

Virtual Reality for Our New Reality

Your Guide to VR
Training Programs



BROUGHT
TO YOU *by*  SWEETRUSH.



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Introduction

Virtual Reality for Our New Reality

Promise, proof of concept, and a pioneer spirit have led us to this moment: Virtual reality is reaching a critical mass of adoption. Informed by successes in media and gaming, VR training is the new frontier of technology-enabled learning. From hospitals to hotels, the shop floor to retail stores, **VR has proven to be an unparalleled tool to immerse learners and capture their attention in a way nothing else can.**

And now, in our post-COVID world, the future of learning is virtual. All of us in L&D are setting our sights on how we transform in-person training to virtual. Interruption of business travel and interruption of training were rated 4.57 and 3.55 respectively on a five-point scale as challenges facing L&D.¹

In the same study,

63%

of organizations with 1,000-plus employees said **their staff is ready for digital learning,** and

48%

are **establishing guidelines for virtual learning.**

¹ <https://www.brandonhall.com/blogs/covid-19-how-hr-is-responding/>

² <https://edition.cnn.com/2020/05/15/tech/apple-nextvr/index.html>

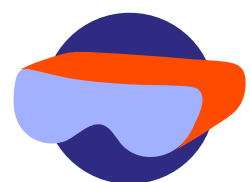
We see this moment as an accelerator—we can apply VR in ways that can positively impact the world and make effective virtual training.

With our new reality, VR is not only a path to innovation, it's a path to bringing us together safely.

And big players are in the mix, including Meta (previously known as Facebook), HP, HTC Vive, and most recently, Apple's acquisition of NextVR,² betting on the power of this game-changing technology.



So let's dig in. What are your biggest questions about using VR for learning and development? Are you ready to explore or scale up? **We've put together this guide to break through the complexity and confusion, shine a light on how VR can address your learning needs, and help you launch effective VR learning programs.**

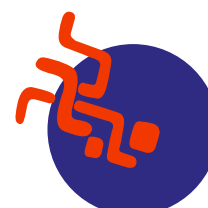


What are the proven, effective use cases for VR in learning?

As learning professionals, we know that two concepts hold true: No technology is a silver bullet to address all performance objectives, and one size does not fit all. **VR is a powerful tool in the L&D toolkit, made even more so as part of a holistic, blended learning design.** In VR, learners can practice myriad skills—from safety to sales, soft skills to technical—in a repeatable, scalable, fully immersive way.



[Teleport to Chapter 1](#) ▶▶▶



What can VR training offer in terms of analytics?

This is one of the most exciting areas of development in the VR training space. **If you're interested in adaptive learning, continuous improvement, and tying user data to performance outcomes, VR offers a whole new world of analytics.** Added to evaluation data outside the headset, it's a powerful combination for learning measurement.



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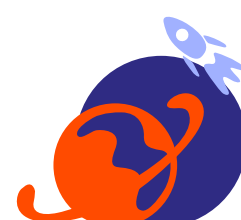


What about cost and ROI? How do I get buy-in for the investment in VR?

The good news: Market conditions are driving costs down as hardware manufacturers race to capture the enterprise space. The better news: Examining the hidden costs of training and being strategic about how you introduce VR will help you shape your ROI picture and get leadership onboard.



[Teleport to Chapter 2](#) ▶▶▶



What can we expect for the future of VR?

It sounds trite to say that the future is here already—but the truth is VR is evolving at breakneck speed. New collaboration tools enable a multi-learner experience, and we can give special control to instructors. Real-time data from facial and voice recognition, body tracking, and biometric feedback can be used to give the learner feedback or alter the learning experience. **R&D is the heart of VR, making what seems like science fiction a reality.**



[Teleport to Chapter 4](#) ▶▶▶





How do I find the right VR partner?

If you're excited to pioneer and bring innovative new technology to your organization, **key to your success is finding an L&D partner you can trust that can simplify the process and guide you from conception to final product. Our checklist is a must-have for evaluating vendor-partners.**



[Teleport to Chapter 5](#)



Can you show me some examples of successful VR training programs?

Along the way, we'll share many examples from programs we've developed and insights from our team, culminating in an in-depth case study of a game-changing VR program that teaches health care workers how to de-escalate aggressive behavior. You'll definitely want to check that out.



