Inclusive XR in the Workplace

How Accessible Immersive Technologies Can Help Employers Upskill and Enable an Increasingly Diverse Workforce
Introduction

Extended Reality (XR) is poised to reshape how businesses work. At its core, XR joins digital content with the physical world. XR platforms can be flexible and personalized, reaching people wherever they are at any moment.

As organizations accelerate their digital transformations, they can use XR to engage employees and customers in new ways. XR creates immersive experiences, allowing people to interact with digital content directly using web browsers, mobile apps, or wearable devices. XR technologies also enable businesses to attract and hire more diverse talent pools.

These technologies have proven benefits for workplaces, including improved job training and enhanced collaboration. To ensure people with disabilities can access these benefits, XR tools must have accessibility features by design. Organizations that prioritize accessibility in the XR technologies they adopt can gain a competitive edge in a tight labor market.

XR Technologies and the future of work

XR will succeed laptops and smartphones to become the next major computing platform. The immersive experiences XR tools create will give people new ways to work and collaborate.

The internet, the physical world, and digitally created virtual spaces have started to combine. XR technologies are now integrated into natural and built environments and embedded within products. Over the next decade, physical and digital infrastructures will come together at an unprecedented scale. These blended environments will create new ways for people to socialize, learn, build, conduct business, and provide services.

The World Economic Forum (WEF) recognizes that society is entering a Fourth Industrial Revolution. As the WEF sees it, the physical and digital worlds will seamlessly overlap in this new period, impacting all disciplines, economies, and industries and resulting in highly personalized immersive experiences and a new Future of Work.

About This Resource

This resource will help anyone who wants to use immersive technologies in the workplace. Each section will help organizations to ensure the immersive technologies they adopt are accessible for all.
Section 1: Inclusive XR in the Workplace

XR Applications
Many organizations adopt XR technologies to assist with training and daily operations. Popular applications include:

- Using virtual tools to train employees on dangerous or difficult tasks.
- Using remote assistance tools to allow experts to help with complex tasks.
- Using XR platforms to overlay instructions onto physical world objects.
- Using XR tools to increase workplace safety and efficiency.

Tools powered by XR can help people with disabilities experience environments, learn skills, and participate in activities in new ways. They can also provide options for people to use when physical environments create barriers.

The Rapid Adoption of XR
Some of the fastest-growing jobs in the U.S. are in industries that are rapidly adopting XR technologies. Those industries include manufacturing, healthcare, job training, retail, and public safety.

Industry leaders indicated that they use XR technologies to:

- Address warehousing and inventory needs.
- Assist with product engineering and design.
- Conduct immersive job training and upskilling.
- Monitor healthcare patients virtually.

Terms to Know

**Virtual Reality (VR)**
Replaces a user’s real surroundings with a simulated environment, such as a construction site, a subway system, a coastal floodplain, or an energy grid.

**Augmented Reality (AR)**
Layers computer-generated imagery onto a user’s view of the real world, thus providing a composite view.

**Mixed Reality (MR)**
Blends augmented and virtual reality, allowing users to experience simulated content within their physical worlds and to manipulate and interact with virtual elements in real time.
Accessible Technology, Inclusion, and Business Value

People with disabilities can benefit greatly from XR tools. This makes it more important than ever for these tools to be accessible.

The rapid adoption of XR creates a unique opportunity for workplaces. They can now combine the use of immersive technologies with strong commitments to digital accessibility and workforce diversity. According to the Job Accommodation Network (JAN), employers whose Diversity, Equity, and Inclusion (DEI) policies include hiring people with disabilities often have a competitive edge.

Indeed, hiring people with disabilities and effectively supporting employees who develop disabilities contribute to a diverse workplace and improve an organization's bottom line. Organizations that hire individuals with disabilities earn 28 percent higher revenues, two times the net income, and 30 percent higher economic profit margins than their peers, according to a 2018 study by Accenture.

