

# The Application of Multimedia in English Language Teaching: A Mixed-Methods Study in Chinese Higher Education

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## Abstract:

This mixed-methods study investigates the application of multimedia technologies in English language teaching within Chinese universities, focusing on usage patterns, perceived effectiveness, and implementation challenges. Data were collected from 220 students and 15 teachers via surveys and semi-structured interviews. Results indicate that multimedia tools —particularly PowerPoint and video platforms— are widely adopted and are perceived as highly effective in enhancing listening skills, cultural awareness, and student engagement. However, their impact on reading and writing skills is moderate. Key challenges include insufficient teacher training, technical limitations, and cognitive overload. The study concludes that successful integration requires not only technological access but also pedagogical training, thoughtful design, and institutional support. Practical recommendations are provided for educators, institutions, and policymakers to promote sustainable and pedagogically sound multimedia implementation in language education.

## Keywords:

Multimedia Technology, English Language Teaching, Technology Integration, Student Engagement, Cognitive Load, Chinese Higher Education

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## 1. Introduction

The integration of multimedia into English language teaching has become one of the most visible shifts in contemporary higher education. By combining text, sound, visuals, video, animation, and interactive applications, multimedia environments can make language input more concrete, more engaging, and more responsive to different learning needs. In the Chinese higher education context, this shift has gained particular importance because English continues to function as a key academic and professional language, yet many university classrooms still struggle with the limitations of lecture-dominated and test-oriented instruction [1,2]. As universities pursue more flexible and learner-centered approaches, multimedia has increasingly been positioned as a practical way to enrich instruction and create more meaningful opportunities for language use.

The promise of multimedia, however, is not universally realized. On one hand, research grounded in Mayer's Cognitive Theory of Multimedia Learning [3] suggests that well-designed combinations of verbal and visual input can improve

comprehension, retention, and learner engagement. On the other hand, scholars have also warned that technology integration does not automatically produce better learning outcomes. When multimedia is poorly selected, overused, or disconnected from pedagogical goals, it may increase cognitive load, distract learners, and widen inequalities created by uneven infrastructure and teacher readiness [5,6]. These competing possibilities make it important to move beyond general claims about educational technology and look more closely at how multimedia is actually being used in specific instructional settings.

Within English language teaching, the issue is especially relevant because language learning depends not only on content delivery but also on interaction, feedback, context, and sustained practice. Multimedia can support listening, speaking, vocabulary development, and cultural exposure, yet its effectiveness may differ across skill areas and may be shaped by the experience of both teachers and students. Guided by multimedia learning theory [3] and sociocultural perspectives on collaborative learning [4], this study examines the application of multimedia in English language teaching in Chinese higher education. Specifically, it investigates patterns of use, perceived instructional effectiveness, and implementation challenges through a convergent mixed-methods approach that combines survey data with teacher interviews.

## **2. Materials and Methods**

### ***2.1. Research Design***

This study employed a convergent mixed-methods design in order to examine the application of multimedia in English language teaching from both breadth and depth [7]. The quantitative component generated a general picture of multimedia use and perceived effectiveness across a larger student sample, while the qualitative component provided explanatory detail through teacher interviews. The two strands were collected during the same general period, analyzed separately, and then interpreted together during the discussion stage. This design was appropriate because the topic required both measurable patterns and contextual insight into classroom practice.

### ***2.2. Participants***

The study involved 220 undergraduate students and 15 English teachers from three universities in Eastern China. Student participants were selected through stratified random sampling to ensure representation across year levels and different levels of English proficiency, using available College English Test performance bands as a guide. Teacher participants were purposively selected on the basis of their direct experience in using multimedia tools in English classes. This combination allowed the study to capture both learner perceptions and practitioner perspectives.

### ***2.3. Data Collection Instruments***

The primary quantitative instrument was a 35-item Likert-scale questionnaire designed to measure three areas: multimedia usage patterns, perceived instructional effectiveness, and implementation challenges. Items were reviewed for clarity and content relevance before administration, and the instrument obtained a Cronbach's alpha of 0.87, indicating acceptable internal consistency. Demographic items were

also included to describe the respondents' academic background and exposure to multimedia-supported English classes.

The qualitative instrument was a semi-structured interview guide composed of 10 open-ended questions. The interview prompts focused on teachers' actual multimedia practices, the perceived benefits of multimedia for language development, recurring classroom difficulties, and the kind of institutional or professional support needed for more effective integration. The semi-structured format allowed the researcher to pursue comparable themes across participants while still giving room for experience-based elaboration.