[Teleport to Chapter 6](#)



Ready?

Strap on your headset and let the journey begin.



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Chapter 1

Training for the Modern World:
Proven, Effective VR Use Cases

Four years ago we saw the power of VR for learning and created the **SweetRush SPARK** team, dedicated to bringing immersive learning to our clients. Most clients have taken the same path, starting with a proof of concept. What comes next? Collaboration, invention, and overcoming challenges—and a learning program beyond what they imagined.

The fun doesn't stop there. The program launches, and they now have excited learners and effective learning. Validation and leadership buy-in. This creates a jolt of new energy and inspiration for L&D...paving the way for new programs and further innovation.

So, how do you prepare to take that first step into VR? How can VR be an effective tool to help you transform face-to-face learning to virtual?

When an L&D organization takes the first step toward VR, the game-changing results drive momentum toward further investment and expansion.



In this chapter, we'll first take a look at efficacy through the lens of instructional design. Then we'll examine how VR can impact the business side of L&D. Finally, we'll highlight use cases for different types of training, including examples. I guarantee by the end, you'll have a long list of possible VR training programs in your mind's eye!

Instructional Design and VR Efficacy

Immersive Learning and Attention

Capturing and keeping learner attention is one of our biggest L&D challenges. It directly influences retention of what's learned. Research validates what we already know if we've fidgeted through a long lecture or clicked through a long, low-interactivity eLearning course—attention spans are limited, and retention and recall suffer when attention drops.³ **Workplace distractions are rampant**, from chatty coworkers to office noise to employees' own smartphones.

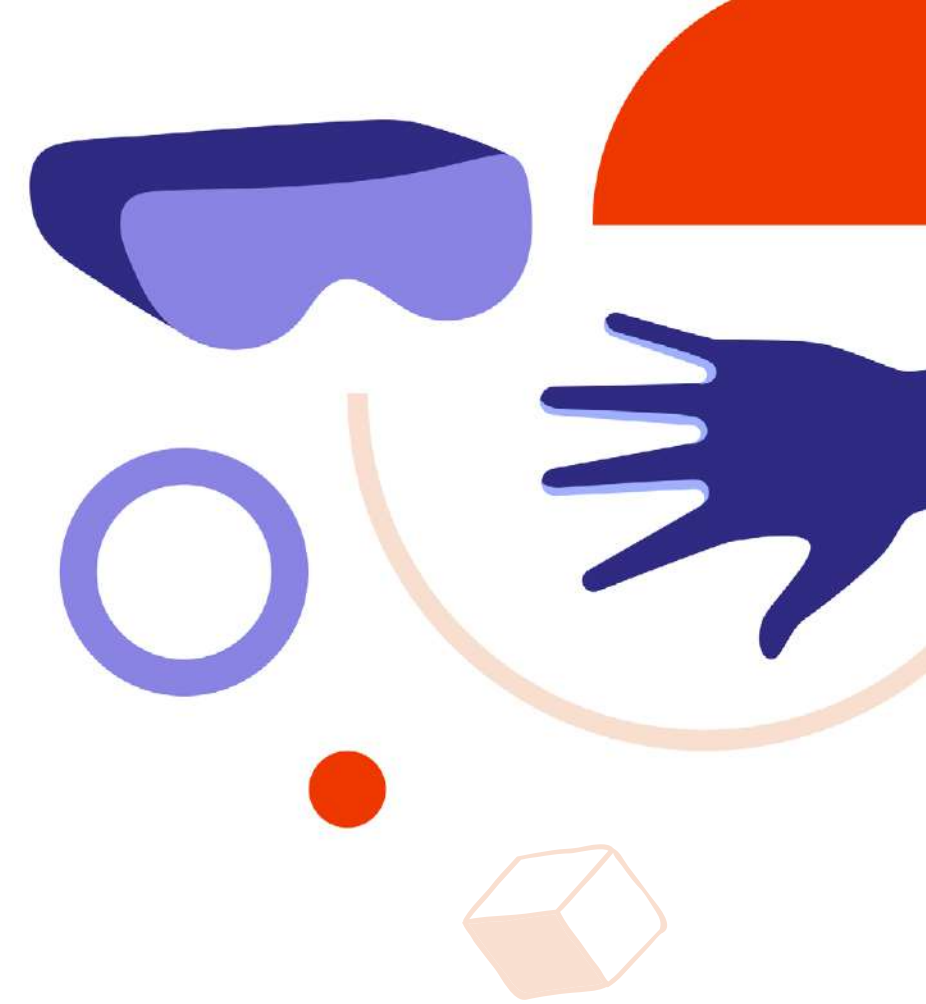
74% of millennials and Gen Z report being distracted at work.⁴

