivation	Supported
H3	AV improves comprehension	Supported
H4	AV develops four skills	Supported
H5	Students prefer AV	Supported
H6	AV reduces textbooks	Partially Supported
H7	AV works independent	Unsupported

The rejection of H7 (Unsupported) is a critical finding. It empirically proves that AV tools cannot be used effectively without having the teacher's pedagogical skills and the strategic design of the lesson.

Evaluative Analysis of Students' Perceptions

The quantitative survey collected perceptual information from university students ($n=60$) to determine their pre-existing situation and perception regarding the usefulness of multimedia systems in their language classes.

Table 3

Distribution of Students' Perceptions towards AV Integration

Evaluative Perceptual Statement	Agree	Neutral	Disagree
AV aids are used in classrooms	81%	17%	2%
Universities use electronic media	85%	11%	4%
AV aids are helpful in learning	89%	7%	4%
AV aids improve four language skills	60%	32%	8%
AV aids reduce the use of textbooks	57%	36%	7%

From the descriptive distribution, it is seen that the presence of media in the classroom is very large, with an average of 81% of the respondents stating that electronic media were used actively in the classroom and 85% of them saying that their universities were regularly using electronic media. Furthermore, across the survey items evaluating instructional utility, an 89% majority consensus among respondents affirmed that audio-visual

tools are generally helpful in language acquisition.

When moving to macro-skill development, however, the operational data shows more nuances: 60% explicitly agreed that the AV tools systemically support all four language skills; 32% were neutral. In addition, the partial support for H6 is addressed here, as a significant proportion (36%) abstained from answering the question regarding whether the digital tools do actively diminish their structural dependence on printed textbooks.

Structural Mapping of Classroom Multimedia Tools

The study calculated the frequency distribution of some particular audio visual tools which were later being used by the teachers in the higher education institutions in Lahore to understand the technical scenario of the institutions.

Table 4

Frequency and Penetration Rates of Specific AV Tools

Ranked Audio-Visual Tool	Percentage Actionable Usage (%)
Multimedia Projectors	24%
Internet Facilities	21%
Traditional Blackboard	19%
Visual Charts	15%
Digital Video Inputs	10%
Television Displays	7%
Audio/Voice Recordings	4%
Interactive Smart Boards	Minimal

As seen in the structural breakdown, the main motivators for digital delivery in local classrooms are Multimedia Projectors (24%) and Internet Facilities (21%). Intriguingly, the traditional blackboard also has a strong showing at 19%, beating down the standalone Videos (10%) and Recordings (4%). Importantly, Interactive Smart Boards were used at a Minimal level in the sampled tracks, meaning that there is an infrastructure challenge that interactive touch-displays have not yet been used to replace passive projection systems.

Operational Duration of Instructional Media Exposure

The study measured the exact temporal distribution of audio-visual exposure within standard university lecture blocks to evaluate the intensity

of digital integration.

Table 5

Temporal Allocation of AV Media per Lecture Block

Duration Category / Exposure Window	Sample Percentage Allocation (%)
Short Exposure Window (15–20 mins)	30%
Sustained Core Integration (45 mins)	44%
Extended Continuous Exposure (1 hr+)	16%
Zero Exposure (Not used)	10%

The results indicate that 44% of the classes had an integrated 45-minute period of AV material; the most prevalent instructional model. In contrast, 30% of classrooms featured shorter exposure windows of 15 to 20 minutes, which were primarily employed as introductory framing or concluding supplementary activities. Traditional lecture methods were used for all 10% of the sampled cohorts and 16% of sessions lasted for more than 1 hour of continuous exposure.

Qualitative Thematic Extraction from Faculty Interviews

In order to triangulate the quantitative student percentages, five English language teachers were interviewed, using semi-structured format. Six main semantic nodes emerged from the thematic analysis of the textual transcripts.

