Immersive Realities for Learning and Performance
“VR, AR, Mixed Reality & More in 2018”

An Updated Report from The MASIE Center
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“Boldly Go... Where the Learner Has Not Gone Before”

My good friend, actor George Takei, shared with me the excitement that the cast and crew felt when shooting Star Trek back in 1966. They were all excited by the possibility of a virtual and immersive reality. They imagined that they could scan a planet, a person, or an object and simulate, play with, or even destroy it (virtually) while being deeply immersed in the experience. And, they knew that someday this fiction would become reality.

Ever since, I have been tracking, using, experimenting with, and researching the ever-changing and emerging worlds of virtual reality, augmented reality, mixed reality, and other immersive reality technologies and software. They keep getting better, though they still aren’t totally “there” yet. The challenge is to bridge the gap between their promise and actual use in workplaces to drive learning and performance.

The good news is that in the past three years we have made major jumps forward. If you are in a high-risk role (e.g. flying an airplane or performing heart surgery), immersive reality is starting to become affordable and, I would assert, essential. The leaps forward in technology are amazing, with investments by major companies like Google, Microsoft, Facebook, Apple, and more.

About 14 months ago, I asked Bobby Carlton, a friend and colleague who is engaged in technology subjects, to write a report for our Learning CONSORTIUM about the state of virtual reality. We posted that report in open source and tens of thousands of learning colleagues downloaded it.

With many current changes in this field, we recently turned back to Bobby to write an updated report. We evolved its name to include “Immersive Realities” (vs. just VRLearn) as the field is moving in many directions, all engaging in more immersion and even the ability to “fail” toward success.

Ultimately, I think immersive reality will be part of our everyday environment, without the need to wear goggles or be hooked up to a high-level computer. We will use mobile devices, leverage smart speakers, interact with immersive chatbots, and more! It is a good time to look at the steps being taken towards this new reality.

Our annual conference, Learning 2018, will dive deeply into immersive reality and we invite you to be part of the experience there (Learning 2018 – November 4-7 – Orlando, Florida – Early Registration Discounts at http://www.learning2018.com).

Our thanks to Bobby Carlton and our extended family of learning contacts around the world for their help on this report.

Let us develop, adapt, and produce immersive realities that allow us to “Boldly Go... Where the Learner Has Not Gone Before”.

Yours in Learning,

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VRLearn Recap
In 2017, the Masie Center published a report titled “VRLearn” that explored how virtual reality (VR) and augmented reality (AR) were being used in the L&D landscape in various industries around the globe. In short, organizations were immersing participants in a 360° and 3D world where they could interact with that environment to gain new information and/or work on mastering new skills.

The report explored the various types of mixed reality experiences available at that time and how those experiences could be delivered to the learner, plus what the learner could expect in an immersive learning environment.

Participants were able to fully direct their experiences, choose from multiple pathways, and have physical and emotional engagement that included empathy and risk. The technology was rich with data and allowed the participant to take chances with zero consequences.

Immersive Realities for Learning - VR? AR? Mixed Reality (MR) and More
This updated report will explore the evolution of VRLearn into immersive realities for learning and their current impact on the L&D landscape around the globe. We will explore what has changed since VRLearn, what participants can expect through immersive realities in learning, where they fall short, and how these tools are currently used within organizations and industries as part of L&D.

What Has Changed?

- Over the past couple of years, the technology of VR/AR/MR has evolved in multiple ways. Social media sites like Facebook, Instagram, and Snapchat all use AR filters as part of their user experience, giving many individuals the ability to create their own personalized AR experiences through their mobile devices. In an increasing number of cases, social media is the platform through which individuals are first exposed to a form of immersive reality.

- You no longer need to be a coding expert to create an immersive reality experience. There are more resources available to create your own personalized immersive environment that you can share with others. These resources require little to no coding experience and are easily found on the web. In some cases, the resources are free to use. These include websites, software, and apps in the iOS and Android app stores.

- Hardware has become more versatile. It’s lighter, more comfortable, easier to use, and through inside-out-tracking (where the headset tracks hand movements internally, eliminating the need for external sensors) the experience can be completely wireless, giving the participant the ability to physically walk around and explore environments.

