# Perceptions of VR-Assisted English Language Learning: A Study Among Engineering Students in Visakhapatnam Andhra Pradesh

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**Abstract :** This empirical research examines the attitudes, perceptions, and preparedness of Visakhapatnam, Andhra Pradesh, India-based engineering students towards Virtual Reality (VR)-supported English language learning. As English communication competencies are critical to technical education, the use of immersive tools such as VR offers new prospects for situated and immersive learning. A mixed-methods research approach was followed, merging quantitative data from standardized questionnaires with qualitative data from semi-structured interviews. A total of 150 final-year engineering students from three universities took part in the research. Results show high awareness of VR (89%) but minimal exposure in the classroom (0%). Students were very much in agreement that VR could improve real-life language practice, lower anxiety levels, and enhance motivation. Concern about cost, accessibility, and the training needs of teachers were, however, observed. The research highlights the potential of VR in revolutionizing the education of languages in Indian higher education and provides practical proposals for using immersive tools in English instruction. The research adds to the discourse on digital innovation in language learning with implications for developing countries.

**Keywords:** Virtual Reality, English Language Learning, Engineering Students, Immersive Learning, Learner Perceptions, Technology-Enhanced Education

## 1. Introduction

English language teaching has undergone revolutionary change in the last decade and immersive technologies have been the drivers of innovation. Virtual Reality (VR) holds huge promise to transform the learning of English as it allows learners to experience simulated environments in which the target language is naturally used in context and interaction-based situations. With teachers seeking means to adapt to the digital literacies and experiential learning approach of the 21st-century learner, VR offers a compelling pedagogic tool that enables the use of language for genuine purposes, learner autonomy, and communicative confidence.

In the Indian higher education context—especially among engineering students—English is not merely a subject but a critical skill for academic success and career advancement. Despite exposure to English through traditional classroom instruction, many students struggle with fluency, contextual understanding, and real-time application. This gap necessitates innovative strategies that go beyond rote learning and grammar drills. VR offers one such opportunity by enabling students to navigate virtual scenarios such as job interviews, airport check-ins, and project presentations, thereby enhancing not only their linguistic competence but also their soft skills and cultural awareness.

Although studies in Western and East Asian contexts have explored the impact of VR on language acquisition, limited empirical data is available in the Indian setting—particularly among students from Visakhapatnam, pursuing technical education. Engineering colleges in Visakhapatnam, Andhra Pradesh present a unique demographic with diverse language backgrounds and varying levels of English proficiency. This study aims to bridge that gap by empirically investigating the perceptions and attitudes of engineering students toward VR-assisted English language learning. By focusing on learner feedback and engagement levels, the research hopes to provide a foundation for future implementation of VR technologies in Indian language classrooms.

This paper does not involve direct experimental intervention but relies on empirical methods such as survey analysis to understand learners' experiences and insights. The findings aim to support educators, curriculum designers, and policymakers in making informed decisions regarding the integration of immersive technologies in English language education.

## 2. Review of Literature

**2.1 Evolution of Technology in Language Learning** 2.1 The History of Technology in Language Learning Language learning started its journey from various pedagogical approaches, including grammar-translation, audio-lingual, and communicative language teaching. In the digital era the growth of technologies like multimedia, mobile apps and now Virtual Reality have transformed the process of teaching and learning the language(Warschauer & Healey, 1998). According to some research, technology-assisted language learning increases learner autonomy, motivation, and engagement (Chapelle, 2001).

**2.2 Virtual Reality in Language Learning Contexts** Virtual Reality in Language Learning Contexts Virtual Reality offers an active multisensory experience in education. It mimics real-life environment suitable for genuine interaction and also contextualized learning, which is essential for second language acquisition (Lan, Sung & Chang, 2013). Unlike traditional schools, VR allows learning-by-doing, enabling them to learn actively and practice using the language in real-life scenarios.

**2.3 Theoretical Foundations Supporting VR-ELL Integration** Theories of Instructional Theory Supporting VR-ELL Integration As instructional theory, virtual reality-assisted language learning is founded on the principles of Constructivist learning and Experiential Learning Theory. This is particularly connected to Vygotsky'sSocial Constructivism, which prioritizes the social environment in learning, and where the virtual assumptions applied within are paramount. Kolb's Experiential Learning Theory (1984) validates that experiential, tangible exposure promotes knowledge retention, and better implementation.