3. <https://journals.physiology.org/doi/full/10.1152/advan.00109.2016>

4. https://research.udemy.com/wp-content/uploads/2018/03/FINAL-Udemy_2018_Workplace_Distraction_Report.pdf

Not exactly conducive to focused attention for learning, especially virtual training. And lower retention and recall ultimately impact application on the job, learning effectiveness, and ROI.

Overcoming this challenge means raising the bar on engagement using one or more of a variety of instructional techniques: interactivity, storytelling, scenarios, simulation, gamification, etc. But VR has its own special advantage—the headset blocks the outside world. **Full immersion means no distractions from coworkers or smartphones.**



We're seeing very promising research on VR, retention, and recall.

Miami Children's Hospital, which is using VR to train medical staff on a variety of procedures, reports that its **VR program had an**

80% **retention rate**
one year after training

compared to 20% one week after traditional training.⁵

Imperial College of London reported that

83% **of surgeons could go into a**
lab environment with minimal
guidance after learning in VR

compared to 0% using traditional methods—fueling a significant investment in VR training from Johnson & Johnson.⁶

Though let's be clear, these success stories cannot be exclusively attributed to immersion and engagement—and that's a perfect segue into other reasons why VR is effective, from experiential learning to scalability, consistency, and repeatability. **Read on!**

5. <https://www.fiercehealthcare.com/it/virtual-reality-for-medical-training-how-it-benefits-hospitals>

6. <https://venturebeat.com/2019/09/25/johnson-johnson-we-want-vr-surgery-training-to-be-available-worldwide/>

Blended Learning: Practice

Learning is not a one-time event; effective learning programs embrace the many facets of how people learn. **Context/demonstration, self-reflection, reinforcement, performance support, and critically, practice.**

VR is designed for practice. Storytelling and scenarios immerse learners in real-world situations. They can face challenges, manipulate objects, identify problems—in a virtual world as close to their work environment as possible. **They can, and will, repeat the experience, deepening the practice and aiding retention and recall.**

VR can be the cornerstone of your blended learning program, supported by other modalities (e.g., eLearning, video, virtual instructor-led training, group activities, coaching), to create an effective learning journey.