- VR sickness isn’t as much of a concern with users. The process of “teleporting”, a method of movement in which the participant uses a controller to travel from point to point instead of simulating the action of walking, helps eliminate the miscue between what our eyes see and how our brains and inner ears process the information (which is what causes VR sickness). Through teleporting, participants can reduce VR sickness and are able to stay in an immersive environment for longer periods of time.

- Companies like Google, Apple, Rio Tinto, Microsoft, HTC, Facebook, Walmart, Volkswagen, Accenture, Delta Air Lines, and others have made commitments to the development and use of a form of immersive reality for training (or for work being done by employees).
• There has been advancement in haptic technology that can give participants specific full-body-force feedback while in an immersive environment. Think of the feeling of being squeezed by a snake or hit by a snowball.

• Social media giant Facebook launched Facebook Reality Labs, a division of the company that is dedicated to its commitment to research and development of immersive reality in social, educational, and personal life.

• The exploration of using VR and AR combined with artificial intelligence (AI), chatbots, blockchain, and smart speakers has opened up new ways to leverage immersive reality as part of L&D and how organizations operate.

• The use of immersive reality has expanded beyond learning. It is now a tool used for marketing and branding, replacing the idea of “product placement” with “product interaction.”

• Immersive reality has gone mainstream in pop culture through movies, high-profile marketing campaigns, TV, books, and music.

• The hardware used to deliver immersive experiences has dropped in price, making VR/AR delivery methods more affordable. On top of that, Facebook launched its Oculus Go headset, a wireless device that delivers a VR experience for less than $200.

### Immersive Environments for Collaboration

There are immersive environments available that allow for teams and organizations to train or collaborate on a global scale. These environments can be private or public and can connect people by simply having them log into a system.

These environments can be accessed through a head mounted display (HMD) like an HTC Vive or an Oculus Rift, but they are not limited to HMDs. Participants can also access some of these immersive environments through WebVR or mobile platforms.

Some immersive environments enable participants to use hand gestures and create virtual objects, and to share with others in the virtual environment. Facebook Spaces, for example, allows participants to use facial expressions and participate in virtual social interaction through different tasks. Though Facebook Spaces facial expressions are limited, participants can convey excitement, happiness, and calmness.

### What Can Organizations and Industries Do in an Immersive Collaborative Environment?

1. Interview potential candidates.
2. Demonstrate products and new ideas.
3. Train employees on a global level.
4. Engage and collaborate with other participants globally in a virtual room.
5. Create on-the-fly private meeting rooms.
6. Invite participants and organizations globally to presentations and trainings.
7. Show slides and video in virtual rooms.
8. Host global interactive meetings in a 360° virtual environment.
9. Attend conferences from work/home.

For Examples of Immersive Environments, see Appendix A.
Where Do Immersive Realities in Learning Succeed?

Immersive tech can be a powerful multi-sensory tool, both psychologically and physically, putting learners into a supercharged digital learning environment where they can experience dangerous scenarios without the risk of actual consequence, but also learn in a personalized environment that they can control and alter. The participant can do things in an immersive learning environment that they cannot do in a real-world learning environment.

A recent study conducted by the Beijing Bluefocus E-Commerce Co, Ltd and Beijing Wisdom iBokan Wisdom Mobile Internet Technology Training Institution showed that the retention rate more than doubled when participants acquired new information through an immersive learning environment vs. traditional methods.

In a study conducted by STRIVR, an organization used VR to bring construction sites into the classroom for training. The results reduced the amount of time in training by 40%.

The data available shows positive results when organizations implement a form of immersive reality in their learning environments. Reduced training times, better performance, faster transfer of skills, and creative thinking are just some of the benefits of this type of learning.

What Can the Participant Do in an Immersive Reality Learning Environment?

Like VRLearn, immersive realities in learning succeed in giving participants learning environments that they can personalize and control, and where they can do things that aren’t possible in a real-world environment, all while enabling a physical and emotional response with risk and empathy playing a large role in the overall experience.