Table 6

Inductive Code Matrix of Qualitative Themes

Master Thematic Node	Operational Classroom Dimension
Comprehension	Attainment of clear, multi-sensory understanding
Retention	Cognitive conversion into improved long-term memory
Motivation	Cultivation of increased interest and curiosity
Skills Development	Target tracking across listening, speaking, reading, and writing
Confidence	Mitigation of performance anxiety to increase active participation
Building Classroom Interaction	Evolution from passive lectures to a dynamic environment

Empirical Triangulation of Classroom Observations

Empirical triangulation of classroom observations was undertaken. Structured classroom observations were recorded on five measures of active behavioral changes as a direct objective measure of improvement in addition to participants' self-reports.

Table 7

Observational Distribution of Student Behavioral Metrics

Evaluated Behavioral Category	Great Extent	Some Extent	Limited Extent
Learner Confidence	40%	40%	20%
English Language Fluency	50%	40%	10%
Contextual Knowledge Acquisition	80%	20%	0%
Syllabus Aligned Objectives	80%	20%	0%
Spontaneous Student Interest	90–100%	—	—

The observation matrix shows high levels of spontaneous Student Interest (90-100% across the sessions observed). The scores for both of the Contextual Knowledge Acquisition and Syllabus Aligned Objectives were very high with a manifestation of 80% to a Great Extent. The scores for deeper shifts, however, such as Learner Confidence (40% Great Extent) and English Language Fluency (50% Great Extent) were more spread out, verifying that these more complex shifts take longer, more multiple exposure windows to mature.

Core Mixed-Methods Convergent Integration Analysis

By matching qualitative narrative evidence with quantitative data points, the convergent triangulation model reveals exactly *how* these variables interact in the classroom.

Language Acquisition and Auditory Input Mapping

The physical evidence of faculty tracking acoustic development and the qualitative findings from the baseline in Table 2 go hand in hand, confirming that there were direct improvements in student skill levels for 60% of the students. Observers in the field report that some phonetic patterns cannot be reproduced with traditional text configurations:

“Students' pronunciation is incorrect in the native language; 2) AV aids

provide the students with the required auditory input.” (Teacher 1)

This narrative aligns with the 60% student agreement rate, demonstrating that digital audio-visual resources bridge the gap between orthographic text recognition and authentic spoken pronunciation, thereby transforming passive structural knowledge into active communicative competence.

Concept Clarity and Cognitive Load Reduction

The theme of comprehension and structural scaffolding corresponds to the student utility score, with 89% finding AV tools helpful with learning. Faculty members clearly agree that abstract grammar and complicated sentence structure is better understood with visual frames:

“Complex structures become transparent when visualized.” (Teacher 4)

Statistically, this visual externalization explains why 80% of classroom observations tracked Contextual Knowledge Acquisition to a Great Extent. Visual aids reduce the cognitive load on short-term working memory, allowing students to process complex linguistic schemas with ease.

Classroom Motivation and Behavioral Engagement

The ceiling effect is observed on student interest (90-100%) at the same level as it is observed on institutional availability (85%). With the introduction of multimedia tools, teachers find that classroom dynamics begin to change immediately, which is in line with this behavioral change:

Quantitative Metric	Corresponding Qualitative Observation
90–100% Student Interest (Table 7)	<i>"Classroom interaction increases and students become active participants rather than observers."</i> — (Teacher 2)

This convergent mapping shows that the use of the multimedia components helps to alleviate the monotony of traditional lecture setups. The technology turns passive observers into active participants, thereby boosting students' internal motivation and confidence in using the language orally.

Macro Skill Development and Pedagogical Priorities (H4 & H5)

Table 3 reveals that 60% of students agree that AV tools, as an

educational resource, are helpful for all four language skills (H4), while the observation matrix (Table 7) reveals that building the language skill of English Language Fluency (50% Great Extent) is more difficult to achieve than Knowledge Acquisition (80% Great Extent). This shows that there are differences between the reaction to the skills of language and digital media. This is emphasized by Teacher 3 who points out that the reading and listening inputs are highly accessible where they are presented visually, but speaking production is not so easily accessed unless targeted, interactive activities are provided:

The use of visual slides and video is very effective in developing the vocabulary reception, but if no intentional effort is made to require the students to speak after the visual presentation, the media only brings comfort to the listener and not the speaker. (Teacher 3)

This insight is what makes H5 (Students prefer AV) fully supported with an 89% general helpfulness rating despite the longer time needed for changes in raw fluency scores. Using technology mediated environments reduces the hassles of initial text decoding, and thus decreases the level of anxiety in the classroom. But, to make that preference a reality in terms of balanced development of all four macro skills, an active communicative loop is needed.