Closing the Skills Gap by Hiring People with Disabilities

As hiring began to tick up in early 2021, some employers expressed their frustration at the lack of qualified applicants in their search to fill jobs. Even before the pandemic in early 2020, 74 percent of hiring managers surveyed by the U.S. Chamber of Commerce Foundation said they believe there is a skills gap in the U.S.

Employers indicated they find it hard to identify candidates with the necessary skills to fill job openings. These skill-based positions could be filled by experienced and knowledgeable people with disabilities. In fact, the U.S. Chamber of Commerce Foundation has proposed that many organizations begin to look at so-called “opportunity populations” as a promising way to find talent. The phrase “opportunity populations” refers to people who face disproportionate barriers to employment, including people with disabilities.

However, no DEI program will be successful without accessible technology. Employers who want to enhance training and operations with immersive technologies should ensure the products they use are accessible. These technologies must be optimized for all employees, with and without disabilities. That means investing in XR technologies that:

■ are flexible,
■ support different input modalities, and
■ allow users to interact in different ways.

For example, a user should be able to change the background color or add voice augmentation when using a tool.
Section 2: Implement Inclusive XR

Organizations can leverage existing accessibility knowledge to make sure XR tools work for everyone. Ways to get involved include taking advantage of industry resources, engaging with community initiatives, and practicing inclusive hiring. They can also tap into the inclusive design and workforce DEI programs that already exist in their organizations.

Additionally, it is important for organizations to build a business case for inclusive XR. A business case provides context and demonstrates how inclusive XR will help them achieve their business goals and work toward recovering into inclusion.

Get Involved in Community Initiatives

XR hardware, software, and content developers all recognize that employers need to provide accessible immersive technologies for workers with disabilities. They work with disability advocacy groups through the XR Access Initiative to advance the accessibility of XR platforms, applications, and content. XR Access work streams create new accessibility resources for XR, ranging from accessible development tools to the business case for XR.

Teach Access works to equip students in higher education with the knowledge they need to design, develop, and build new technologies with the needs of people with disabilities in mind. Initiatives like Teach Access can help ensure that the next generation of researchers, designers, and developers of immersive technologies understand how to make those technologies accessible from the beginning, rather than relying on plug-ins or other separate accessibility technologies.

Build a Business Case for Inclusive XR

A solid, comprehensive business case is an essential tool to ensure that immersive technologies are accessible. It can help to justify an organization's accessibility initiative. It can also help organizations to communicate about their initiative to internal and external stakeholders.

Employers should develop a business case for inclusive XR and immersive technologies that does the following:

- Maps to established organizational goals and objectives.
- Identifies how improving the accessibility of their immersive technology infrastructure can advance their business.

The XR Association offers a variety of public policy perspectives, as well as research and best practices, that can help inform an organization's business case.

Because XR technologies are always evolving, the business case should be considered a living document. Organizations should review and update their business case regularly to reflect changes to systems and processes.

If an organization already follows a specific process for developing a business case, it should use internal resources to get started. For example, some organizations incorporate business case development into management training or maintain an intranet resource on the subject for individual employees or teams to access.

Guidance on Business Case (PEAT)
However, developing a new business case is not difficult. It basically entails laying out facts and logic. Some of the factors in a business case may need to be quantified. Others may only require a sound argument and concrete examples. Below are some guidelines to follow.

- Include an assessment of anticipated benefits and risks. For example, consider the use of the technology by diverse employees.
- Ensure that the business case research team includes three to five people with diverse lived experiences, including people with disabilities.
- Leverage consultants where needed to fill any gaps in the team's composition.
- Present the drafted business case to leadership to gain buy-in.

Leverage Emerging XR Accessibility Guidance

Organizations can benefit from seeking out emerging XR accessibility guidance. They should look for guidance that includes input from disability advocacy groups, researchers, inclusive design and accessibility consultants, XR platform manufacturers and software developers, and content developers.

One resource is the XR Association (XRA) Developers Guide, Chapter Three: Accessibility & Inclusive Design in Immersive Experiences. This chapter includes suggestions for how to ensure XR technology is usable and useful for everyone.

