

REVIEW ARTICLE



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

2395-2636 (Print);2321-3108 (online)

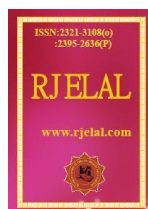
Ecological Sensitization Through Immersive Virtual Reality (IVR) in ESL Classrooms

Bhagya Rajeswari S

Research Scholar, Institute of English, University of Kerala, Kerala, India

Email: bhagyatajeswari.1990@gmail.com

DOI: [10.33329/rjelal.14.4.92](https://doi.org/10.33329/rjelal.14.4.92)



Article info

Article Received: 19/09/2026
Article Accepted:16/10/2026
Published online:25/10/2026

Abstract

The UNEP's vision is to mold a generation of young leaders who are ecologically sensitive, and for this, environmental education and education for sustainable development are the goals.

There have been numerous attempts to incorporate ecology and related themes in the language curriculum to develop ecological consciousness. But these often fall short. With an increasing awareness of impending ecological damage globally, it has become all the more relevant to adopt and adapt approaches for a fast-evolving Gen Z. Traditional classrooms with their limited settings might fall behind in developing an ecologically sensitive learner. However, we are at a juncture where the digital world, familiar to Gen Z, is gaining momentum. This paper seeks to explore the possibilities of integrating Immersive Virtual Reality (IVR) in developing ecological sensitization among learners in an ESL classroom. Immersing in an experience that simulates real-world ecosystems opens immense possibilities to learn. This, in turn, would transform ESL classrooms into dynamic spaces of discussion, ideas, and learning experiences.

Keywords: Ecological consciousness, immersive virtual reality, ESL, sensitization, Gen Z.

INTRODUCTION

Inclusivity is the watchword of this century, and an ESL classroom with its dynamic evolution offers immense scope for practicing this inclusivity. One of the key factors that determine inclusivity in a classroom is through the choice of content. Now the bigger question is, what criteria need to be fulfilled to get

included? Obviously, it is the urgency of the matter. How important, immediate, and urgent is it for the content to be included in the learning process? Identifying such content can be challenging, thought-provoking, and can even test the decisiveness of teachers. A content-based approach can be a constructive approach in this context. However, the approach might be

familiar to the teachers, but they often need help choosing the content. The content chosen in the content-based instruction approach should be relevant and interesting to the learner. According to the United Nations Environment Programme Annual Report 2023, greenhouse gas emissions, temperature hikes, and climate impacts have intensified. '... slow action on the triple planetary crisis of climate change, nature, and biodiversity loss, and pollution and waste is a major driving force.'

Understanding the ecological crisis and the urgency is timely content that could be introduced among young learners. ESL classrooms must not be seen solely as language learning spaces but also as spaces of transformation of learners into responsible citizens of the future. The second challenge could be the factor called 'motivation'. Keeping the learner's interest active and motivated during and after learning. Nevertheless, demotivation among learners is a challenge to be surmounted. Demotivation among learners of language is an active area of study, and numerous studies conducted on the area have resulted in findings like reduced self-confidence and negative attitudes toward the target language, among many others (Kikuchi and Sakai). These learner issues may stem from the content used in the classroom. Bringing content that is interesting and at the same time relevant can be a challenge. Ecology is not a novel concept to be taught inside a classroom; it forms an integral part of ESL coursebooks. However, we are at a juncture where climate consequences cannot be ignored. This paper, therefore, argues for an innovative and contemporary way of introducing ecological content to the learners. Content-based instruction integrating ecology using Immersive Virtual Reality (IVR) could be effective in this area of language learning. This would mean placing the learner in an environment that simulates the real environment in focus and eventually helping them assimilate language through this content.

Literature review

Research on integrating immersive virtual reality (IVR) into the learning process is ongoing. There are studies, however, being conducted that support the possibilities it opens up for the teachers and learners. Cooper et al. (2019) refer to how IVR can enhance learning. It also points to the decline of learners' interest in learning due to the heavy reliance on textbooks. This study also suggests the prospective technique of employing IVR to stimulate and sustain the learner's interest. Chavez and Bayona (2018) present usability, fidelity, and autonomy as key features that make IVR integration into learning effective. The field of science and technology has been taking strides in this area of research with a key focus on identifying features of this technology that will ensure effective learning.

Immersion Programs

Immersion programs, or language immersions, refer to a form of bilingual education where the learner is immersed in the target language (TL) to attain fluency in TL. This method came to prominence in Canada in the 1960s and is considered significantly effective in language learning.

Social-psychological studies comparing immersion and non-immersion students demonstrated that immersion students develop additive as opposed to subtractive bilingualism (Lyster)

When a learner is 'immersed' in the TL, they learn language through several factors. Similarly, 'immersive' content is equally significant here. In a content-based classroom, if the learner is introduced to a topic foreign to him/her, the biggest challenge that lies with the teacher is to make it engaging. Generation Z and their strong roots in the digital space can become an advantage here. The digital space and the scope of learning techniques it offers are immense. Creating immersive content should become less of a challenge here.