360° Immersive Views of the Workplace or the Learning Environment Provide Opportunities for Contextual Learning

The learner is able to:
- Move around and explore the immersive environment through “transporting.”
- Try things in a safe, simulated environment - without consequences.
- Manipulate, shrink, and enlarge objects in all directions.
- Experience scenarios from multiple perspectives.
- Change their sex and manipulate how they look.
- Move freely in the experience and look through panels and walls.
- Manipulate the laws of physics.
- Interact with AI.
- Collaborate with others around the globe.

Learners Create Personalized Learning Experiences

The learner is able to:
- Control, direct, and customize the course.
- Change their perspective at any time.
- Start over and retry an experience.
- Change the speed of the course.
- Create an experience and share with others.
- Take screenshots or record their experience to share with others.
- Remove or add elements in the experience.
Multiple Pathways Create Multiple Approaches to Learning

The learner is able to:
- Take the test/course multiple times and explore multiple solutions.
- Explore different options/solutions with the freedom to fail without risk.
- Explore multiple failure scenarios.
- Collaborate with other experts.
- Explore new ways to be successful without the worry of wasting resources.

Empathy and Risk Drive Engagement

The learner is able to:
- Feel like they are taking an actual risk and make decisions accordingly.
- Experience a situation from the perspective of another person (e.g. someone of the opposite sex, someone with a disability, or someone with a different nationality). This is called the “In Your Shoes” experience.
- Understand workplace or location-specific cultural etiquette.
- Behave differently than they normally would and experience the effects of those behaviors on themselves and others - without consequences.

Physical and Emotional Engagement

The learner is able to:
- Experience full physical motion in the real world to navigate a scenario in an immersive environment.
- Bring up body temperature and feel tense, causing muscles to tighten up and flex.
- Explore different options/solutions with the freedom to fail without risk.
- Feel emotions like fear, excitement, and curiosity.
- Walk and run through the use of an omnidirectional treadmill.
- Feel objects in an immersive environment through haptic feedback.
- Smell over 30 odors through a special sensory mask.

StoryLIVING

The learner is able to:
- Experience scenarios, new techniques and procedures, and prepare for a difficult task without having to worry about failure or use of resources.
- Experience a story in a much more dynamic way with ZERO constraints.
- Think unconventionally to explore more options and alternate solutions.
- React to many elements of a story and, in return, receive more data.
- Learn new skills through a physical experience.
- Use muscle memory to learn a new skill.
- Experience scenarios over and over, in the same or in altered ways.
- Be a participant and not an observer.

Practice and Fail Forward Often

The learner is able to:
- Attempt tasks multiple times.
- Fail without risk, which encourages them to explore new solutions and be creative in their pursuit.
- Observe a problem, form a hypothesis, test that hypothesis, and continue to try again and again until success is achieved.
- Practice and fail forward, allowing them to be creative in their problem solving. This encourages the learner to keep trying.
- Seek an alternative approach, one that might prove to be faster or more productive than a previously successful attempt.
Social Collaboration Option

The learner is able to:
- Collaborate with another learner or a team - locally or globally - or with AI. The collaboration could be examined from every angle and the learner could move freely from team to team in VR.
- Complete on-the-fly training when needed.
- Open up doors to faster and more productive problem solving.

Data-Rich Environment

The learner is able to:
- Compare success and failure rates from different experiences.
- Compare productivity of various routes taken.
- See a comparison of how they physically reacted in each story or path.
- Contribute data to be used for future training with teams, individuals, or on a company-wide level.

Combine All of the Above to Achieve the Immersive Realities in Learning "All-In" Effect

The learner is able to:
- Be fully engaged. All of their senses are being pushed to make important choices and reactions based on what they see, hear, and feel.
- Explore multiple paths and have physical and emotional engagement, which leads to empathy and a feeling of risk or motivation to complete a task or avoid failure.
- React more naturally. With the ability to “alter” storytelling into storyLIVING, the learner will react differently in each situation.
- Collaborate with others globally in a virtual environment that feels natural and allows participants to explore, stand, sit, and interact.
- Do things they that can’t do in the real world.

Hype Handling for Immersive Realities

Immersive realities in learning can be impressive when experiencing them for the first time. It’s easy to get caught up in the possibilities based on what participants can experience, as well as the data that can be gathered. But immersive learning isn’t perfect and, in some cases, it’s not the right solution at all. When looking at immersive tech for your organization’s L&D, you need to be agnostic. Don’t be taken in by the hype of the technology based on what you might have heard or even experienced for yourself. Use caution, like with any other new approach.

