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## The Importance of Including Interactive Immersive Technology in Instructional Design to Enhance Learner and User Experience

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# The Importance of Including Interactive Immersive Technology in Instructional Design to Enhance Learner and User Experience

By Shawnedra Crout

An Alternate Plan Paper Submitted in Partial Fulfillment of the Requirements for the Degree of  
Masters of Arts  
In  
English  
Technical Communication

Minnesota State University, Mankato  
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# Abstract

Americans looking for work and preparing to enter the labor force use technology during every part of the journey. Every generation in the labor force and preparing to enter the labor force as freelancers, contractors, and employees need clear, effective support materials to learn how to do their job, stay abreast of the ever-changing job requirements, and deliver a satisfactory job performance. Solving the labor shortage in America will take a concerted effort from those in the private sector. Technical communicators tasked with the responsibility of designing instructional resources should know how to include interactive immersive technology in product use and training materials to enhance learner and user experience. Employers and clients must provide administrative and financial support in order for technical communicators to include these technologies.

# Introduction

Murmurs have begun on social media sites and news outlets about an unsavory problem plaguing the American workforce. Articles are being written about the median age in America for the summer of 2019 being 38. (Tanzi,2019) LinkedIn hoped to entice readers to click the bait by calling it 'America is Greying: Half US over 38'. Directly beneath that link 'Job Seekers Confront Ageism' waited to be clicked.(Allen, 2019)

Observations and patterns of age discrimination during hiring and firing practices for organizations of every size were chronicled on the East and West coast. (Conley, 2018) Unwillingness to hire aging talent is not a new or menial problem for corporate America. As important for the current talent pool, future talent, and the fragile national and global economy is how to embrace the aging workforce and institute more humane hiring practices. Corporations need to reinstate the valuable proven strategy of investing in talent development and on the job training.

Economists and labor forecasters predict the gig economy or freelancing will soon make up half of the workforce.(Bayern, 2018) Displaced employees from the industries in decline, as well as traditional employees launching passion projects and freelancing outside of their place of employment, will be part of this new subset of workers making up the gig economy. Many of these gig workers who are already in the workforce are accessing new software and teaching themselves new skills. Employees and freelancers are using products where instructional content using augmented reality or mixed reality may provide a better experience. Product or skills where hands on guided instruction is proven to provide better understanding but a teacher or instructor is

not available for live support, augmented or mixed reality offers a computer generated alternative that works better than images or video.

The rise in discrimination due to ageism indicates that the lack of willingness to hire trainable and willing workers in new technologies with transferable skills from declining industries may become a costly vulnerability in an already slowing national and global economy. As renewable energy, robotics, and automated manufacturing processes that require advanced technical skills increase, talent with transferable skills from declining industries provide a promising opportunity. (Ivanova, 2019) Responsible and inclusive corporations willing to invest in the health of the economy by investing in training programs for older and experienced laborers will need technical communicators able to produce instructional material effective for several generations.

The current labor force includes Baby Boomers (1946-1964), Generation X (1965-1979), GenXennials (1975-1985), Millennials(1980-1994), Generation Z, and Generation Alpha. (Robinson, n.d.) Due to the anxiety from the 2008 recession older workers are opting to remain employed longer. (O'Brien, 2018) employees range from individuals who were alive before television was invented to individuals who don't know a world without broadband internet and mobile devices. This erasure of the Kantian use of schema in most training environments can be resolved by implementing experiential and immersive learning environments for companies who provide services to and employ workers based on skill versus age.

Technical communicators responsible for instructional design able to include interactive immersive technology like augmented reality and virtual reality will enhance the learner and customer experience. Using tools and creating an environment that will

provide the best opportunity for a learner or customer to achieve a goal shapes every decision when designing instructional content. Whether being used for employee training or an instructional resource for a product immersive technology adds a level of engagement that provides deeper stimulation for the learner and customer.