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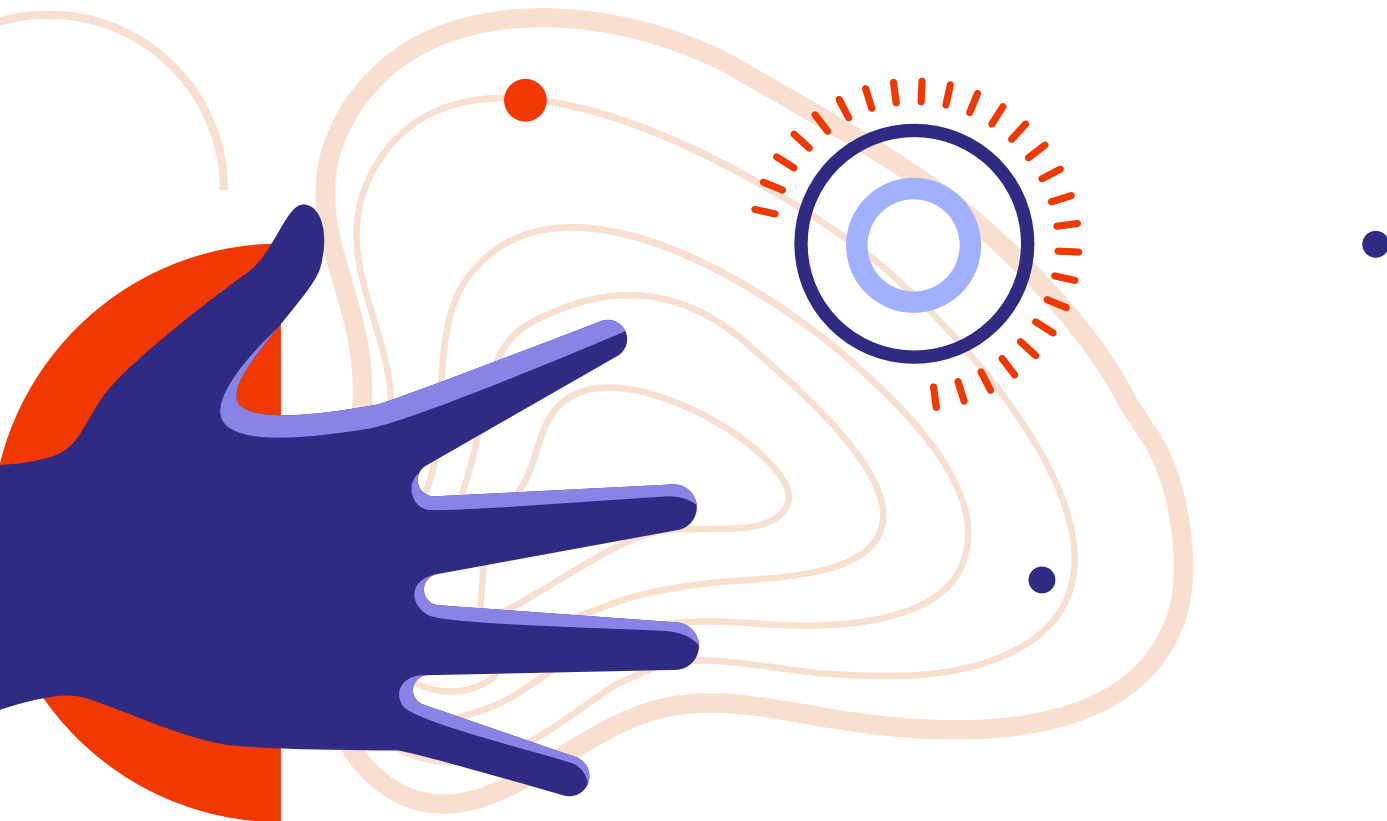
to see how we **put instructors inside**
the VR experience.



Experiential Learning

Effective learning means learning by doing.

When you can't physically put them in the environment (see *The Business of Learning*), **VR, done right, can be a close second or even preferable to the real thing.** Until someone builds a holodeck, simulations in VR are the closest we can get to the real world—and they can be remarkably realistic, and importantly, safe environments to practice. Learners can perform tasks, manipulate objects, explore environments, and, hands-on, experience what we need them to learn.



7. https://www.cjr.org/tow_center_reports/virtual-reality-news-empathy.php

Safe Environment to Practice

Training can be dangerous and costly: potential for risk to one's personal safety and risk to the business through making mistakes. **As L&D professionals, we need to make it safe—and still give learners the best opportunities to practice, learn, and improve their performance.** VR is as close to the real world as you can get, while being far removed from anything that can cause harm to your learner or your organization.

Multiple Perspectives and Empathy

In VR, learners can experience what it's like to be in any situation—from the perspective of anyone in the situation. They can experience multiple perspectives in the same program. It's the old adage, "You can't understand someone until you've walked a mile in their shoes" on steroids. Columbia University's Tow Center for Digital Journalism found that news stories presented in VR using multiple perspectives "prompted a higher empathetic response" compared to static photos and even provoked a "desire to take action."⁷ If you're looking to build empathy and understanding in your organization, VR is an effective tool.



How Hilton Uses VR to Teach Empathy

Hilton hires thousands of new corporate team members every year, few of whom have hands-on experience working in hotels. Yet they set policies that can inadvertently make hotel team members' lives more challenging.

Senior leaders often have a chance to visit hotels, but it's not feasible for all new corporate team members to get immersed in hotel operations in this way.

Hilton collaborated with our SPARK team to create a new VR training program, called Hotel Immersion, for corporate team members. The experience includes a hotel tour and three hands-on operational tasks: setting up room service trays, checking in guests, and cleaning hotel rooms.

“

Our goal was to make our corporate team members virtually sweat. We want them to understand the physicality and complexity of hotel operations so they can better feel what it's like to be in the shoes of a room service attendant.