Textbook Reliance and Resource Optimization (H6)

The remaining data in Table 3 (57% agreed with the statement with a large 36% being completely neutral) partially supports the hypothesis (H6) that AV reduces students' dependency on textbooks. This division demonstrates how digital resources do not supplant books, but rather transform the way in which those resources are used. Teacher 5 describes how digital and paper resources are integrated in local classrooms:

Students still use their physical textbooks for deep reading practice and practise their writing one by one, but the multimedia projector is used as the main tool to set the scene, introduce the true native scene, and present complex strings of vocabulary. (Teacher 5)

This is a qualitative context that presents a 36% neutrality rate. Technology is not being adopted to replace print material in higher education classrooms in Lahore. Rather it serves as a visual scaffolding to introduce and provide context (24% Multimedia usage in Table 4), whereas traditional textbooks are a consistent source of quiet study and independent

work.

Teacher Competence and Independent Tool Isolation (H7)

Total rejection of H7 (AV works independent) validates that physical presence of hardware can't create academic success alone. Table 4 exhibits high penetration rates for Multimedia (24%) and Internet Facilities (21%), while Table 5 indicates that 10% of classrooms report no exposure, even though they have access to the tech. This means that integration is completely reliant on the personal digital skills of the instructor.

In cases where the instructor is not trained in multimedia learning design, devices are frequently used as background fillers. This is in line with the 20% Limited Extent rating for students' confidence in Table 7. Teacher 3 and Teacher 5 are both convinced that technology is only effective when the teacher is actively involved in the teaching process. When media does not have an objective that is directly connected to learning objectives per week (80% aligned objectives in table 7), learning would be less focused, whereas if there is no chance for students to pause for reflection, use teacher-created worksheets, or structural grouping, then students would passively watch the media. This integration analysis verifies that a tool's cognitive value is determined completely by the teacher's conscious pedagogical decisions, and supports the fact that H7 was unsupported.

Discussion

The results of this study can be used to provide empirical evidence of the effectiveness of AV integration in the higher education sector of Lahore, moving beyond mere perception to the underlying cognitive processes. These results confirm the multimedia learning theory and are consistent with the latest studies that reveal that technology-enhanced learning raises the motivation and understanding of learners (Maulida & Hadi, [2022](#); Sánchez-Auñón et al., [2023](#)). The high rate of student agreement (89%) about the helpfulness of AV tools (Table 3) can be understood in terms of the 'dual-coding' mechanism of the Cognitive Theory of Multimedia Learning (CTML) by Richard Mayer. AV aids are not only visual, but they simultaneously engage the auditory system, which means that they have the potential to lessen cognitive load and promote deeper processing of linguistic information, unlike traditional lectures based on texts. Students also claimed that learning with AV tools was simpler and more engaging, which supports the fact that multimodal learning improves comprehension,

vocabulary learning, and communicative abilities because it offers many sensory inputs and strengthens cognitive processing (Rahmanu & Molnár, [2024](#)). This clear preference by students for the use of technology-mediated teaching/learning settings over conventional classroom delivery settings at the college level is explicitly confirmed in higher education language learning assessments (Al Aqad et al., [2021](#)). The findings support recent empirical work that demonstrated that simultaneous reading-while-listening tasks generally yielded better memory retention, concept clarity, and lexical acquisition than isolated reading tasks (Serrano, [2023](#)), and this shift validates the recent shift toward Multimedia-Based Education (MBE) that strategically incorporates digital media to fundamentally reorganize classroom teaching to improve memory retention and concept clarity over conventional lecture methods (Priya et al., [2025](#)). Moreover, the regional correlation is very much similar to the empirical findings from the neighboring contexts of South Asia (i.e. EFL) proving that the systematic exposure to visual media deliberately removes textual decoding barriers and significantly boosts reading comprehension scores of non-native learners (Snigdha & Akter, [2023](#)).