## Definition of Terms

Augmented Reality (AR) - an enhanced image or environment as viewed on a screen or other display, produced by overlaying computer-generated images, sounds, or other data on a real-world environment. (dictionary.com)

Diegetics - music in a film or movie or virtual world that can be heard by the characters in the film, movie, or virtual world.

Experiential - relating to, derived from, or providing experience.

Haptic - nonverbal communication that relies on touch and/or movement

Kantian use of schema - an expectation for a person to have an understood concept or knowledge of something in a certain category due to previous exposure based on the philosophy of Immanuel Kant

Software as a Service (SaaS) - a software application used by consumers or companies based on a paid annual or monthly subscription that is hosted by a 3rd party company in a cloud infrastructure that the customer is unable to access. (Kavis,2014)

Sprite - a two dimensional graphic object used in AR

Vector image - a two dimensional illustration made of continuous paths, lines, and curves

Virtual Reality (VR) - the 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/goggles with a screen inside or gloves fitted with sensors.

## What is Immersive Interactive Visual Technology

Immersive interactive visual technology is the technology that blends digitally rendered images and shapes with the physical world of the learner or customer.

Augmented Reality experiences may consist of vector graphics, icons, illustrations, and sprites as well as 3D images of actual objects created using specialty software created programs developed for the sole purpose of creating immersive technology.

Virtual Reality technologies completely immerse a user inside a synthetic environment and while immersed, the user cannot see the real world around him. In contrast, Augmented Reality is taking digital or computer generated information, whether it be images, audio, video, and touch or haptic sensations and overlaying them over in a real-time environment. (Kipper, Greg, and Rampolla, 2012)

Creating a video of yourself with a SnapChat sticker can be considered an example of augmented reality. Another example of augmented reality is the popular Pokemon Go mobile game. (Clark, 2019)

Augmented Reality



Acceptance and use of immersive technology in weather reporting by the weather channel made headlines in late 2018. (Schroeder, 2018) Older and younger viewers were impressed by the use of mixed reality (a type of augmented reality) to depict the impact of floods in September. (Holley, 2018) YouTube reactions and headlines praising the realistic depiction of storms and tornadoes without the danger of being in the environment exposed viewers to augmented reality outside of entertainment use cases like SnapChat and Pokemon go. (Holley, 2018)

## Virtual Reality

Whereas augmented reality injects digital renderings into a person's environment, virtual reality becomes the person's environment. A new environment or reality is depicted using technology that makes the person feel as if they have left their true environment for the virtual world. In most entertainment uses of virtual reality, the content includes visual, diegetic, and haptic stimulation based on how the person responds to what is happening in the virtual world. There are also virtual reality experiences that engage the olfactory senses in the experience.

## Instructional Design for Technical Communicators

Technical communicators responsible for designing instructional materials for educational institutions, corporations, and clients are tasked with the responsibility of producing materials that enable the learner to meet a learning objective. Technical communicators in these types of academic settings, the faculty they serve, and students engaging with the materials would benefit from the inclusion of immersive technology in

course materials. This research focuses on the importance of the benefits of including immersive visual technology in instructional design for technical communicators working outside of academia based on my experience in the workforce over the last twenty-seven years, concern for the current labor market, and hope to be a part of the solution.

Technical communicators may be called tech writer, eLearning designer, PowerPoint Presenter, Talent Developer, Instructional Designer, Course Developer, as well as other titles based on the culture and environment of the company. No matter the title a shared responsibility for these technical communicators is to create content that meets the employer or client's expectations as well as delivers the content needed by the learner or user. As it pertains to training in most industries, course content takes the form of slide-based lecture-driven instruction by the designer or a corporate trainer, or may take the form of a handbook, instructional guide, knowledge base, or tutorials on a website. Today's technical communicators are responsible for the instructional design of training documentation for private corporations, how-to guides for physical and digital products, step-by-step tutorials for SaaS solutions, scripts for instructional videos, and organization of the content to be repurposed in other parts of the organization and other communication-related tasks based on the organization's need. Technical communicators are hired by service corporations and manufacturing firms for the purpose of creating course content that will be used for employee training.