— Blaire Bhojwani, Hilton's Senior Director of Learning Innovation

The results:

75%

walked away reporting that it **improved their problem resolution and customer service skills.**

94%

said it **bolstered team members' sense of empathy** during its trial launch.

Bonus Result:

All of us who worked on the project have empathy for and greatly appreciate hotel housekeeping!

[Read more and see a video](#) on Oculus by Meta website.



Storytelling and Branching Scenarios

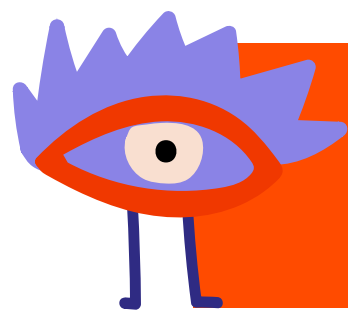
Research shows that **using storytelling in learning:**

- › Increases attention⁸
- › Helps us reach higher cognitive levels in learners⁸
- › Offers variety that keeps learning interesting⁸

Humans are designed to learn through story. In VR, we apply this research and use storytelling to enhance the learning.

Narrative is the underpinning and woven throughout—as simple as an orientation to the scenario and instructions for the activity to perform, or as complex as non-linear branching and alternative outcomes based on the decisions learners make.

Because VR is self-paced and repeatable, learners can explore the depths of a story by taking alternative paths and reflecting on the experience.



Check out ▶▶▶

VR Overcomes the Limitations of Role Plays

8. <https://ieeexplore.ieee.org/abstract/document/6132918>

Self-Paced, Repeatable, Short Bursts

Adults learn best when they have autonomy over their learning experience. Like other types of asynchronous learning, VR puts learners in the driver's seat. They can go at their own pace, repeat the experience, and, if you've included branching, explore alternative paths. They can repeat the training and get multiple practice sessions, rather than one-and-done.

Also, **VR is best suited to short burst training—10 to 20 minutes is the sweet spot.** This type of learning design creates space to process and reflect on what they've seen and experienced inside the headset (either self-reflection, in groups for social learning, or with an instructor/coach, depending on your blended learning design).

Influence of Games and Integration of Game Theory

Chances are you first heard about VR as a gaming platform. **VR learning design can embrace game design, when appropriate for the audience and learning objectives, in ways that enhance instructional effectiveness.**

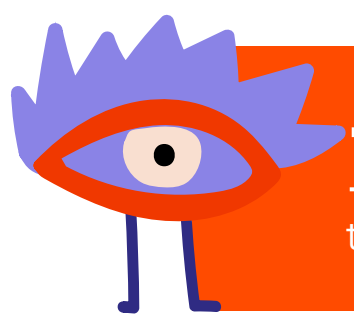
As in game design, the interweaving of narrative and challenge in VR learning creates empowerment and agency. Timed activities can reflect the urgency of real-world situations. Even how we onboard learners can be inspired by games, which are designed to get users engaged and playing as quickly as possible. The appeal of games is universal, and when their power is harnessed correctly, it can elevate engagement and efficacy.



Social Learning and Facilitated Learning

The biggest risk in transforming face-to-face training to virtual is losing the human connection—it's what makes in-person workshops so popular.

VR hardware manufacturers are developing collaboration technology—and VR content developers are leveraging that technology (and building our own) **to create tools that enhance social learning and the role of the instructor/facilitator.** These include multi-learner experiences (two or more people, represented by avatars, learning together in the VR space), and experiences in which instructors can lead and control what's happening in the VR environment and learners must react in real time.



Teleport to Chapter 4

to check this out. ▶▶▶

VR Overcomes the Limitations of Role Plays

Role plays are a time-tested practice and application technique often included in face-to-face training. Yet any instructional designer or instructor will tell you: They have their limitations. Their tendency to elicit audible groans from a class is probably the biggest tell.

Learners are asked to “act” as a character. Backstories are typically limited, as are learners' acting abilities. The result? They don't really feel that they are in the situation. There's no suspension of disbelief, and therefore no immersion, which means they can't connect with the emotion of the experience and react in an authentic way.

The key to hospitality and exceptional service is having empathy for guests, and a global travel company had tried to teach empathy with traditional role plays for years. It wasn't working. Working together, we found a new way to elicit understanding and build empathy—with VR.