Immersive reality is just one of the many possible technologies/approaches you could bring into your learning environment. With any goal, you need to pick the best method to achieve it. Immersive learning won’t always be the best method for your organization’s goals.

We all learn differently, and some learners may prefer one method over another. Immersive learning should be considered as one option in the learning environment: not the only option.

It’s good to be excited about immersive reality, but you should be agnostic in your approach to leveraging it as a mechanism in L&D.
Questions You Need to Ask Before Choosing Immersive Realities for Learning:

- Is there a simpler way to get the same results?
- Is there content available specific to your training needs?
- Are you able to create content specific to your needs?
- How do you deliver the experience to employees and what method do you use?
- Are you using the right form of immersive learning to achieve your goals?
- Is your team prepared for an immersive realities learning environment?
- What is involved with bringing AR/VR/MR into your L&D efforts?
- How much could this cost?
- Is the immersive learning environment scalable?
- Are you caught up in the hype of immersive learning?

Some of the Challenges and Limitations of Immersive Realities in Learning

- The technology used in an immersive learning environment still doesn’t provide the learner with true physical feedback. An object that would normally be immovable or heavy in the real world doesn’t feel the same in an immersive world. Some organizations have built physical structures to match their virtual world, which do provide equal physical feedback in both worlds when it comes to structural environments, but hand-held objects and items within the virtual world do not provide the same experience.
- The immersive learning experience can be short with the participant being passive.
- Some immersive learning environments do not allow the participant to direct the experiment. Instead, they are guided or have limited options.
- The cost of a large-scale immersive tech hardware distribution could be high.
- Compatibility can be an issue.
- An environment for immersive realities in learning relies on connectivity and power. Both are essential to deliver any form of immersive learning. In some parts of the globe, it is a struggle to receive information or updates.
- Getting employees up to speed on the technology behind an environment for immersive realities in learning may be difficult.
- This approach is not yet mainstream, so getting an organization or an entire industry behind an approach for immersive realities learning could be difficult.
- Immersive learning environments aren’t easily adopted. They take time, resources, and training on AR/VR/MR. For some immersive learning experiences, an HMD is required for the user. HMDs can be uncomfortable and cumbersome to wear for long periods of time.
- You may struggle to get approval for immersive tech learning from your compliance officer.
- Some participants could still experience VR sickness, which is when one feels dizzy or disoriented from the immersive environment.
Types of Immersive Reality Experiences

- **Virtual Reality** – VR is a multimedia or computer-simulated reality that creates a full 360° immersive experience for the user. Users can experience VR with only 360° video or 360° photographs but can have a more immersive experience if they use audio and video together (vs. just video or photographs). In order for VR to be truly immersive, the audio cues need to match the visuals so the brain fully processes the VR experience. This immersive environment can be similar to real-world experiences and locations, or to fantasy-based locations, by using 360° photos, 360° video, or a VR simulation to immerse the user.

- **Augmented Reality** – AR combines VR with the user’s view of the real world to provide a composite view. A computer or mobile device superimposes VR images over the user’s real-world environment. Examples of this can be seen with a Microsoft HoloLens. Another example is your mobile device showing a route to a destination using arrows and street turns.

- **Mixed Reality** – MR is when digital and physical actions interact with each other in real time. This experience is mostly seen when a video game player’s physical form is actually part of the game play. This is made possible by using a green screen, a real-time camera, and foreground and background images from the game play. A software product called Open Broadcaster is used to merge the digital and physical images. The participant uses a controller to emulate hands in order to lift up objects, throw them, etc.

- **Merged Reality** – Not to be confused with mixed reality, merged reality is different in the sense that users can use their actual hands in the experience. Users can manipulate the AR object by holding a physical object that uses special markers to launch the AR experience over the physical object. The user can then physically hold AR in their hands with the help of a mobile device, a tablet, or an HMD. Through merged reality, users are able to physically navigate storylines, information, and virtual images. They can also share the objects with others simply by handing over the physical object.