The World Wide Web Consortium (W3C), which publishes standards for the internet, has also created draft XR Accessibility User Requirements. These requirements help developers understand what people with disabilities may need when they access immersive applications and content. Other requirements from the W3C, such as the Real-Time Communications (RTC) Accessibility User Requirements or Immersive Captions Requirements, may apply to immersive technology-based applications or content an organization implements.

Finally, XR platform manufacturers like Magic Leap, Microsoft, and Oculus from Facebook have also started to offer developer guidance and resources.

Below is a sampling of best practices drawn from the XRA Developers Guide as well as other sources.
Inclusive Design for All Employees
- Provide the ability to remove or reduce background details and audio from virtual environments.
- Provide an undo or redo function and/or a confirmation of action so that users can correct or avoid mistakes caused by imprecise choices.
- Allow users to reduce the speed of the program or increase the time allotted for making decisions.

Inclusive Design for Employees Who Are Blind or Visually Impaired
- Provide Text-to-Speech (TTS) for visually impaired employees.
- Offer audio-based interfaces as an alternative to visual interfaces.
- Allow users to magnify or reduce objects and text to make them easier to see.
- Allow users to change the foreground or background colors of text.
- Allow users to change the brightness levels in the app.
- Provide shapes or symbols alongside meaningful colors, or provide textures on objects to help colorblind employees distinguish information in-app.

Inclusive Design for Employees Who Are Deaf or Hard of Hearing
- Provide captions or subtitles for live or recorded spoken audio features.
- Use icons or other indicators to identify the direction from which verbal and non-verbal audio features emanate.
- Display sign language interpretation of audio elements.
- Allow users who have hearing loss in one ear to switch from stereo to mono audio in cases where headphones are used.

Inclusive Design for Employees with Mobility Disabilities
- Allow the program to assist the employees in completing any task.
- Allow the use of alternate or separate controllers or sensors.
- Allow employees to use the program from a seated, reclining, or stationary position if the program otherwise would have the user in a standing position or using body movements to access the content.
- Allow users to remap controls on a standard controller or remap controls onto alternate controllers, sensors, or keyboards.

Inclusive Design for Neurodivergent Employees
- Allow users to adapt content displays, opt for subtitling or audio commands, turn off background audio, and/or highlight important information in apps.
- Provide the opportunity for users to experiment with the program’s interface and controls before undertaking any potential challenges or training tests in the program.
- Offer plain language tutorials on essential functions, with scaffolding for users to build from simple to complex maneuvers.
Practice Inclusive Hiring

Organizations seeking to address the skills gap are turning to new, more diverse talent pools, including people with disabilities. Doing so helps to foster a broad culture of accessibility and inclusion – which will also inform efforts to invest in accessible immersive technologies.

Organizations working to connect with new, diverse talent must implement intentional policies to look for and hire people with disabilities. Some helpful sources include:

- The Partnership on Inclusive Apprenticeship (PIA) collaborates with employers and apprenticeship intermediaries to design inclusive apprenticeship programs that meet employer talent needs and enable people with disabilities to gain credentials and skills to succeed in high-growth, high-demand industries.
- The Partnership on Employment and Accessible Technology (PEAT) also has resources to help employers recruit and hire people with disabilities. For example, PEAT’s TalentWorks: Accessible eRecruiting for Employers has helpful information on how businesses can make their online recruitment efforts accessible.
- The Department of Labor’s RETAIN Initiative (short for “Retaining Employment and Talent After Injury/Illness Network”) promotes “closer coordination among individuals and organizations who influence workers’ decisions about how or whether to stay at or return to work after a work disability.” The RETAIN Initiative also develops early intervention strategies to keep people in jobs after they experience a disability while employed.
- Source America helps to match people with disabilities with job opportunities and provides them with job search resources. This is another helpful resource for both job seekers and employers.

Engage Employee Resource Groups

Employee resource groups (ERGs) can help determine the accessibility needs of employees who will use the XR technologies an organization adopts.