**2.4 Empirical Studies on VR and Language Acquisition** Research on the Implementation of VR in Language Acquisition Empirical evidence has contributed toward the increased integration of VR into communication of language around the world. According to Peterson (2006), VR can enhance EFL learners' confidence in speaking and vocabulary. VR was shown to help learners improve their spatial memory and contextual understanding according to the study of Hamilton, McKechnie, Edgerton, and Wilson (2021)

. In particular, their research showed that experiences in VR helped learners cement idioms and conversational phrases in memoryIn Asian contexts, Lin and Lan (2015) found that Taiwanese learners using 3D VR settings exhibited better pronunciation and listening skills. Similarly, a Korean study by Yoon (2019) documented how VR reduced language anxiety among learners, leading to improved speaking fluency.

**2.5 Indian Studies on Educational Technology and ELL** While India has seen increased adoption of digital tools in language education, studies specifically focusing on VR are limited. Research by Ananthakrishnan and Samuel (2019) explored the use of Augmented Reality (AR) and indicated improved learner interaction and enthusiasm. Joshi and Varghese (2021) noted that immersive tools could bridge the urban-rural divide in language learning outcomes, but stressed the need for infrastructural support and teacher training.

**2.6 Perceptions and Attitudes of Learners Towards VR** Understanding students' perceptions is crucial for successful integration. Studies by Huang et al. (2019) and Liu et al. (2020) suggest that learners generally view VR as a motivating and engaging tool that reduces the fear of judgment during practice. In the Indian context, a perception study by Reddy (2020) found that engineering students are curious and receptive to VR, although exposure remains minimal due to cost and accessibility issues.

While global research has demonstrated the effectiveness of VR in enhancing language learning outcomes—especially in terms of speaking skills, learner motivation, and reduced anxiety—most of these studies have been conducted in Western or East Asian educational settings (e.g., Taiwan, Korea, and the U.S.). Moreover, the majority of these investigations have focused on experimental designs with measurable gains, often overlooking student perceptions, readiness, and contextual barriers. Within the Indian context, particularly in technical institutions, studies specifically exploring students' attitudes toward VR integration in English language learning remain scarce. This study aims to address this gap by providing empirical data on learner perceptions, challenges, and willingness to adopt VR, thereby offering context-sensitive insights that can guide future VR integration in Indian language classrooms.

## 3. Objectives of the Study

- To explore engineering students' perceptions of VR as a tool for English language learning.
- To examine students' readiness and willingness to adopt VR in their language learning journey.
- To identify perceived benefits and challenges in using VR for ELL.

## 4. Methodology

### 4.1 Research Design

This study employs a descriptive research design using a mixed-methods approach, combining both quantitative and qualitative techniques. Quantitative data were collected through structured questionnaires with Likert-scale items, while qualitative insights were gathered from open-ended responses and semi-structured interviews. The design is non-experimental and aims to explore learners' perceptions, attitudes, and readiness toward integrating Virtual Reality (VR) into English language learning. The interpretive nature of the study allows for the exploration of subjective experiences, while descriptive statistics provide measurable trends.

### 4.2 Sample Population

The sample consisted of 150 final-year engineering students from three engineering colleges located in Visakhapatnam, Andhra Pradesh, India. Participants were selected using a purposive sampling method, chosen specifically for their exposure to English language instruction in technical education and their varied levels of English language proficiency (basic, intermediate, advanced). This sampling strategy was employed to ensure a diverse range of perspectives and to align with the study's objective of exploring learners' readiness and openness to immersive learning technologies.

### 4.3 Tools and Data Collection

**Data collection tools included:**

A structured questionnaire comprising both Likert-scale items (to measure perception and readiness) and open-ended questions (to capture deeper insights).

Semi-structured interviews were conducted with 10 volunteer participants to further explore students' views, concerns, and expectations regarding VR in language learning contexts.

Data collection was carried out over a two-month period using both online surveys (via Google Forms) and in-person interviews, depending on accessibility and institutional convenience. Ethical considerations, including informed consent, voluntary participation, and confidentiality of responses, were strictly observed.

### 4.4 Data Analysis

Quantitative data were analyzed using frequency distributions and percentage analysis to determine the overall trends in student responses.

For the qualitative component, thematic analysis was employed. Responses from open-ended questions and interview transcripts were coded manually, and emerging themes were categorized into key areas such as perceived benefits, challenges, emotional responses, and anticipated outcomes of VR-based language learning. This approach allowed for triangulation of data and a richer interpretation of students' perspectives.