Budget restraints for some small and midsize corporations force some employers to provide employee training on an 'as needed' basis using course content created without formal training in instructional design. Consultants, freelancers, startups, and gig economy participants in many cases are unable to afford the dedicated staff or hire

consultants able to create instructional design-based content for employees or clients who need assistance with using the products. With the growth in digital products, the need for technical communicators who are able to provide professional, well designed instructional content will continue to increase especially as it pertains to content that utilizes immersive visual technologies.

With the rapid advances in technology, a lower barrier of entry makes it easy to create VR/AR-based training and support solutions. Learners and employees may have access to company-provided VR or AR hardware. Customers may download a mobile application for product assembly. For example, augmented reality based how-to guides may replace the illustration based step-by-step instructions for assembling furniture. A store like IKEA could benefit from this approach using their current smartphone application for viewing how a piece of furniture would look in a specific space prior to purchase. Making this upgrade to the app would enable the customer from the beginning to the end of a customer's buying cycle, build trust in the company and increase the probability of future purchases from the brand. New updates to current (2019) smartphone operating systems have shown corporations that they have an opportunity to begin to realize the long term cost-effective advantage of using AR/VR training and development for current and new employees, as well as clients.

Technical writers' areas of expertise have expanded from an ability to write clear effective content about complex topics or devices to communicating those complex topics using text, illustrations, audio recordings, and video. Immersive technologies introduce a new content medium with the ability and potential to assist technical

communicators in creating content better able to improve performance and retention.  
(Armfield, Duin, Pedersen, 2019)

The foundational premise for the use of virtual and augmented reality is to use the most relevant resources available to provide solutions that will ultimately assist the learner or customer in achieving their goal. For corporate entities, using immersive technology to create content is tied directly to revenue. For employee training instructional material is provided to assist the learner in improving their job performance. For customer support instructional content is provided to remove obstacles and provide the information needed to assist the customer in accomplishing their original goal for choosing the product.

## Benefits of Immersive Technology in Corporate Instructional Design

### Society at Large

With more older adults working longer or choosing not to retire providing in house training for new employees using immersive technology is an option corporations may want to explore as an alternative to paying for travel, lodging, and meals. For workers with transferable skills providing in house training may be the resolution evading companies reporting a “labor shortage.” (Cox, 2018)

“Some employers continue to provide a great deal of training, but the evidence suggests that, on average, most employers do not, largely to save money. When asked in a Business Roundtable survey why they did not train,

employers responded overwhelmingly (76 percent) that costs were the reason. Furthermore, nearly a fifth of those employers indicated that they didn't want to risk investing in employees who might leave the company soon thereafter.” (Capelli, 2012)

The sentiment observed by Capelli for providing internal or initial employee training has not improved since 2012. Based on the research by Tanzi (2019), Allen (2019), and Conley (2019), with the growing effects of ageism as it pertains to hiring practices the problem may be worsening. Mature workers provide a diverse insight into product use by the older generation, work experience, and creativity. (Farrel, 2019)

As the median age for workers in America continues to climb proactive businesses will need to embrace an older workforce. Technical communicators contracted to produce training materials or hired to work for inclusive companies with the ability to incorporate immersive technology will provide experiential learning. Traditional tacit learning experiences for global companies is cumbersome and expensive.

An unexplored benefit of immersion learning is the ability to provide an opportunity to build skills that employees have developed as part of the company culture or on the job experience. For example, a firm where using your intuition is encouraged is easier to understand in a VR training. Reading about it or watching a video testimonial may convey the sentiment or result but doesn't provide the same insight possible in a VR training experience.