An employers’ greatest resource may be its own employees with disabilities. This talent pool should be tapped to assess the immersive platforms and applications that an organization might use. Organizations should engage employees with disabilities to help plan and design any immersive content or applications built in-house.

These employees should also help plan the implementation of new technologies, including employee support and accommodations. To achieve this, organizations should refer to guidance from the Employee Assistance and Resource Network (EARN) on Developing Disability Employee Resource Groups and from PEAT on Planning Accessible ERG Events.

Talk to Suppliers and Involve Procurement Teams

Employers and their purchasing staff should build accessibility and usability into their information and communication technology (ICT) procurement processes. Perhaps the most crucial step is to prioritize accessibility when talking to vendors who supply immersive technology platforms, apps, or content they are purchasing or licensing. PEAT’s Buy IT! Toolkit can help an organization ensure that the ICT they buy and implement works for everyone—including employees, job seekers, and customers with disabilities.
Recover into Inclusion

The COVID-19 pandemic dramatically changed the way employers and employees view work and workplaces. Some of these changes could be good news for people with disabilities. This group often faces unfair barriers to occupations for which they are qualified. In many cases, remote work, flexible working environments, and increased adoption of new technologies such as XR can break down those barriers.

The U.S. Bureau of Labor Statistics (BLS) found that “almost half of all persons with a disability who were not working reported some type of barrier to employment.” Lack of education or training, lack of transportation, and the need for special accommodations at the job were among the barriers reported to BLS.

Accessible XR holds the promise of removing some of the obstacles that people with disabilities face in joining the job market. It may also help employers commit to making their labor force more diverse and inclusive. Inclusive and immersive technologies should be a part of every employer's post-pandemic strategy to find new skilled workers, increase the diversity of their workforce, and become a part of a recovery powered by inclusion.

Section 3: Inclusive XR and Job Training

Immersive job training programs have seen a rapid increase in popularity in recent years. Forecasters at ABI Research predict that by 2025, close to 60 million people will be using augmented reality training applications. ABI notes the industries that are likely to see the most XR training adoption include “healthcare, logistics, architecture/engineering/construction (AEC), and manufacturing.” Given the wide range of industries using XR for job training, it can be helpful to delve deeper into just how these technologies are used and why they are beneficial.

Benefits of Inclusive Training in Workplaces

XR technologies can help employees train for their jobs, learn new skills, and perform their daily work. Below are specific examples of how beneficial XR technologies can be for organizations and employees.

Job Training

Popular training methods include simulations and on-site augmented or mixed reality applications. Training employees with XR provides many benefits, including:

■ Employees can practice dangerous or difficult tasks in a safe environment.
■ Employees can learn new professional skills.
■ Employees can train or upskill in a shorter time frame.
■ Employees can train with limited work interruptions.
■ Organizations can free up staff who would otherwise be training employees.

Knowledge Capture

Immersive job training programs are often built in part to conduct knowledge capture. Knowledge capture helps ensure that expertise is not lost even if an experienced employee leaves or retires. Through knowledge capture, new employees can easily learn from past employees or employees too busy to conduct trainings. New employees can train using augmented or virtual reality and better understand the skill or process they are learning. For example, recent hires can access recorded equipment repair demonstrations prepared by an expert.
Knowledge capture programs must be accessible. When they are not, employees with disabilities will not be able to access critical information. They also will not be able to share their own knowledge with others. By giving experienced employees an accessible way to **author or create the immersive training programs themselves**, expertise and experience stay with the company even after they depart.

**Information Retention**

Employees benefit greatly from immersive training programs. A [2018 University of Maryland study](https://www.um.edu/movies/vr-training.html) showed that virtual reality training can help people better retain the information they are learning. Additionally, a [2020 PwC study](https://www.pwc.com/gx/en/services/software-development/immersive-training.html) revealed that those using virtual training were four times more focused than their peers and 275 percent more confident in applying what they had learned.