### 5. Results and Discussion

| Questionnaire | | | |
|---|---|---|---|
| **Section** | **Question No.** | **Question** | **Options/Scale** |
| A: Background Information | 1 | Name (Optional) | Open Text |
| | 2 | Gender | Male / Female / Other |
| | 3 | Institution | Open Text |
| | 4 | Year of Study | 1st / 2nd / 3rd / 4th Year |
| | 5 | Proficiency in English | Basic / Intermediate / Advanced |
| B: Awareness and Experience | 6 | Have you heard of Virtual Reality (VR)? | Yes / No |
| | 7 | Have you used VR in any classroom before? | Yes / No |
| C: Perception and Readiness | 8 | VR can provide a real-life environment for practicing | 5-point Likert Scale (Strongly Agree to Strongly Disagree) |

| | | English. | |
|---|---|---|---|
| | 9 | VR will reduce fear and anxiety while speaking in English. | 5-point Likert Scale |
| | 10 | I am willing to try VR for language learning. | 5-point Likert Scale |
| | 11 | VR will make language learning more enjoyable. | 5-point Likert Scale |
| | 12 | I feel confident in using new technologies in education. | 5-point Likert Scale |
| D: Open-Ended Questions | 13 | What benefits do you think VR can offer in language learning? | Open Text |
| | 14 | What concerns or challenges do you foresee in using VR in the classroom? | Open Text |



Figure 1 Awareness of VR

The pie chart titled **"Students' Awareness of Virtual Reality (students)"** represents the responses to the **sixth question** in the structured questionnaire, which asked students whether they were aware of Virtual Reality (VR). Out of the 150 students surveyed, **133 students (approximately 89%)** reported that they were aware of VR, while **17 students (around 11%)** indicated that they were not familiar with the technology. These findings suggest a **high level of awareness** of VR among the student population, providing a strong foundation for exploring its potential integration into English language learning.

The question titled **"Have you used VR in any classroom before?"** explores the practical experience students have with Virtual Reality in an educational setting. Out of the 150 students surveyed, **all respondents (100%)** indicated that they had **never used VR in any classroom environment**. This suggests that, despite a high level of awareness of VR technology, **its actual implementation in educational contexts remains limited** among the participants.
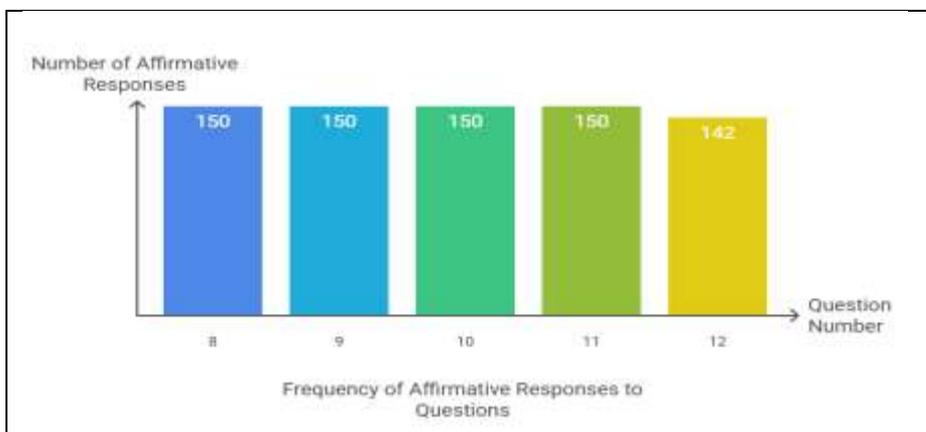
Figure 2 **Frequencies of Affirmative Responses to Questions**

**Figure 2**, titled **"Frequency of Affirmative Responses to Questions,"** presents the responses to **Questions 8 to 12** from the structured questionnaire, which focused on students' **perception, experience, and readiness** toward using Virtual Reality (VR) in language learning. The responses to Questions 8 to 11 showed full agreement (100% affirmative responses from all 150 participants), suggesting a strong consensus on the potential of VR in creating immersive, low-anxiety, and engaging language learning experiences. Question 12, assessing confidence in using VR to improve English communication, had 142 affirmative responses (94.67%), indicating overall enthusiasm but with slight hesitance among a small number of students. Due to the high concentration of positive responses, further statistical breakdown (e.g., mean and SD) was not applicable. However, these findings strongly reflect the readiness and interest of learners in adopting VR in English language education.
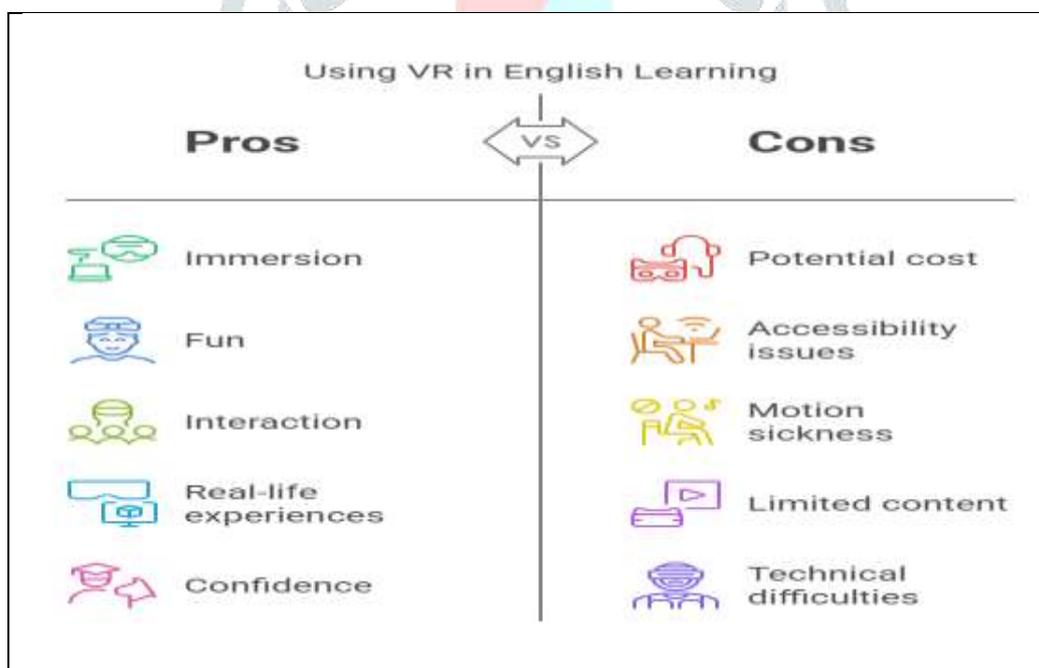