#### ***2.4. Data Collection Procedures***

Survey data were collected online over a four-week period using a secure digital form distributed through university communication channels. Prior to the main administration, the questionnaire was checked for wording, flow, and technical accessibility. The interview phase was conducted through Zoom after the survey responses had been gathered. With participant consent, the interviews were recorded and later transcribed for analysis. Each interview lasted approximately 30 to 45 minutes, which provided sufficient time for participants to describe their practices and concerns in detail.

#### ***2.5. Data Analysis***

Quantitative data were processed using SPSS 26. Descriptive statistics, including frequency counts, percentages, means, and standard deviations, were used to summarize patterns of multimedia use and levels of perceived effectiveness. Comparative reading of student and teacher responses was used to identify areas of convergence and divergence in reported challenges. Qualitative data were examined through thematic analysis following Braun and Clarke's framework [8]. Codes were developed from repeated patterns in the interview transcripts and then grouped into broader themes. To strengthen analytic consistency, a second coder reviewed a portion of the transcripts, yielding an inter-coder reliability of 88%.

#### ***2.6. Ethical Considerations***

Ethical approval for the study was secured from the appropriate university review body before data collection commenced. All participants were informed of the purpose of the research, the voluntary nature of their participation, and their right to withdraw at any stage without penalty. Informed consent was obtained prior to the administration of the survey and interviews. To protect confidentiality, identifying information was removed from the dataset, pseudonyms or grouped descriptors were used during reporting, and digital files were stored in password-protected storage accessible only to the researcher.

#### ***2.7. Abbreviations, Acronyms, and Web Links***

Abbreviations and acronyms were defined at first mention in the manuscript in order to maintain clarity for readers across disciplines. Common terms used in this study include virtual reality/augmented reality (VR/AR), Statistical Package for the Social Sciences (SPSS), and College English Test (CET). No abbreviations were used in the article title. In addition, web addresses and platform names mentioned in the study are presented in regular text form only, consistent with publication requirements for manuscript processing.

### 3. Results and Discussion

#### 3.1. Multimedia Tool Usage

PowerPoint (85%) and video platforms (78%) emerged as the most frequently used multimedia tools, while more advanced applications such as VR/AR tools remained limited (15%). The pattern suggests that teachers and students tend to rely on tools that are already familiar, readily accessible, and easier to integrate into existing classroom routines. By contrast, tools that demand greater technical support, preparation time, or institutional investment appear to be used far less often.

*Table 1. Frequency of multimedia tool usage (N=220).*

| Tool             | Often | Sometimes | Rarely | Never |
|------------------|-------|-----------|--------|-------|
| PowerPoint       | 85%   | 12%       | 2%     | 1%    |
| Video Platforms  | 78%   | 15%       | 5%     | 2%    |
| Interactive Apps | 65%   | 20%       | 10%    | 5%    |
| Podcasts         | 40%   | 30%       | 20%    | 10%   |
| VR/AR Tools      | 15%   | 25%       | 40%    | 20%   |

#### 3.2. Perceived Effectiveness

Respondents rated multimedia as highly effective in supporting listening ( $M = 3.45$ ), cultural awareness ( $M = 3.50$ ), and student engagement ( $M = 3.60$ ). Speaking was also evaluated positively ( $M = 3.30$ ), while reading ( $M = 2.95$ ) and writing ( $M = 2.80$ ) received more moderate ratings. These results indicate that multimedia was perceived to be especially valuable in areas that benefit from audio-visual input, contextual exposure, and interactive presentation.

*Table 2. Perceived effectiveness of multimedia (1–4 scale).*

| Skill Area         | Mean | SD   | Interpretation       |
|--------------------|------|------|----------------------|
| Listening          | 3.45 | 0.72 | Highly effective     |
| Speaking           | 3.30 | 0.68 | Effective            |
| Reading            | 2.95 | 0.75 | Moderately effective |
| Writing            | 2.80 | 0.80 | Moderately effective |
| Cultural Awareness | 3.50 | 0.65 | Highly effective     |
| Student Engagement | 3.60 | 0.60 | Highly effective     |

#### 3.3. Implementation Challenges

Teachers reported stronger agreement than students across all identified challenges, particularly in relation to inadequate training (87% versus 60%) and poor technical quality (70% versus 55%). Differences were also visible in perceptions of over-reliance on multimedia, cognitive overload, and limited interaction. The pattern suggests that teachers may be more attentive to the instructional and logistical demands of technology use, whereas students are more likely to experience these issues in terms of classroom convenience, pace, and participation.