**Job Site Familiarity**

XR can help employees learn about job sites. Employees who are neurodivergent, for example, may benefit from what are sometimes called “explore world” XR scenarios. These scenarios allow users to familiarize themselves with a workspace before starting a job. Trainees can interact with and explore the environment using XR before going in person. They can also learn the tasks they will be asked to complete and in which order. For example, employees can use XR to virtually explore a construction site or learn how to repair complex machinery with augmented reality.

**Enhanced Accessibility and Inclusion**

XR and immersive technologies can enable employees with disabilities to participate in the workplace in new ways. When made accessible, these technologies give employees with disabilities key resources that may enhance or surpass accommodations they currently use. They often introduce new ways of working, particularly to employees without disabilities or those with temporary disabilities who have not tried assistive technologies previously, such as an employee with a broken hand.

**Customized Interaction**

Immersive technologies offer employees different ways to access platforms, applications, and content. Users can choose different ways to interact, such as using controllers, keyboards, voice, eye gaze, and gestures. XR can also support multiple ways of receiving information, such as through sight, sound, and touch. Giving employees different ways to customize their interactions can increase accessibility and help ensure broad usability.

**Remote Assist and Collaboration**

Immersive technologies can enable all employees, including those who have disabilities, to collaborate and receive assistance from co-workers. For example, a less experienced technician might connect with an expert employee who has a disability to troubleshoot on-site machinery issues. XR can virtually overlay digital information into physical job settings and help employees trade information without being in the same location. This facilitates intergenerational and expert knowledge sharing.
Immersive Job Training in Practice: Wind Turbine Technicians

The fastest-growing job in the United States is wind turbine technician. The rapid growth of this job is largely due to the expanding wind energy sector. BLS projects this job will grow nearly 61 percent from 2019-2029. Wind turbine technicians may need to “inspect, diagnose, adjust, or repair wind turbines” and “perform maintenance on wind turbine equipment including resolving electrical, mechanical, and hydraulic malfunctions,” according to the Occupational Information Network (O*NET).

Wind energy organizations already use immersive technologies to train and upskill their workers. They use immersive technologies to simulate work environments both at control centers and inside the turbines themselves. For example, a worker may use a virtual reality headset to walk through the steps needed to safely shut down a turbine and prepare it for maintenance or repairs. This eliminates the need to perform the task for the first time in a potentially dangerous setting.

These training technologies can also assist people with disabilities to get accustomed to work settings, prepare for a job, and identify additional accommodations they may need.

XR technologies can also provide live, remote assistance to workers on the ground. A worker encountering a problem can use XR technologies to access expertise from more experienced technicians. A technician would not need to leave a malfunctioning turbine or make a phone call to find another employee with more expertise. Instead, the technician could use augmented or mixed reality applications to connect to an expert remotely. The expert could view the same scene as the on-site worker via live video communications with remote assistance.

The Promise of Remote Assist for People with Disabilities

- Employees can communicate and collaborate in areas like troubleshooting on-site machinery issues.
- Each employee can translate between languages (including sign language using video) and modes of interaction (voice, text, gestures).
- Highly skilled employees can collaborate seamlessly without needing to be in the same physical place. For example, a novice technician could connect with an experienced manager who has a disability.
Section 4: Spotlight on Inclusive XR in Manufacturing

Product manufacturers have embraced immersive technologies for many years. Manufacturers continue to find new ways to use XR, from engineers who use virtual reality to design cars to technicians who use augmented reality on the airplane factory floor.

Benefits of XR in Manufacturing

Manufacturers already use XR for inventory and warehousing, machine repairs and inspection, engineering tasks, and component assembly. XR brings many benefits for manufacturers and their employees.

By using XR, manufacturers can:

- Reduce danger and harm.
- Demonstrate various scenarios.
- Avoid interruptions to working operations.

The promise of immersive technologies in manufacturing prompted the National Science Foundation in 2020 to partner with Purdue University to build “platform-agnostic” augmented and virtual reality programs for use in factories. Platform-agnostic means the technology can be used on any digital device, regardless of who built it. This effort can allow organizations without the technical ability to build their own augmented or virtual reality to generate workable immersive tools for their specific needs. The program is already piloting with manufacturing facilities in Indiana.