Figure 3 Pros & Cons of using VR

In response to **Question 13**, *"What benefits do you think VR can offer in language learning?"*, many students stated the various advantages that Virtual Reality (VR) offers in language education. Many of the students reported that VR creates an immersive learning environment, it gives the feel of real-life practice for language, it helps enhance interaction as they can have their own real-time experience while conversing, and it makes students more motivated and engaged which becomes fun and interesting for them as it is a new technology. A lot of students also spoke of better retention and fluency as the experiential learning takes place in simulation real-life contexts.

When students were asked, "*What concerns or challenges do you foresee in using VR in the classroom?*" they mentioned a variety of practical and technical issues. Many students mentioned the high cost of equipment, limited access to VR tools, and technical problems like glitches and connectivity issues uncertainty. Students also cited experiencing nausea, especially with longer usage. Another issue was the lack of VR content in the curriculum.

## 8.Conclusion

The study concludes that engineering students in Andhra Pradesh exhibit a notably positive perception toward VR-assisted English language learning. The findings indicate that students recognize the transformative potential of Virtual Reality in enhancing **fluency, contextual understanding, pronunciation,** and **overall learner engagement.** The immersive and interactive nature of VR environments aligns well with students' learning preferences, offering a more dynamic alternative to traditional methods. Despite the enthusiasm, the study also reveals critical challenges that must be addressed to ensure effective implementation. These include the **need for infrastructural support, affordable and accessible VR tools, localized and curriculum-aligned content,** and **comprehensive teacher training.** Without these foundational elements, the integration of VR may remain aspirational rather than actionable. Therefore, the study emphasizes a collaborative effort among educators, institutions, and policymakers to strategically plan for the sustainable adoption of VR technologies in English language pedagogy across higher education settings.

## 9.Recommendations

Based on the findings of this study, the following recommendations are proposed to facilitate the effective integration of Virtual Reality (VR) in English language learning:

- **Implement pilot VR modules** within existing English language laboratories to assess feasibility and learner response.

- **Provide comprehensive training programs** for instructors to build confidence and competence in using VR tools effectively in classroom settings.

- **Establish partnerships with EdTech companies** to develop and customize high-quality, curriculum-aligned VR content tailored to the local educational context.

- **Incorporate regular student feedback mechanisms** to iteratively improve the implementation process and ensure learner-centered development.

## 10.Limitations

While this study provides valuable insights into the perceptions of engineering students toward VR-assisted English language learning, certain limitations must be acknowledged:

- The research was **limited to three institutions** in Andhra Pradesh, which may affect the generalizability of the findings to other regions or educational contexts.

- The study relied on **self-reported data**, which may be influenced by personal bias or participants' understanding of the questions.

- The research did not include **longitudinal tracking** of student performance or engagement, which limits insights into the long-term impact of VR integration on language learning outcomes.

## 11. Scope for Further Research

Future research could explore **experimental studies** that compare the effectiveness of VR-assisted instruction with traditional language teaching methods. Such comparative analysis would help quantify the pedagogical advantages of immersive technology. Additionally, **longitudinal studies** tracking learners' progress over an extended period could offer deeper insights into how VR impacts the development of specific language competencies—such as fluency, pronunciation, and real-time communication. Further investigation into **teacher perceptions, curriculum integration,** and **cost-effectiveness** of VR tools in diverse educational settings would also enrich the current body of knowledge.

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