*Table 3. Challenges in multimedia implementation.*

| Challenge                | Student Agreement | Teacher Agreement |
|--------------------------|-------------------|-------------------|
| Over-reliance            | 68%               | 80%               |
| Poor technical quality   | 55%               | 70%               |
| Lack of teacher training | 60%               | 87%               |
| Cognitive overload       | 50%               | 65%               |

| Challenge                | Student Agreement | Teacher Agreement |
|--------------------------|-------------------|-------------------|
| Over-reliance            | 68%               | 80%               |
| Poor technical quality   | 55%               | 70%               |
| Lack of teacher training | 60%               | 87%               |
| Cognitive overload       | 50%               | 65%               |
| Limited interaction      | 45%               | 60%               |

**Table 4.** Summary of recurring themes from teacher interviews.

| Theme                        | What participants emphasized                                                                              | Instructional implication                                                            |
|------------------------------|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Purposeful use of multimedia | Teachers favored tools that directly supported lesson objectives rather than tools used for novelty.      | Tool selection should begin with the target language skill and the learning task.    |
| Need for teacher preparation | Participants repeatedly mentioned training gaps in designing and managing multimedia-supported lessons.   | Professional development should focus on both technical and pedagogical integration. |
| Uneven technical conditions  | Internet quality, device access, and platform limitations affected lesson flow and student participation. | Institutional support must address infrastructure alongside classroom innovation.    |
| Value of blended interaction | Teachers noted that multimedia worked best when combined with discussion, feedback, and guided practice.  | Technology should extend, not replace, human interaction in language learning.       |

### 3.4. Discussion

The findings show that multimedia has become part of routine English language teaching practice, but mostly in forms that are practical rather than highly innovative. The heavy use of PowerPoint and video platforms suggests that teachers prefer tools that can be incorporated with minimal disruption to the lesson structure. This helps explain why advanced tools such as VR/AR remain marginal despite their often-cited potential. In real classrooms, accessibility, cost, teacher confidence, and institutional support still shape what can realistically be adopted. This pattern supports earlier observations that technology integration is often driven not only by pedagogical promise but also by feasibility within local conditions [5,6,9].

The reported effectiveness of multimedia was strongest in listening, cultural awareness, and engagement, which is consistent with the nature of those learning outcomes. Audio-visual materials can expose learners to pronunciation, speech rhythm, authentic accents, and cultural cues in ways that printed materials alone cannot easily provide. These results align with multimedia learning theory [3], which argues that learners benefit when information is presented through coordinated verbal and visual channels. At the same time, the more moderate ratings for reading and writing suggest that multimedia is not equally powerful across all language domains. Productive and text-based skills still require guided practice, feedback, and structured language use rather than mere exposure to digital content.

Another important finding is the stronger level of concern expressed by teachers regarding implementation challenges. Teachers are responsible not only for using the tools but also for selecting materials, managing time, maintaining student attention, and ensuring that technology supports rather than replaces pedagogy. Their concern about inadequate training is especially significant because it points to a gap between access to tools and preparedness to use them well. The issue is not simply technological availability; it is pedagogical competence. This reinforces the relevance

of technological pedagogical content knowledge and the broader view that digital integration succeeds when teachers understand how to connect tools with language objectives, learner readiness, and classroom interaction [10].

#### 4. Conclusions

This study demonstrates that multimedia plays a meaningful role in English language teaching in Chinese higher education, particularly in areas that benefit from rich audio-visual support and active classroom engagement. Its strongest contributions were observed in listening development, cultural understanding, and student engagement, while its value for reading and writing was perceived to be more moderate and dependent on instructional design.

More specifically, the study shows that the effectiveness of multimedia is shaped by the kind of tools used, the pedagogical decisions behind their use, and the conditions under which they are implemented. Accessible tools such as PowerPoint and video platforms continue to dominate classroom practice, while advanced technologies remain limited by cost, complexity, and support requirements. The findings also make clear that teacher preparation and institutional support are central to sustainable integration. Multimedia should therefore be treated not as a substitute for sound teaching, but as a pedagogical resource whose value depends on thoughtful selection, clear learning goals, and balanced use.

#### Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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