Addressing the Worker Shortage in High-Growth Manufacturing Jobs

As a result of COVID-19, the job market has seen an increase in demand for skilled employees in manufacturing. Manufacturing organizations report that they cannot find qualified applicants for technical jobs that do not necessarily require a college degree. According to a recent study from Deloitte, U.S. manufacturers estimate they will have nearly 2.1 million unfilled jobs by 2030 because of a need for skilled workers.

Many of those jobs could be filled by people with disabilities. After all, more than 9 percent of people with disabilities who are employed already work in manufacturing jobs, according to BLS. The Kessler Foundation in 2020 announced a grant program to encourage manufacturers in New England to hire people with disabilities at entry-level positions that offer “opportunities for career growth and economic sustainability.”

Immersive Applications in Manufacturing Require New Skills

The most in-demand jobs in manufacturing are machine tool programmers and operators or industrial mechanics. BLS estimates a 3 percent growth rate in these kinds of jobs over the next ten years.

There are a variety of augmented and virtual reality applications currently on the market to assist in all facets of the manufacturing process. For example, many factories use what are known as computer numerically controlled (CNC) machines, which machine tool programmers configure to ensure the product specifications are correct. Some XR programs simulate the tooling process to help the programmers ensure precision in the manufactured product.
Similarly, some manufacturers provide machinists and mechanics with immersive technologies to help troubleshoot production issues and diagnose repairs. One example is a mechanic who relies on augmented or mixed reality glasses while looking at a factory machine. The glasses overlay instructions and graphics to show how to operate the machine or how to make a needed repair. In recent years, aircraft manufacturers have started to use mixed reality glasses to assist their factory workers with completing complex wiring assembly on airplanes.

**Inclusive XR Will Benefit Manufacturing**

**Immersive technologies can assist employees with or without disabilities. They can help them to visualize or remember the steps needed to complete complicated tasks and maintenance on the factory floor or in control rooms.**

Inclusive XR can help all employees overcome situational limitations they experience while working. For example, factory floors can sometimes be loud environments. Using text or other visual descriptions of instructions in a factory can help all employees as well as assist employees who are deaf or hard of hearing.

In a similar vein, employees in assembly-line jobs often wear uniforms and accessories such as gloves. It is critical to offer these employees multiple ways to interact with immersive apps, such as using voice, eye gaze, or gestures.

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**Section 5: Spotlight on Inclusive XR in Healthcare**

Both healthcare business leaders and XR technology leaders see healthcare as one of the top markets for virtual and augmented reality programs. From patient-centered applications like planning surgeries with virtual reality to nursing school curricula, the healthcare industry has explored how XR programs can augment health outcomes for patients for many years.

**Benefits of XR in Healthcare**

Patient-centered approaches appear to drive much of the growth in immersive healthcare technology today. ABI Research forecasts that the augmented reality healthcare market is expected to generate as much as $10 billion in revenues by 2024, while virtual reality applications could generate up to $1.2 billion during the same period.

ABI also notes that provider-focused applications such as education and training are an important part of that growth. “AR and VR solutions have proven their value and are increasingly established in healthcare training and education, pre-operation and treatment planning, and data/3D model visualization use cases,” ABI noted in its October 2020 report on XR in the healthcare industry.

In line with this trend, the University of Kansas announced in 2020 that it was working with a major cell phone carrier on virtual and augmented reality training for nurses. The training will explore “new and creative ways to educate and train nurses across a variety of settings – whether they are attending a university, conducting research in a lab or working in a rural clinic or large metropolitan hospital.”
Similarly, administrators turned to augmented reality after the COVID-19 pandemic initially shut down the University of Michigan School of Nursing. They used augmented reality to continue teaching students a variety of critical patient procedures. Students learned techniques such as how to insert catheters, start an IV, and insert a chest tube. Using a mixed reality headset, students could practice procedures on manikins. The immersive technology allowed them to view instructions and videos safely as they performed the procedures in a sterile and socially distant environment.