Gen Z and the ESL classroom

ELT as an academic discipline is constantly in a state of flux. The sociological aspect of language studies focuses on language in the context of four demographic groups: Baby Boomers, Gen X, Gen Y, Gen Z, and Gen Alpha. Of all these, Gen Z, also referred to as 'Digital Natives,' forms a separate group. They belong to this world of technology, and hence, it is relevant to learn the medium of communication they are part of. Their language, undoubtedly, is heavily influenced by technology and the digital space. Forming a large part of the student community in higher education institutes today, Gen Z and their language use is a matter of thought and research. Traditional classrooms with their limited settings might not succeed in teaching language to them; they steadfastly demand technology-driven techniques inside the classroom. More than being a challenge, this opens up a multitude of opportunities to teach and learn language.

Immersive Virtual Reality (IVR)

It is the simulation of a real-world environment that keeps the user engaged. In the field of education and learning, IVR seems to have a great impact.

The Online Oxford Dictionary defines virtual reality thus: "... computer-generated simulation of a three-dimensional image or environment that can be interacted with in a seemingly real or physical way by a person using special electronic equipment, such as a helmet with a screen inside or gloves fitted with sensors" (Freina and Ott).

Immersive virtual reality goes beyond mere technology integration. The advantages weigh more in terms of ensuring effective learning.

Immersive VR can offer great advantages for learning: it allows a direct feeling of objects and events that are physically out of our reach, it supports training in a safe environment avoiding potential real

dangers and, thanks to the game approach, it increases the learner's involvement and motivation while widening the range of learning styles supported (Freina and Ott).

Inclusivity in ESL classrooms opens scope for practicing inclusivity among learners too.

Disabled people represent a population where immersive VR can really make the difference, especially now that the first affordable HMDs have appeared on the market. In particular, intellectually impaired people can really take advantage of such an approach. Learning in a virtual environment that reproduces the real one can minimize the problems related to learning transfer (Freina and Ott).

One of the most used learning techniques in an ESL classroom is role play. However, it differs from simulation. In role plays, the learners act out roles, but in simulations, they are spatially immersed in a situation or a conflict, generating an 'experience' for them. This experience, in turn, keeps them hooked to the context, inspiring them to participate in creating a discourse.

Simulation activities are looked upon as a leading communicative activity (Dakowska)

Simulation games originated years ago with the so-called 'Pentagon War Games.' Like war games, simulation games for the classroom are replications of a real environment. Social scientists have adopted simulation-games to the classroom to teach not only content such as political science and economics, but also underlying human, social considerations that help shape decision making. (Troyka and Nudelman)

Conventionally, in a simulation approach, the learner has to 'visualize the communicative situation' from the information provided regarding the context. This can lead the learner

to 'lasting experiences' (Dakowska). The simulation approach is therefore best understood through the following criteria:

- Rich situational context
- Extended meaningful materials (sustained discourse)
- Emotional involvement of the participants in the conflict situation
- Mobilizing their language resources to be able to accomplish the negotiation task
- Its open-ended character
- Immersive Virtual Reality (IVR) simulates the real-world situation.

Ecological Sensitization through Immersive Virtual Reality

Today we understand that the job of a language teacher extends far beyond teaching forms and structures of the language. The National Education Policy (NEP) 2020 emphasizes the urgent need to incorporate and implement environmental education and sustainable development.

NEP also advocates the attainment of holistic and multidisciplinary education through flexible and innovative curricula for all Higher Education Institutions (HEIs), which shall include credit-based courses and projects in the areas of community engagement and service, environmental education, and value-based education.

According to the Guidelines and Curriculum Framework for Environment Education at Undergraduate Level proposed by the University Grants Commission,

Environmental education, therefore, needs to include areas such as climate change, pollution, waste management, sanitation, conservation of biological diversity, management of biological resources and biodiversity, forest and wildlife conservation, and sustainable development.

The requirement is well defined by the policymakers. However, the challenge comes in the matter of implementation. The environment and its problems, varying from climate change and pollution to wildlife conservation and many more, can be brought to the classes for discussion through immersive virtual reality, now often referred to as the 'future of classrooms.' ' In IVR, the learner gets to experience the environment or the specific environmental problem in the discussion. The spatial experience, though virtual, achieved by the learner can be extremely effective in understanding the situation being discussed. For instance, in order to discuss a topic like 'Underwater Ocean Pollution,' the learner may be taught using handouts and audio/visual aids, which form an integral part of an ESL classroom. Nevertheless, if the same learner gets to experience it 'spatially' through immersive virtual reality, what it looks like when we say 'Underwater Ocean Pollution' can be twice as effective and long-lasting in their memory. This is because it simulates a real environment, and the learner achieves an individualized experience.