- **Audio AR** – Audio AR uses audio content to enhance the object you are looking at through a pair of special glasses called AR glasses. Audio AR “sees” by using on-board motion sensors that can detect precisely which direction you are facing, plus GPS location, to detect objects like buildings and businesses, as well as information from social media sites like Yelp and Facebook. The concept of Audio AR was developed by Bose and made its debut at the 2018 SXSW Technology Conference.
How Immersive Reality Experiences are Delivered

- **Tethered Headset VR** – The user can participate in a VR experience by using a VR-enabled computer with a tethered VR headset (also known as a Head Mounted Display - HMD) like Facebook’s Oculus Rift, PlayStation VR, or the HTC Vive. The user has the ability to move freely and interact in the VR environment while using a handheld controller to emulate VR hands. But, the user has a limited area in which to move about because they are tethered to a computer.

- **Non-Tethered Headset VR/AR with Inside-Out Tracking** – These devices are headsets and computers built into one system, also known as Standalone Headsets, where users are free of any cables limiting their movement. Like tethered headsets, these devices can deliver a 360° immersive experience, though maybe not as robust. Users are able to move around in the virtual environment as well as interact with and manipulate objects. These devices use a technology known as inside-out tracking, which allows for hand tracking during the experience, but without the use of external sensors. Examples of these headsets are the HTC Vive Focus and Oculus Santa Cruz for a VR experience. Also, Microsoft’s HoloLens and Google Glass both deliver an AR experience.

- **Mobile Device Inserted into Headgear** – To experience an immersive environment, the user inserts their mobile device into a Google Cardboard, Samsung Gear 360°, or any other type of mobile device headgear, along with headphones (optional). This form of immersion doesn’t require the user to be tethered to a computer and most of these VR experiences can be 360° photos, videos, and interactive scenarios.

- **Mobile Virtual Reality** – The user can access VR without any type of headgear simply by using a mobile device and headphones (optional). They can still have many of the same experiences that they would through Google Cardboard or any other type of mobile device headgear. Although they don’t get the full immersion that they would with headgear, they are still able to experience VR. Currently, this version of the immersive experience seems to be the most popular because it only requires a mobile device.

- **Mobile Augmented Reality** – Users are able to experience an AR environment through a mobile device by utilizing a camera in a smartphone or tablet.

  1. Developers are able to create custom experiences for any iOS device through software called ARKit.
  2. Developers can create custom experiences for any Android device through a software called ARCore.

  Both ARKit and ARCore can be delivered to the user through custom apps and are easily updated through those apps. Examples of mobile AR experience providers are JigSpace, HoloGo, and Orb. Other examples include social media AR apps like Facebook, Snapchat, and Instagram.

- **WebVR** – WebVR is any VR experience that is delivered through a website. Though it doesn’t fully immerse the learner, the learner is able to manipulate objects and explore 3D worlds through a trackpad, keyboard, or computer mouse. There isn’t a physical experience, but there is some emotional feedback through empathy.

- **Computer Hardware Sensor VR and AR** – Non-mobile and non-headset platforms like Leap Motion use depth sensors to create a VR and AR image of one’s hands on a desktop computer or through a special HMD; they emulate hand gestures in real time. This technology could be used for anything from teaching assembly in a manufacturing plant, to learning a step-by-step process, to medical training.

- **Physical AR** – This form of AR uses any mobile device that runs iOS or Android software, combined with a physical object designed to provide a merged reality experience that users can physically control with their hands and various screen swipes. Providers of this type of experience include MergeCube and YeeHaw Wand.
How Organizations are Using Forms of Immersive Reality Learning Experiences in L&D

Immersive learning is finding its way into more L&D environments as organizations look for alternate classroom methods that support efficiency and deep learning.

Organizations are turning to immersive realities in learning because they can be incredibly diverse tools for multiple layers of the classroom and the work environment.

Examples of where immersive realities in learning are being used in the workforce include:

- Recruitment
- Onboarding
- Employee Job Training
- Transfer of Skills
- Role Reversal
- Continued Learning and New Process/Procedures
- Assembly
- Certification Training
- Leadership Training
- Sales
- Performance Support
- Scenario Training
- Equipment Training
- Refreshing of Skills
- Collaboration
- Remote Work
- Team Building/Development
- Customer/Client Engagement
- Marketing/Branding

For Examples of Organizations Using Immersive Realities in Learning, see Appendix B.