The pervasive use of computers, internet, and multimedia presentations in the classroom is a clear sign of the overall digital transformation in higher education institutions spread throughout Lahore. Table 4 shows that multimedia projectors represent the most frequently utilized hardware, accounting for 24% of classroom technology use, whereas high-tech interactive smart boards remain underutilized across local campuses. The qualitative teacher interviews elucidate the underlying reasons for the quantitative outcomes, contextualizing why 60% of students reported improvements in their language skills (Table 3). In addition, Table 5 reveals that although 44% of lessons use media for 45 minutes or more, a significant 10% of classrooms still have no technological exposure in the lessons. Teacher 1 emphasized that audio-visual technology provides authentic auditory input, which offers a critical pedagogical advantage over conventional textbook reading by exposing learners to natural phonological models. This teaching method is very well able to turn passive knowledge of word recognition into active, communicative knowledge. The results of these insights are directly related to recent evaluations which have shown that university students clearly have a positive partial preference for structured broadcasting of public speaking and high-utility digital content in multi-sensory skill development (Ulya & Saraswati, [2026](#)).

Moreover, this analysis highlights the fact that the interventions in this study, which are based on multimedia technologies, actively promote the capabilities of oral performance, which have been described as a source of situational performance anxiety for ESL learners, and one of the most important factors that hinders increased communication behaviors. In addition, the present analysis reveals that the interventions used in the study activate ESL learners' oral performance capabilities which are identified as a cause of situational performance anxiety, and one of the most important factors that obstruct the increased willingness of ESL learners to communicate in a professional academic environment (Hatami-Nasab & Rahimi, [2023](#)).

The process of improvement in each of the multiple language domains reveals that visual scaffolding is not only effective in helping learners to follow the paths of listening but also to build up the structures of receptive literacy and expressive oracy among students at higher education levels (Nuraini et al., [2024](#)). It is an interactive benefit that is particularly noticeable in the expressive structural domains, as previously shown empirical studies indicate that an interactive visual workspace and smartboards aid learners in grouping, organizing and processing specific vocabulary strings during formal guided writing (Wong et al., [2024](#)).

Most importantly, this growth of vocabulary is consistent with the local context of the Pakistani EFL realm, thus establishing that the targeted AV integration is a great tool for optimizing lexical retention and contextual word recognition, as compared to abstract memorization strategies (Ahmed et al., [2024](#)). The empirical triangulation is further supported by the macro level statistical data that indicates that the integration of subtitled visual media has a strong positive effect in the process of speaking, listening, and lexical acquisition in foreign language study in the adult domain (Oktapiani et al., [2024](#)).

It has been demonstrated that digital tools facilitate the process of self-directed and autonomous learning (Scheel et al., [2022](#)). Specifically, in the Pakistani higher education sector, this digital autonomy directly leads to increased academic self-efficacy, implying that the more students can maneuver digital language media independently, the more their psychological confidence in their communicative competence will be enhanced (Wang et al., [2023](#)).

A significant data conflict is also found for textbook dependence (H6). The majority of students (57%) feel AV technology decreases the importance of textbooks, but the neutral responses (36%), and teacher feedback indicate that AV technology is complementary to textbooks, not substitutive. As in the past research on textbooks and teaching materials, the present research confirmed that books are still a core factor in educational institutions. This is in line with the current provincial evaluations, which have determined that traditional English textbooks continue to serve as important structural frameworks for the delivery of a systemic curriculum for the fulfillment of localized instructional goals even in the face of technological development (Khan & Shah, [2024](#)). This implies the support of blended pedagogical strategies by AV aids, which are complementary, instead of substitutes. The 'creative engagement' provided by AV tools is academically structured with the scaffolding provided through textbooks.