Participating in simulation activities may turn out to be a lasting experience for many students (Dakowska)

The learners are expected to exhibit increased engagement, motivation, and interest in the subject discussed. Experiential learning and its effectiveness in learning have been studied already. The way a learner feels engaged with content through hands-on participation or group work is well-known within the ELT circle. Immersive virtual reality takes it a notch higher. With proper language immersion and integration with immersive virtual reality to understand ecology, learners may show an increased level of sensitivity to ecology and its problems. ESL classrooms are no longer spaces for learning forms and structures of language; they extend far beyond.

Adaptive learning is part of interactive learning which addresses the needs of individuals through learning pathways, effective feedback, and supplemental resources; as opposed to a one-size-fits-all curriculum (Kurt)

Globally, we have become a technology-mediated world, and this has percolated into various mediums as well. The benefits are numerous in a technology-mediated classroom too. Gen Z, who have grown and adapted in a technology-driven world, understands no other language better. To tap into the potential of this moment should be the priority of a teacher.

LIMITATIONS AND CHALLENGES

Technology-supported ESL classrooms are not new. We have adopted technology into our classrooms for the past so many years.

From early grammar-translation and audiolingualism to the later communicative language teaching, all of these methods have implications for how to best integrate technology into the classroom (Warschauer and Meskill)

Nonetheless, it would not be justifiable if we proceed without acknowledging the challenges of embracing a technology-supported ESL classroom. For a long time, since the integration of technology into language classrooms, the biggest challenge has been to ensure proper teacher-technology interaction. The teacher's familiarity with the technology in use and the devices required, and also ensuring an optimum use of technology within the classroom. Numerous studies have shown how using technology can also pose a serious problem of information overload among students. Learners may feel overwhelmed by large amounts of information and become passive receivers of knowledge (Schmid). This would eventually produce passive receivers of knowledge. Hence, ensuring adequate use of technology is the responsibility of the teacher. 'Experiments have shown that, when students were free to choose

how and when to use CALL, their choices could lead to poor learning and wasted time' (Sciarone and Meijer).

Immersive virtual reality can be achieved using Head-Mounted Display (HMD). The device availability and affordability could be an anticipated challenge. However, the greater challenge remains the autonomy of the learner inside the ESL classroom using IVR technology. The teacher may facilitate the learner-technology interaction to ensure proper and optimal use.

CONCLUSION

This paper is only an attempt to inspire research into understanding the potential of immersive virtual reality in content-based instruction in an ESL classroom. Technology-integrated learning, without a doubt, has become one of the most innovative ways of learning in recent times. Gen Z, with their unmatched interest in technology, would find immersive virtual reality classrooms complementing their interests. From bringing the learner in close contact with the real-world environment through simulations to giving them an individualized experience, virtual reality classrooms have a long way to go. There are, however, questions of equity and access that need to be researched. This conceptual paper argues for looking into the scope of immersive virtual reality and its potential to offer personalized experiences for learners in becoming ecologically sensitive to their surroundings.

References

- Cooper, Grant, Li Ping Thong, and Kok-Sing Tang. "Transforming Science Education with Virtual Reality: An Immersive Representations Model." *Educational Media International* 61.3 (2024): 229-251.
- Dakowska, M. (2005). *Teaching English as a foreign language: A guide to professionals*. YDS Publishing.

- Freina, L., & Ott, M. (2015). A literature review on immersive virtual reality in education: State of the art and perspectives. In *Proceedings of the International Scientific Conference on eLearning and Software for Education* (Vol. 1, pp. 133-141).
- Government of India, Ministry of Human Resource Development. (2020). *National education policy 2020*. https://ncert.nic.in/pdf/nep/NEP_2020.pdf
- Kikuchi, K., & Sakai, H. (2009). Japanese learners' demotivation to study English: A survey study. *JALT Journal*, 31(2), 183-204.
- Kurt, S. (2021). *Adaptive learning: What is it, what are its benefits and how does it work?* Educational Technology. <https://educationaltechnology.net/adaptive-learning-what-is-it-what-are-its-benefits-and-how-does-it-work/>
- Lyster, R. (2007). *Learning and teaching languages through content: A counterbalanced approach*. John Benjamins Publishing Company.
- Matovu, Hastings, et al. "Immersive Virtual Reality for Science Learning: Design, Implementation, and Evaluation." *Studies in Science Education* 59.2 (2023): 205-244.
- Schmid, E. C. (2008). Potential pedagogical benefits and drawbacks of multimedia use in the English language classroom equipped with interactive whiteboard technology. *Computers & Education*, 51(4), 1553-1568.
- Sciarone, A. G., & Meijer, P. J. (1993). How free should students be? A case from CALL: Computer-assisted language learning. *Computers & Education*, 21, 95-101.
- Troyka, L. Q., & Nudelman, J. (1975). *Taking action: Writing, reading, speaking, and listening through simulation-games*. Prentice Hall.
- University Grants Commission. (2023, June). *Guidelines and curriculum framework for environment education at undergraduate level*.
- Warschauer, M., & Meskill, C. (2000). Technology and second language learning. In J. Rosenthal (Ed.), *Handbook of undergraduate second language education* (pp. 303-318). Lawrence Erlbaum Associates.