Immersive learning using AR/VR removes the need to bring everyone together to have the same experience when using the same training content is the right solution. In

industries where local technicians' or practitioners' environments are not the same as the headquarters' environment, there may be nonmonetary, safety, and performance benefits to using immersive learning. This use of immersive training may reduce the need for the technician to "guesstimate" the correct unexamined procedures or adaptations, trial and error ratio, and minimize inefficiencies due to receiving accurate training based on the parameters of the job site and having been immersed in situations that required the technician to think through and solve issues that will arise in the field.

Society at large can benefit when a company hires and invests in users, workers, and learners looking to transition from industries and jobs that are in decline who have transferable skills. Automation, business life cycles, and new technology have eliminated positions for employees who still want or need to work, but who are uninterested or unable to incur the debt associated with formal education. Improving the training received for jobs with related skills by using immersive technology will help these workers transition into new roles.

## Employees

In Capelli's research (2012), business executives disclosed money as the reason for ending in-house training programs. They cited the fear of losing employees they train to competitors as the reason for not training them. Despite the cost incurred trying to replace lost talent or loss of profits due to prolonged vacancies, many companies continue to ignore or discount the impact of not investing in talent or company culture. This shortsighted behavior also ignores the impact of company culture on the profit margin.

Intrinsic benefits of providing training using immersive technology can increase the bottom line. (Prossack, 2019) Another benefit is the possibility it will improve company culture by showing employees you value them. Investing in providing effective training can improve employer-employee relations by creating an effective learning environment. Offering experiential training using immersive technology can communicate your confidence in the employee's contribution to the product and company. (Kermally, 2004)

Employees who feel valued will have better job performance, and improved job performance has a positive impact on the bottom line. (Kermally, 2004) While providing an effective learning environment doesn't guarantee a specific profit margin, it does increase the probability of improved job performance.(Kermally, 2004) Providing an effective experiential training environment may increase employee retention. Valued employees are less likely to leave an organization. (Branham, 2004) Experiential training provides more effective training which can improve employee efficacy. (Dirksen, 2016)

Feeling devalued and underappreciated is one of the top reason's employees leave organizations according to Leigh Branham. Branham explains it this way in her book, 7 Hidden Reasons Employees Leave; (Branham, 2004)

“After all, the comments of lost employees reveal that in all too many cases, disengagement really is about management 's failure to consider the impact of their actions, or lack of action, on employees ' emotions, especially when it results in an employee feeling worthless.”

Supporting the technical communicator's use of immersive technology can communicate that an organization holds a positive valuation of current and future employees, including the contributions of the technical communicator.

#### For Clients

Clients are small businesses, entrepreneurs, and startups who recognize the need to contract with a technical communicator for a special project without hiring them as a full time employee. The cost of creating immersive technology has decreased considerably since the introduction of the technology in the nineties. Due to the widespread personal use of devices with the hardware capabilities needed including virtual reality and augmented reality use has become a viable option for small businesses. With a lower barrier of entry startups, small businesses, and midsize businesses may be able to capitalize on including augmented reality or virtual reality as part of the instructional design for new product training and product documentation.

In a training environment including immersive technology in an experiential learning environment can lead to an improved attitude toward 'on the job training'. Fletcher shares how motivation and attitude toward training has a direct impact on retention, new process adaptation, and job performance. (Fletcher,L., Alfes,K., Robinson, D., 2018) For learners in a startup or small business partnering with a technical communicator using immersive technology can reduce the time from concept to execution providing a timely training solution, similar to the experiences created by Pixvana, in iterative and agile company cultures. (Schlosser, 2019) Vice President of corporate strategy for Pixvana, Tamara Turner, shared several use cases for the three



year old startup that included training for luxury cruise lines, Walmart, and athletic programs.