Creating Your Own Immersive Realities for Learning

For immersive technology to evolve and be successful in the learning environment, content is essential. To help push the agenda of content creation with immersive learning and experiences, a number of resources are now available to create simple, easy-to-use tools to build your own 3D models and AR/VR environments.

Many of these development tools have eliminated the need for extensive coding knowledge to create an immersive environment, while some resources are very close to a “plug and play” model for creating scenarios and environments. Although coding experience would be helpful when building your immersive learning environment, it isn’t necessary.

These tools can be used to build your own custom immersive experience that could be specific to your industry and accessed via multiple delivery platforms.

Development tools for immersive experiences are available in various formats through the web and software, as well as iOS and Android apps.

For Examples of Resources to Build Your Own Immersive Learning Experience, see Appendix C.
Key L&D Questions You Should Be Exploring as You Investigate and Experiment with Immersive Realities in Learning in 2018

- How difficult is it to create this type of learning?
- How difficult/different is the instructional design skill set for this type of learning?
- How can we scale and deliver global programs given the necessary hardware investment and maintenance costs?
- What type(s) of learning content fits immersive technology best?
- How easy is it to update content?
- How do we contract with a VR development company to get a customized game design - on a budget?
- What value do Immersive Realities in Learning really provide in the learning cycle (vs. just adding the “cool factor”)?
- How do we get it approved by the Compliance team?
- Can we plug immersive simulations into an already-built ecosystem?
- How do we construct an immersive-realities-in-learning development team?
- How can we make immersive learning more accessible and cost effective?
- Do we have access to the key tools that are used to create custom immersive learning programs?
- How are other organizations in our industry using immersive realities in learning?
- What hardware works best for what we need to achieve?
- How can this be used for leadership development?
- How can these technologies be adopted in an effective manner, keeping ROI and attainment of performance objectives in mind?

What is the State of Immersive Realities in Learning in 2018?

Immersive realities in learning are growing rapidly around the globe. More and more industries and organizations are being creative in their approaches, using gamification of AR and VR experiences or custom-built experiences to help boost their L&D. Organizations have access to tools to create their own unique immersive learning experiences, based on the information they want to transfer to their participants, through multiple, free AR and VR software options. The freedom of being able to develop a custom AR app makes it easier for an organization to focus on its specific learning goals and individual tasks.

AR filters in social media apps like Facebook, Instagram, and Snapchat have made the idea of immersive tech more familiar to users. With many AR apps found in the iOS and Android stores being downloaded for shopping, entertainment, and learning, immersive realities are slowly starting to play a larger role in how we socialize.

Immersive realities in learning are gaining traction around the globe. Although they don’t provide perfect solutions, they offer another layer to L&D, one that can be manipulated in many ways and place participants in extreme experiences: something that traditional learning can’t always do.

This is a concept on the radar screen of many organizations and industries. So, how do we use it to improve L&D, create a more efficient work environment, and get positive results - without disrupting our current environments?

Immersive realities in learning are evolving and have definitely found their way into the workforce. Though their current footprint in L&D is small, it is deep, and organizations and industries are paying attention.
The Future of Immersive Realities in Learning

Immersive realities in learning will have future roles; how big those roles will be is still undetermined. What we do know is that immersive technology is being used more and more each day in some capacity within organizations all over the globe. To help push the agenda of immersive realities in learning forward, companies like Microsoft, Google, and Facebook have committed to the development of immersive technology and the role it can play in our everyday lives as well as in our work environments.

Today’s K-12 Student Becomes Tomorrow’s Employee

To understand where immersive realities in learning are going, we need to look at the K-12 learning environment.

The current K-12 environment is dedicating more and more time and resources to the idea of immersive tech in the classroom. Devices like MergeCubes and Oculus Rift headsets and websites like Google Expedition are becoming common, playing larger roles in the classroom and giving students exposure to multiple forms of immersive tech at a young age. Students are learning how to code 3D objects and are exploring multiple environments and scenarios through VR and AR. They are also able to share and collaborate on ideas through immersive realities in learning. As learners move on through K-12 and higher education, the idea of an immersive learning environment becomes the norm for them and will be an expectation for their future learning environments. These current students (and future employees) will have used immersive realities in learning almost daily. They will be comfortable with this style of learning as they continue their education, which will eventually extend into the workplace.