**Addressing Worker Shortages in High-Growth Healthcare Jobs**

Jobs in healthcare are growing exponentially. Demand for positions such as nurse practitioners, occupational therapy assistants, and physician assistants are among the fastest-growing jobs in the U.S., according to BLS. BLS projects the growth rate for nurse practitioner jobs will be more than 52 percent from 2019 to 2029.

The healthcare industry already employs a fair number of people with disabilities. BLS estimates that of the people with disabilities who have a job, more than 21 percent are in healthcare and education jobs. However, nurses with mobility disabilities have had challenges getting hired. These hiring practices have been proven wrong time and again, as Forbes detailed in July 2020 when it featured the stories of three nurses with disabilities who were working to combat the COVID-19 pandemic in hospitals around the country.

Organizations such as the Association of Medical Professionals with Hearing Losses (AMPHL) offer mentorship programs for people who are deaf or hard of hearing who are looking for jobs in the medical field. Similarly, some healthcare providers have piloted programs aimed at recruiting people with disabilities into the medical field. For example, Cincinnati Children’s Hospital’s Project Search aims to train and educate teenagers with disabilities so they can enter healthcare jobs.

**Immersive Applications in Healthcare Require New Skills**

Many believe that XR learning applications for doctors and nurses are revolutionizing the field of medicine. This is because they allow medical professionals to make mistakes and learn from them without harming actual patients. Instead of practicing on actual patients, medical professionals can engage in virtual simulations that help to develop their clinical decision-making, empathy, knowledge of medical conditions, and understanding of human anatomy. In nursing education, students studying to be nurses or nurse practitioners can use immersive technologies to practice diagnosing virtual patients who have unique personalities and characteristics. They can attend to virtual patients in various clinical settings and receive detailed feedback on the outcomes of their treatments.
Many immersive applications explore how to advance telehealth. In telehealth settings, doctors and nurses see patients virtually and examine lab results and x-rays from afar. Innovations like these are seen as especially needed in rural areas. Access to healthcare professionals and advanced medical treatments may be scarce in these areas. These technologies also create the potential for people with disabilities to provide care and give treatment advice remotely if they are unable to be in a clinical setting. Additionally, accessible immersive technologies may also be beneficial to patients seeking care for temporary or permanent disabilities. These patients may need to access accessible XR technologies as part of their care.

**Immersive medical simulation training could help remove some physical barriers to nursing training.** This approach could allow nursing students to practice in accessible virtual environments. Nursing educators Stacey M. Carroll and Carrie Eaton have suggested two strategies in *The Journal of Nursing Education* to address physical barriers that may be present. They proposed “peer assistance and delegation — both of which are done by nurses without disabilities as well” as a viable option. This type of accommodation can work for a nurse with a disability or a nurse with a temporary or situational disability.

Carroll and Eaton also note that medical simulation training can provide more accessibility than some clinical sites. Clinical sites may be located in older facilities and have small rooms that are not wheelchair accessible. Though Carroll and Eaton do not directly address immersive technologies, it is not a leap to imagine that when using XR technology, a more experienced nurse could virtually support a student or a colleague using augmented or virtual reality remote assistance programs.

**Inclusive Design of XR Will Benefit Healthcare**

The use of immersive technologies in healthcare settings can help employees with or without disabilities. They can use it to visualize or remember the steps needed to complete procedures and diagnostics, as well as communicate and collaborate with their co-workers and patients. Also, in medical settings, both practitioners and patients could experience temporary physical, sensory, or cognitive challenges due to a medical condition, wearing medical uniforms, following safety procedures, or staying focused on performing tasks. Every medical professional will benefit from the ability to choose how they interact with an immersive application.

**Learn More**

To learn more about inclusive XR in the workplace, please visit [PEATWorks.org](http://PEATWorks.org) and [XRA.org](http://XRA.org).