Clients who work with technical communicators who use immersive visual technology to create product support resources may see an increase in positive sentiment toward the brand due to successful product implementation. Successful product implementation can increase an organization's customer satisfaction rating and improve brand reputation. Improving brand reputation can lead to improved company-client relations. Providing a beneficial product that leads to strong company-client relationships due to a positive brand reputation can increase word of mouth referrals. An increase in word of mouth referrals can lead to more sales. (Lowenstein, 2011)

## Customers

Interacting with satisfied or happy employees may improve customer experience. (Prossack, 2019) Investing in training materials demonstrates a commitment to providing what is needed to succeed to clients and employees. Customer experience may also improve due to providing instructional materials that improve product implementation. Customers expect documentation, support materials, and resources that will make it as easy as possible to use a company's products.

## The Importance of Including Immersive Interactive Technology in Instructional Design

For the Technical Communicator

Designing instructional content for the product user or learner that provides a positive learning experience is one of the primary concerns for a technical communicator. Technical communicators who include virtual reality and augmented reality do so to improve the learner and user experience based on constructivist learning theory. Constructivist learning theory requires the instructor to explore how the learning models and technology support the learning experience using the “exploration and discovery of prebuilt artificial and real world.” (Huang, 2010)

Instructional design that includes immersive technology creates the best interactive learning environment possible because it is designed for how people learn and provides relevant instructional materials for retaining new skills. The ability to learn complex, technical and new procedures in a more engaging learning environment improves the probability of retention for execution. Improving learner retention for execution can lead to shorter training durations and better performance.

Most corporate training is measured by how well learners meet associated performance objectives and key performance indicators related to the training. Technical communicators choose learning management systems, instructional design tools, and presentation methods to meet the learner’s expectations. Interactive technology, such as virtual reality and augmented reality, provides a “hands-on” tool that gives learners constructs suited for information recall, developing critical thinking, and creating schema foundations in the virtual world which can be used for client interaction and problem-solving in the real world.

An example of successful use of virtual reality as a “hands-on” tool that improves the learner’s experience can be found in the dental industry. Roy, Bakr, and George’s

research on the need for virtual reality training in the dental industry focused on the lasting effect of learning in a virtual environment for understanding key concepts instead of rote memorization. The results of their research found that the students had a better learning experience and were able to execute what they learned in the virtual environment in real world application quicker. (Bakr, George, Roy, 2017)

Berlingieri, Lykoudis, and Wynn (2017) demonstrated the efficacy of implementing immersive technology in their study for the American Journal of Surgery. (Berlingieri, Lykoudis, Wynn, 2017) The research consisted of designing a “structured virtual reality (VR) laparoscopic sigmoid colectomy curriculum” to compensate for the lack of practical opportunities for students to perform the surgical procedure (p.611). A sample group of recognized experts in the field completed the simulated surgery module of the curriculum in the virtual reality environment before the entire curriculum was used for the instruction of fourteen surgical trainees. Findings from this study validated the positive impact of including virtual reality in adult interactive instruction and training.

Tzung-Jin Lin and his associates were able to find similar success when they investigated learners’ collaborative knowledge and behavior patterns in an augmented reality simulation system. Participants were given a pretest and post-test on elastic collision. One group of participants received standard two-dimensional simulation to learn about elastic collision. The other group learned with the assistance of a mobile collaborative augmented reality system. After engaging the same information and three category coding scheme the group that learned using the mobile collaborative augmented reality simulation system showed better learning achievements than the

participants who learned with the traditional two-dimensional simulation system. (Lin, T., Duh, H. B., Li, N., Wang, H., Tsai, C., 2013)

#### For the Learner

It is important for technical communicators to include immersive interactive technology in instructional design to improve product user and learner experience. Access to engaging learning materials provides a learning environment that enables better real-life application of the information obtained and better product implementation for users. Interactive technology provides the reference points needed to construct knowledge by learners that have been proven to improve retention and better real-life application of new concepts, procedures, and strategies. (Huang, 2010)

During their investigation of learners' attitudes toward virtual reality learning environments Hsiu-Mei Huang, Shu-Sheng Liaw, and Ulrich Rauch explored the results of using immersive technology as the natural evolution from including animation and multimedia to create "a more immersive, interactive, intuitive, and exciting" learning environment (p. 1171). (Huang, 2010) They make the case for this as a foundational principle of constructivist learning theory based on the teachings of John Dewey. Huang, Liaw, Rauch, Dewey and myself believe that "Knowledge is based on active experience." (p. 1173) Their research findings indicated that technical communicators could create better opportunities for learners using virtual reality learning environments. They propose five learning strategies for instructional design in virtual reality learning environments. Virtual reality learning environments should be used for role-playing, cooperative and collaborative learning, creative learning, problem-based learning, and situated learning (p. 1173).

