

## Overview

Immersive learning is an innovative approach to education leveraging cutting-edge technology to create engaging and interactive learning experiences. This technology simulates real-world environments and scenarios, allowing students to learn in both the physical and virtual worlds while eliminating distractions. Immersive learning uses a range of technologies, including virtual reality (VR), augmented reality (AR), mixed reality (MR), and three-dimensional (3D) simulations. Coupled with artificial intelligence (AI), immersive learning tools can adjust lesson plans and adapt to students' needs when necessary. These applications are not far-off concepts in development. Immersive learning technologies are live and in use, as they continue to push into traditional education and professional landscapes in revolutionary ways.

- **Virtual Reality (VR):** Virtual reality creates a simulated environment, typically requiring the user to wear goggles, allowing them to feel like they are in a different place. When wearing the VR headset, users can look around and interact with the virtual world as if it were real. An example of VR is Meta's Quest device, a stand-alone headset allowing users to play games, watch movies, and more without needing to connect to a computer. This device enables users to interact with virtual objects and navigate menus using their hands.
- **Augmented Reality (AR):** Augmented reality overlays digital information onto the real world, typically using a smartphone or special glasses. With an AR device, users can see and interact with virtual objects and information superimposed on their physical surroundings. An example of AR is Niantic's Pokémon GO, a mobile game that overlays virtual Pokémon onto the real world using a smartphone's camera. Players can then see and catch Pokémon seemingly appearing in their real-world surroundings.
- **Mixed Reality (MR):** Mixed reality combines the natural and virtual worlds, allowing digital and physical objects to interact and coexist in real time. Using an MR device, such as a headset, users can engage with both physical and virtual environments simultaneously. An example of MR is Apple's Vision Pro, a headset that overlays digital objects and information onto the physical world to provide an immersive experience.
- **3D Simulations:** Three-dimensional simulations are interactive, computer-generated environments that create realistic 3D experiences. These simulations allow users to explore and interact with virtual spaces. An example of a 3D simulation is Redbird's Guided Independent Flight Training simulator, whose environment mimics real-world flying and is used for pilot training.

## Center Forward Basics

Center Forward brings together members of Congress, not-for-profits, academic experts, trade associations, corporations and unions to find common ground. Our mission: to give centrist allies the information they need to craft common sense solutions, and provide those allies the support they need to turn those ideas into results.

In order to meet our challenges we need to put aside the partisan bickering that has gridlocked Washington and come together to find common sense solutions.

For more information, please visit [www.center-forward.org](http://www.center-forward.org)

- **Artificial Intelligence (AI):** Artificial intelligence is a computer's ability to perform tasks that typically require human intelligence. AI-driven algorithms supplement immersive learning technology by creating adaptive learning experiences tailored to individual learners' needs. Integrating AI with immersive learning technologies allows for more personalized, engaging, and effective educational experiences. An example of AI in the context of immersive learning is Mondly VR, a VR app that allows users who want to learn a new language to receive personalized help and real-time feedback.

## Benefits to Education

Immersive learning has the potential to revolutionize education and workforce training. These technologies are used today in healthcare, aviation, and corporate job training to provide realistic simulations and hands-on experiences without the risks or costs associated with real-world practice. For instance, medical students can perform virtual surgeries to hone their skills, military pilots can train in highly realistic flight simulators, and employees can engage in interactive onboarding and skills development programs. Additionally, immersive learning can enhance traditional classroom education by enabling students to explore historical events, scientific phenomena, and complex concepts in a more engaging and interactive manner. As these technologies continue to evolve, the scope and impact of immersive learning are expected to expand, offering even more innovative and effective educational solutions.

Immersive learning environments are often more engaging than traditional methods, capturing learners' attention and making the learning process more enjoyable. Immersive learning encourages active participation where students can manipulate objects, explore new and unique environments, and collaborate with others to gain a deeper understanding of content. The learning can be personalized, adapting to individual learning styles and paces. In a [2022 study](#) on the impact of VR, VictoryXR reported students at Morehouse College who learned using VR had an average final test score of 85. Conversely, students who learned in person without the technology had an average final test score of 78.

Beyond the benefits to education, immersive technologies have potential applications in other industries and use cases. The Southeast Louisiana Veterans Health Care System has even begun using VR to treat patients suffering from anxiety and depression. Providers can use these devices to simulate scenarios and desensitize veterans to anxiety-causing triggers.

## Challenges

Despite its many benefits, these new technologies also pose new challenges. One of the primary challenges is the high cost of implementing and maintaining immersive learning technologies. Additionally, these technologies carry a significant learning curve, requiring extensive training for educators and learners to use them effectively. Technical issues such as hardware malfunctions, software bugs, and the need for high-performance computing resources can also disrupt the learning experience. Furthermore, creating high-quality, relevant, and engaging content for immersive learning environments is a complex and resource-intensive process. Finally, some users experience motion sickness issues and other physical discomforts when using immersive learning tools such as headsets. Addressing these challenges is crucial for the successful implementation of these technologies.

In response to these challenges, individuals and corporations have established initiatives and training programs to teach users, namely teachers, how to use immersive learning products. For example, EdTechTeacher provides workshops, webinars, and consulting services to help teachers integrate [these](#) technologies into their teaching seamlessly. Platforms like Nearpod also provide ready-made VR lessons and tools to develop customized learning experiences to reduce the burden of creating immersive content for teachers.

## The Future of Immersive Learning

As immersive learning technologies become more affordable and accessible, their integration into education and training is expected to become more widespread. The potential for immersive learning to revolutionize fields like remote education, corporate training, and professional development is immense, fostering a more engaging, effective, and collaborative

educational landscape. As society continues to embrace digital transformation, immersive learning is poised to play a crucial role in shaping the future of education and workforce training.

## Links to Other Resources

- Center for Engaged Learning - [Immersive Learning](#)
- Global Silicon Valley - [Shaping The Classrooms Of The Future](#)
- Medium - [How the Metaverse Can Transform Education](#)
- Meta - [New Education Product for Quest Devices Will Help Teachers Bring Subjects to Life in New Ways](#)
- Mondly - [Understanding the Role of Artificial Intelligence in Education & Language Learning](#)
- Stanford Medicine - [Virtual Reality System Helps Surgeons, Reassures Patients](#)
- Tech Target - [Virtual Reality Sickness](#)
- Veterans Association News - [Using Virtual Reality To Treat PTSD](#)
- VictoryXR - [Morehouse College Digital Twin Results](#)