There are still many questions about the roles that immersive realities in learning will play in the workforce, but it is safe to say that a variety of roles will exist at various levels within our workplaces.

Chatbots/Smart Speakers/AI/Wearables/Blockchain

Immersive learning environments need to grow beyond their current states to become trusted parts of modern L&D. To do this, immersive realities in learning need to incorporate new ideas that are being explored within organizations and industries. How could immersive learning and chatbots benefit your L&D, or how could blockchains and smart speakers leverage immersive learning environments?

For example, one organization is merging VR and AI to teach robots simple tasks – without having to write any code. Using VR, they show the robot the task, and the robot, using AI, repeats the actions it has been shown until it has mastered that task. What normally takes months and months of coding has been reduced to less than an hour of work.

For Examples of Immersive Realities with Chatbots/Smart Speakers/AI/Blockchains, see Appendix D.
Bobby Carlton’s Personal Conclusion
Contracted Author

The new workforce has a busy, fast-paced, modern culture where the learning environment needs to be flexible. Of course, modern L&D still needs to rely on traditional training to teach, sharpen, and transfer new skills to employees, but the learning environment also needs to accommodate on-the-fly training. In some cases, the employee doesn’t know what they need to learn until they are faced with a task on the job.

The modern classroom needs to be an environment that can get straight to the point without losing or abbreviating the information. Immersive realities in learning show that the classroom can be flexible while giving the learner the ability to customize the lesson without watering down the information.

There have been a lot of advancements in hardware, software, and web applications that are used to deliver immersive learning environments. We have seen hardware become more comfortable and easier to use. Software is making virtual environments more realistic through technology like AI, which makes digital interactions more realistic.

The wave of wireless and affordable VR/AR is here with hardware like Facebook’s Oculus Go. Lowering the price of the headset opens up more possibilities for individuals to explore the idea of immersive reality on their own time, using their own equipment.

While interest in immersive realities in learning is growing, the technology and concepts are still evolving and trying to find solid footing in L&D. We need more data, more case studies, and more adoption. Until then, immersive realities in learning will be approached with great curiosity and also great caution.

In my 2017 VRLearn report, I said that I felt that the future of immersive tech wasn’t with hardware; rather, that it was about the experience delivered to the learner. I still believe that. It needs to be an experience that evokes a physical and emotional response from the learner. The experience needs to stoke the coals of innovation and curiosity, but it also needs to let the learner fail without consequences. The hardware is just the delivery method. The experience is what will matter.

I do feel that there is a bigger future for immersive realities in learning. With each evolution of the technology, we do get closer. Organizations and industries that use a form of immersive learning are being creative in their approaches and it helps that many large organizations have committed to some level of immersive technology learning.

For now, the idea of immersive technology learning is on the radar screen of many organizations. They just need to figure out the best way to bring it into their environments without completely disrupting the current workflow.

Ask yourself, “Do we just leap into the pool? Do we dip our toes in first and then inch our way into the pool? Do we just not enter the water?” These are all valid questions when it comes to immersive realities in learning.

In my personal opinion, if organizations and industries don’t explore this type of learning now, they’ll be left behind and will spend a lot of resources and time trying to catch up later.

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Bobby is a writer for VRScout, a publication dedicated to exploring new advancements in immersive reality that could impact human potential. He also explores immersive reality’s role outside of the gaming industry – as an L&D tool and as a mechanism to build consumer engagement through marketing and branding. He has partnered with organizations like Siemens Technology, Motorola, and NYS DOT to consult on their initiatives to bring AR/VR elements into their work landscapes. Bobby is a frequent presenter for the Western Washington University Digital Marketing Class in Bellingham, WA (on the role of immersive realities in marketing and branding) and a regular guest technology expert on UK Talk Radio Programs like The Gadget Hour with Andy Jaye, The Two Mikes, and Adam Catterall. Bobby was recently asked to join a panel of other VR industry experts from around the globe for the annual 2018 VR Awards.
Appendix A

Immersive Environments for Collaboration

- AltSpaceVR
- Rumii (Doghead Simulations)
- Facebook Space
- VRChat
- Cisco Spark
- Oculus Rooms
- IrisVR

Appendix B

Examples of Organizations Using Immersive Realities in Learning

- Volkswagen – The Volkswagen group made a commitment in 2018 to train 10,000 employees in areas like vehicle assembly, employee training and development, and customer service.