Huang, Liaw, and Ruach reasons for using virtual reality learning environments for problem-based learning were proven based on the results of the laparoscopic surgery study (Berlingieri, 2017) and findings from the use of VR in dental education. “A VRLE allows learners to observe the simulated situation, and then motivate learners to learn and solve problem adequately through the immersive and interactive environment.” (p. 1174) The immersive nature of the virtual reality learning environment creates an environment conducive to focus on understanding and solving the constructs of the problem while building their knowledge base. (Huang, 2010)

#### For the Employer

The forecasted labor shortage Capelli predicted in 2004 is being chronicled in today's media by Forbes (Campbell, 2019) , Vox (Cagle, 2019), CBS News (Ivanova 2019), and the same way it was covered in 2004 by IndustryWeek, (Verespej, 2004).

“Employee flight is certainly a reasonable fear, but it is one compounded by an environment in which every employer wants trained workers and no one wants to pay for their training. If companies know that their competitors are also trying to hire experienced workers who can “hit the ground running,” they don't want to pay to train someone who will soon work for another company. Of course, this across-the-board intransigence virtually guarantees that it will be increasingly hard for any company to find qualified applicants, which will make long-term vacancies more and more common.” (Capelli, 2004)

Organizations that continue to allow fear to impede investing in quality, effective employee training consistently ignore the subliminal message of devaluation that can be

perceived by employees. Providing for immersive interactive training can be an investment in talent development associated with job satisfaction. Talent development that improves job performance and communicates respect for employees is an intrinsic benefit to investing in virtual reality and augmented reality-based learning environments (Kermally, 2004).

A decrease in the quality of job performance from employees tasked with additional duties due to long term job openings can have a direct negative impact on company culture. “In short, a huge part of the so-called skills gap actually springs from the weak employer efforts to promote internal training for either current employees or future hires.” (Capelli, 2004) In contrast, supporting technical communicators responsible for internal and client-facing instructional content can improve company culture.

#### For the Client

The democratization of VR/AR for business to business product deployment has not happened despite the growth of smartphone and mobile device ownership. Small businesses who hire contract technical communicators to produce instructional content for clients have an opportunity to differentiate their brand reputation by providing augmented reality and mixed reality customer support options. Trusting the expertise of the technical communicator who advises the use of interactive visual technology for safety, efficacy, and better product implementation can lead to providing better service to your customers, more referrals, and an increase in sales. Choosing to work with the technical communicator capable of appropriate inclusion of augmented reality, mixed

reality, and virtual reality for your company's instructional design need can be the difference between establishing a solid brand reputation for meeting and exceeding customer expectations and offering average customer experience.

#### For the Customer

For public-facing documentation, how-to guidelines, and mobile applications that provide product support including immersive technology can improve product implementation. As mobile technology continues to advance hardware and software capabilities for augmented reality product documentation as part of SaaS customer support may provide a safer, effective alternative to two dimensional or audio enhanced product support solutions. Incorporating augmented reality or mixed reality instructional content using a smartphone and tablet-based devices can be a safer alternative for field service technicians, technical skill workers, and service providers who use voice technology to access content for support.