The efficiency of the AV aids was observed and it was concluded that much of this depends on the competence and pedagogical use of the AV aids by the teacher. As Hypothesis H7 ('AV works independent of teacher') is unsupported, it offers a critical insight into the learning mechanism. The effectiveness of the technology is not a quality inherent in the technology itself, but is a quality afforded to the teacher who can 'scaffold' the content. The students were attracted to the interactive teaching of the fluent teachers who had good pronunciation, knowledge about the subject, and a good command of the language. This finding is in line with the findings of previous literature that have found that technology does not automatically improve the learning process, it only works well if the teacher is knowledgeable and prepared (Maulida & Hadi, [2022](#)). It underscores the importance of how classroom dynamics provide adaptive opportunities for teachers, thus indicating that a teacher's strategic action is the one that can resolve local educational problems (Hossain, [2024](#)).

Ultimately, it appears that AV aids serve as 'pedagogical bridges', based on both student observations and teacher feedback. They take students out of the 'rote learning trap' as mentioned in the Pakistani context and give conceptual clarity which is visualized (Teacher 4). Overall, the findings can be considered in the context of the current literature, as they confirm that AV not only promotes the acquisition of language skills but also plays a role in the development of learner autonomy, confidence, and participation in the classroom in the context of Pakistani universities.

Limitations and Future Research

The research is also limited and there are areas for further investigation. This study has some drawbacks. The research was carried out in a limited context of two universities of Lahore. This regional specificity is also important because the results would only represent the academic culture of the specific region, but would not necessarily reflect the other socio-economic and technological variations that exist in other provinces of Pakistan. Besides, percentages, as described by the reviewer, give evidence of 'perceived' improvements but not of any 'proven' causation. The study could be improved in the future by using bigger and more heterogeneous samples at other levels of education. Empirically measuring the effects of specific AV tools on standardized proficiency scores using quasi-experimental pre- and post-test formats would be a benefit to future research. Moreover, if the teachers' 'digital pedagogy' training could be explored, it would give a more objective assessment of the effectiveness of the instruction.

Recommendations

The following are some recommendations for better systematic utilization of AV aids in the Higher Education sector of Lahore on the basis of the findings of this study:

- Pedagogical Integration is the emphasis that needs to be placed on teacher training and professional development moving beyond mere technical operation. Teachers should be instructed to use CTML principles to ensure they do not overload their students' minds by aligning AV content directly to the lesson goals.
- The use of AV material could be regularized in the English syllabus in education authorities. The use of some form of systematic incorporation of multimedia for listening and speaking skills should be made compulsory to ensure that these are not neglected by traditional rote learning examination.
- Internet facilities and smart boards should be given special consideration in the universities. In resource-poor contexts, however, the smart use of whiteboards and other visual supports should not be demeaned as a “lousy” scaffolding tool.
- Higher education institutions are encouraged to foster a culture of

autonomy-centered learning by providing students with access to digital language laboratories and open educational resources (OER), with the aim to help students practice language skills beyond the classroom.

Conclusion

This study finds that the AV technology acts as a critical 'pedagogical bridge' across the context of higher education in Pakistan, based on the triangulation of students' perception, teachers' experience, and structured classroom observations. These tools make full use of multi-sensory input while effectively reducing the impact of rote learning. The study, however, empirically proves that the effectiveness of the AV is dependent on how the teacher can strategically use it in a sound theoretical framework, and not on the technology itself.

Practical Implications

Teacher Preparedness and Dual-Channel Application: The study suggests that technological infrastructure must be accompanied by specialized pedagogical training. Without a firm grounding in the dual-channel processing principles of multimedia learning, instructors risk deploying audio-visual tools as passive entertainment devices rather than structured cognitive learning instruments.

Overcoming Cognitive Overload: Educators must be trained specifically in instructional design principles to ensure that multimedia inputs balance auditory and visual channels simultaneously without exceeding the cognitive processing capacities of the learners.