- Choice Hotels – Choice Hotels uses training videos linked to AR apps that allow learners to point their smartphones at posters, computer screens, workbooks, etc. and watch informative videos. They are also working with a VR company (Mursion) to do role playing with “live” avatars.

- Walmart – Walmart is using VR to train employees in how to prepare for sales like those on “Black Friday” as well scenario training for customer complaints. The company even purchased a VR startup called Spatialand to create its own custom VR learning experiences.

- Accenture – Accenture is using various immersive reality delivery methods ranging from cardboard solutions to Oculus Rift for leadership training, presentation skills, L&D, and immersive gaming.

- Citibank – Citibank is exploring the idea of using AR to create holographic workstations in which employees could work and collaborate with other team members.

- Axalta Coating Systems uses multiple VR approaches:
  - An all-in-one system called SimSpray that utilizes VR hardware paired with a custom sensor and custom “Spray Gun” controller.
  - Google Cardboard VR app that gives customers a tour of a flagship customer experience center.
  - Experimenting with a virtual paint-spraying game as a learning tool. Input goes to instructor-led training with the VR output fed into the Livestream system as a video to show students.

- Viacom – Viacom is using AR codes on classroom handouts that link to class content.

- KBR – KBR is using a gambit of immersive technology delivery methods for safety training on hazardous processes and equipment. These include Oculus Rift, HTC Vive, HoloLens, and tablets/smartphones.

- UPS – UPS uses VR to train drivers to spot potential hazards on the road.

- Linde – Linde uses VR to train drivers to safely handle hazardous materials.

- Pfizer – Pfizer uses Virtual Classroom Training as opposed to the live classroom environment.

- Booz Allen Hamilton – BAH is using VR to enhance the onboarding experience and as a method to enhance clients’ training programs.
Appendix C
Resources to Create Your Own Immersive Learning Experience

- Amazon Sumerian
- AppyPie
- ARCore (Google)
- ARKit (Apple)
- Blippar
- Google Poly
- Jigspace
- Mirra
- Orb
- Placenote
- Roomful
- Sketchfab
- Snapchat
- Strata
- Unity
- Unreal Engine
- ZapWorks
- Zappar

Appendix D
Examples of Immersive Realities with Chatbots/Smart Speakers/AI/Blockchains

- We could give chatbots a face for better data collection, interaction, and human action.

- Chatbots can utilize facial recognition and speech pattern through immersive technology to understand questions, commands, and emotions, and for conversations or to adjust tones of the conversation with participants.

- Chatbots combined with AI and VR could assist in customer support, employee training, on-demand learning, and help desks.

- A chatbot with AR or VR could bring a new level to the learning experience. A robot could teach humans and be able to respond to questions and understand if there is confusion.

- We could use immersive technology combined with chatbots, smart speakers, and AI for more robust, 24x7, on-the-fly training or customer service that would eliminate wait times.

- We can create a personalized experience. Customers or employees can choose a VR/AR avatar that they relate to.

- We could use immersive learning with blockchain technology for a larger view of progress, changes in L&D, or of the full organization in real time, increasing our ability to make changes as needed.

- We could use immersive realities in learning with smart speakers for curation and more efficient engagement with learners.
Immersive Realities for Learning and Performance
“VR, AR, Mixed Reality & More in 2018”
An Updated Report from The MASIE Center
Author: Bobby Carlton | Foreword: Elliott Masie
May 23, 2018

Elliott Masie’s Learning CONSORTIUM is a 20-year-old vendor-neutral collaboration of over 200 global companies. It is a non-stop source of learning exploration, common work projects, and access to innovative research and development activity. Never in history has learning been more energized, challenged and stretched by changes in content, social media, collaboration, technology and business shifts. The Learning CONSORTIUM is a unique collaboration of organizations with shared passion about the future of learning.

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