### Barriers in interactive technology in instructional design

In her book, *Digital literacy for technical communication : 21st century theory and practice*, Rachel Spilka addressed the changing landscape of the technical communication field. (Spilka, 2009) Using a combination of overarching research and personal experience she provides the framework for technical communicators to stay abreast of the breadth and depth of the field as its responsibilities, technology, and expectations for the skillset possessed by technical writers evolve. Spilka clearly and effectively communicates the need for technical writers to understand the definition of

digital literacy, adopt a practice of lifelong learning, and prepare for the shift from writing, editing, and illustrating documentation to include designing for specialized workgroups with advanced capabilities and training in a complex subject matter or field.

The democratization of immersive technology provides the next new phase of information design for technical communicators. This means technical communicators must embrace the need to continue to develop and learn emerging design principles for augmented and virtual reality, deeper understanding of user experience as it pertains to virtual environments, and how to apply proven learning theories to these new technologies in the way that benefits learners. (Armfield, 2019) For traditionally employed technical communicators this may require providing plausible use case scenarios and intrinsic benefits to secure executive buy-in to invest in additional training. Freelance technical communicators will be tasked with finding the time to stay abreast of these emerging principles while satisfying their workload and acquiring new contracts.

## Software

DITA-based standards and regulations aren't available for three-dimensional renderings in augmented reality or virtual reality. Countless software providers are available based on the intended device for the content. Technical communicators who are able to incorporate the fundamental laws of accessibility, empathy, and visual literacy must draw on their previous knowledge base and adapt their skillset to produce accurate three-dimensional images that are as effective as their prior ability to communicate using text, animation, and multimedia. (Armfield,2019) An abundance of



software companies offering similar and competing capabilities may make it hard to know which technology to choose for future instructional design.

## Hardware

With the commoditization of personal computers and devices for accessing the internet, many technical communication duties are able to be done from a basic PC. Hardware requirements for creating virtual reality and augmented reality assets may not be possible with older machines. The need for more advanced operating systems, graphic cards, processors, and memory components may present a financial cost some technical communicators are not willing or able to invest. Technical communicators early in their career or working outside of a traditional corporate setting may have a hard time justifying the four to five-figure investment in new equipment.

## Design Skills

Technical communication specialists unfamiliar with visual design and newer modalities may struggle to bridge the skills gap. Smaller companies looking to capitalize on being an early adopter unable or unwilling to risk investing in talent development may find the skills gap for their current technical communicators too much of a hindrance. Freelance technical communicators may not have been able to afford to invest in learning the new skills needed. The lack of skills or budget may be able to be overcome by assembling a design team. This team be assembled in a way that draws on the strengths of product designers, customer support, management, and technical communicators. Each team member must be committed to embracing the time and

effort that will be needed to bridge any skills gaps that exist to move forward with employing the benefits of immersive technology.

## Executive Support

Companies slower to adopt new technology without proven efficacy for a new methodology may not be willing to consider experimenting with virtual reality or augmented reality. Clients who serve a niche or smaller customer base who may recognize the benefit of implementation may not have the budget or confidence incorporating augmented reality or mixed reality will be welcomed by existing clients or potential clients. Executives unwilling or unable to support the use of augmented reality and virtual reality will impede the ability of technical communicators to provide an enhanced learner and customer experience.

## Conclusion

New tools for achieving and maintaining a competitive edge in a technologically advanced economy are created and launched at a rapid pace. While access to augmented reality and virtual reality seem novel this technology has been in use since the 1990s. As more affordable tools and recognizable use cases for virtual reality and augmented reality in educational, training, and product support becomes apparent technical communicators will be an important part of including this technology in instructional design to enhance learner and user experience.

Specialized medical educational use cases for experiential learning has been used in several different countries across multiple industries with positive results for

increased learner retention and engagement in virtual reality learning environments. Similar results have been found for including augmented reality and mixed reality in instructional design in multiple industries. Global entities, large corporations, small businesses and SaaS providers with the foresight to support technical communicators who include immersive visual technology in instructional design can benefit from monetary and intrinsic benefits of investing in talent development and providing product support to enhance learner and user experience.

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