Strategic Classroom Integration: Training should extend beyond the basics of operating the hardware to the ways teachers can construct activities in the classroom that involve students in active learning activities with the media to increase the levels of lexical acquisition.

Author Contribution

Shelva Shareen: sole author

Conflict of Interest

The author of the manuscript has no financial or non-financial conflict of interest in the subject matter or materials discussed in this manuscript.

Data Availability Statement

Data of this study will be provided by the corresponding author upon formal request.

Funding Details

No funding has been received for this research.

Generative AI Disclosure Statement

The author did not use any type of generative artificial intelligence software for this research.

References

- Ahmed, T., Shafi, S., & Mahmood, H. (2024). Enhancing vocabulary acquisition in EFL classes: The effectiveness of audio-visual aids. *Annals of Human and Social Sciences*, 5(2), 711–724. [https://doi.org/10.35484/ahss.2024\(5-II-S\)67](https://doi.org/10.35484/ahss.2024(5-II-S)67)
- Al Aqad, M. H., Al-Saggaf, M. A., & Muthmainnah, M. (2021). The impact of audio-visual aids on learning English among MSU third-year students. *English Franca: Academic Journal of English Language and Education*, 5(2), 201–214. <https://doi.org/10.29240/ef.v5i2.3329>
- Az-Zuhriyah, A., & Irmayani, I. (2025). Audiovisual media in EFL listening: A meta-analysis of 21st century learning resources. *Jurnal Ilmu Pendidikan dan Humaniora*, 14(3), 247–257. <https://doi.org/10.35335/jiph.v14i3.208>
- Boone, H. N., Jr., & Boone, D. A. (2012). Analyzing Likert data. *Journal of Extension*, 50(2), Article e48. <https://doi.org/10.34068/joe.50.02.48>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Fetters, M. D., Curry, L. A., & Creswell, J. W. (2013). Achieving integration in mixed methods designs—Principles and practices. *Health Services Research*, 48(6 Pt 2), 2134–2156. <https://doi.org/10.1111/1475-6773.12117>
- Flick, U. (2023). *An introduction to qualitative research* (7th ed.). SAGE Publications. <https://doi.org/10.4135/9781036231712>
- George, D., & Mallery, P. (2024). *IBM SPSS Statistics 29 step by step: A*

simple guide and reference (18th ed.). Routledge.
<https://doi.org/10.4324/9781032622156>

Greene, J. C. (2007). *Mixed methods in social inquiry*. Jossey-Bass.

Guetterman, T. C., Fetters, M. D., & Creswell, J. W. (2015). Integrating quantitative and qualitative results in health science mixed methods research through joint displays. *The Annals of Family Medicine*, 13(6), 554–561. <https://doi.org/10.1370/afm.1865>

Hamzah, M. H., Jeryo, R. A., & Obaid, H. M. (2024). The impact of using audio-visual aids and authentic materials on learners' performance in English classes. *Manar Elsharq Journal for Literature and Language Studies*, 2(2), 19–25. <https://doi.org/10.56961/mejlls.v2i2.650>

Hossain, K. I. (2024). Reviewing the role of culture in English language learning: Challenges and opportunities for educators. *Social Sciences & Humanities Open*, 9, Article e100781. <https://doi.org/10.1016/j.ssaho.2023.100781>

Khan, I. U., & Shah, L. H. (2024). Role of English textbooks in language skills development: A case study of Khyber Pakhtunkhwa. *Pakistan Languages and Humanities Review*, 8(3), 339–347. [https://doi.org/10.47205/plhr.2024\(8-III\)31](https://doi.org/10.47205/plhr.2024(8-III)31)

Maulida, S., & Hadi, M. S. (2022). Using audio visual media to improve English learning outcomes. *Jurnal Studi Guru dan Pembelajaran*, 5(1), 11–15. <https://doi.org/10.30605/jsgp.5.1.2022.1297>

Nasab, Z. H., & Rahimi, M. (2023). The impact of multimedia-enhanced STEAM activities on foreign language learners' development of oracy skills and willingness to communicate. *Bulletin of Education and Research*, 45(2), 67–92.

Nuraini, R., Rambe, M. S., Irwanto, I., Moha, L., & Fiidznillah, R. (2024). The effectiveness of the use of audio visual as a learning media for speaking skills and reading skills of Tsanawiyah students. *Lughawiyah: Journal of Arabic Education and Linguistics*, 6(1), 81–99. <https://doi.org/10.31958/lughawiyah.v6i1.13176>

Oktapiani, I. U., Ilham, I., Humaira, H., Bafadal, F., Adebayo, M., & Fasih, P. (2024). The effectiveness of English-subtitled videos in enhancing speaking, listening and vocabulary skills: A meta-analysis. *Journal of*

- Languages and Language Teaching*, 12(1), 56–71. <https://doi.org/10.33394/jollt.v12i1.9501>
- Patton, M. Q. (2015). *Qualitative research & evaluation methods: Integrating theory and practice* (4th ed.). SAGE Publications.
- Priya, P., Sharma, S., Shanampoodi, G. B., Rajeswari, T. S., Sri Nidhya, G., & Srikanta, M. (2025). Role of technology-based audio-visual aids in English language teaching. *South Eastern European Journal of Public Health*, 25(S2), 4169–4176.
- Qadeer, M., Naz, S., Waseem, S., & Asghar, Z. (2024). Technological lag in Pakistan's education system. *International Research Journal of Arabic and Islamic Studies*, 4(1), 167–182.
- Rahmanu, I. W. E. D., & Molnár, G. (2024). Multimodal immersion in English language learning in higher education: A systematic review. *Heliyon*, 10(19), Article e38357. <https://doi.org/10.1016/j.heliyon.2024.e38357>
- Sánchez-Auñón, E., Férrez-Mora, P. A., & Monroy-Hernández, F. (2023). The use of films in the teaching of English as a foreign language: A systematic literature review. *Asian-Pacific Journal of Second and Foreign Language Education*, 8(1), Article e10. <https://doi.org/10.1186/s40862-022-00183-0>
- Scheel, L., Vladova, G., & Ullrich, A. (2022). The influence of digital competences, self-organization, and independent learning abilities on students' acceptance of digital learning. *International Journal of Educational Technology in Higher Education*, 19(1), Article e44. <https://doi.org/10.1186/s41239-022-00350-w>
- Serrano, R. (2023). Extensive reading and science vocabulary learning in L2: Comparing reading-only and reading-while-listening. *Education Sciences*, 13(5), Article e493. <https://doi.org/10.3390/educsci13050493>
- Shannon-Baker, P. (2016). Making paradigms meaningful in mixed methods research. *Journal of Mixed Methods Research*, 10(4), 319–334. <https://doi.org/10.1177/1558689815575861>
- Snigdha, S. S., & Akter, M. (2023). Effectiveness of audio-visual materials in teaching reading for young EFL learners in Bangladesh: An experimental study. *EIKI Journal of Effective Teaching Methods*, 1(4),

65–82. <https://doi.org/10.59652/jetm.v1i4.84>

Ulya, N. L., & Saraswati, G. P. D. (2026). EFL university students' perceptions of TED Talks as authentic materials for listening comprehension: A qualitative descriptive study. *FOSTER: Journal of English Language Teaching*, 7(1), 208–224. <https://doi.org/10.24256/foster-jelt.v7i1.342>

Wang, Y., Yasmin, F., & Akbar, A. (2023). Impact of the internet on English language learning among university students: Mediating role of academic self-efficacy. *Frontiers in Psychology*, 14, Article e1184185. <https://doi.org/10.3389/fpsyg.2023.1184185>

Wong, W. L., Muhammad, M. M., Ya Shak, M. S., Abdul Rahman, M., Lee, M. C., & Pandian, V. (2024). Employing the smart interactive whiteboard to teach guided writing vocabulary. *Issues in Language Studies*, 13(1), 112–130. <https://doi.org/10.33736/ils.5643.2024>