We could have simply converted the role play from face-to-face to within VR; the technology exists to do so. But we discovered a better way: **Have the learner actually experience what it's like to be a guest.**

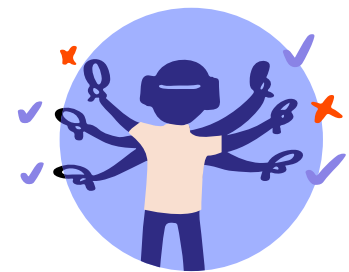
We created a program that links five guest situations (e.g., a long line at the front desk, broken coffee pot in the room) in an overarching story. In each scenario, learners experience three different ways that a hotel worker tries to remedy the situation—and they must pick the best one. They must also identify how they feel after each less-than-stellar experience.

Emotional connection, authentic response—as close to the real-world guest experience as possible. Addressing the same learning objective (to build empathy) in an innovative way that trumps the traditional role play.



The Business of Learning and VR Efficacy

We've covered what makes VR effective from an instructional perspective. Let's take a look at how VR can address the business/organizational challenges for which VR can be an effective solution.



Accelerate Performance Improvement

Mistakes, quality issues, and inconsistency affect your bottom line. VR learning offers scalable, repeatable practice that helps people perform their jobs more accurately and get to this higher state of accuracy more quickly.



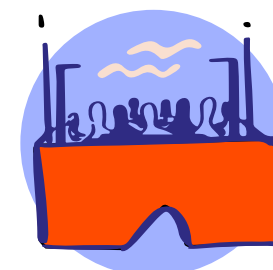
Hard to Replicate and Scale Training

VR makes the impossible possible. Early applications of VR training include flight simulation and training for medical surgeons. Think about what work environments are difficult or impossible to replicate that may also impact scalability of training—these are your top candidates for VR.



Reduce Cost of Travel

All of the financial reasons you've chosen to convert in-person training to eLearning or some other virtual modality, same applies here. Instead of sending someone to a conference room in Toledo, you can create whatever learning environment and activities you want—once—and then leverage it year over year.



Reduce Disruption and Logistics

Travel isn't the only cost associated with training. Do you need to close a location, arrange for high-level and busy staff to give tours, keep an airplane grounded? Disruption, logistics, planning, and opportunity costs hit your bottom line. The up-front investment in a VR program can be far less than these costs that add up over time.



Reduce Costly Mistakes

Does your current training program offer a safe environment to practice? What are the consequences of mistakes on an individual or the organization? VR simulation is unparalleled as an immersive, effective, and safe virtual environment in which to practice.



Attract Top Talent and Younger Generations

If you're not yet thinking about learning and development as a recruitment device, well, it is and it's a good time to start. Millennials and Gen Z report their most important desire for a first job is opportunity for growth, and lack of growth⁹ and learning opportunities are top reasons they'll exit.¹⁰ VR learning speaks their language—and shows you care about providing them with innovative learning programs.



Teleport to Chapter 2 ▶▶▶

to learn more about **cost, ROI, and how to gain buy-in for VR programs.**

9. <https://www.modis.com/en-us/resources/white-papers/what-millennials-and-gen-z-really-think-about-work/>

10. <https://www2.deloitte.com/global/en/pages/about-deloitte/articles/millennialsurvey.html>



VR Training Use Cases

Frequently asked question: Which types of training are best suited for VR? Our advice: **Look at your high-profile, high-impact programs.** Safety, sales, soft skills/leadership, and technical training often rise to the surface. Think about training that requires a high level of hands-on practice to achieve competency—or situations where you need to gain buy-in for a new product.

Safety Training

VR puts learners into an environment where their safety is at risk—safely. You can help them **identify risks or enable them to practice the correct physical response to safety risks and provide feedback based on body tracking.**

In a study comparing VR training to PowerPoint training for health and safety training, the VR group demonstrated stronger longer-term recall of the information. “The increased cognitive engagement of learning in the virtual environment creates more established and comprehensive mental models which can improve recall,” stated a report on Science Daily.¹¹

Teleport to Chapter 6

for a **case study on de-escalating aggressive behavior that uses body tracking.** ▶▶▶



11. <https://www.sciencedaily.com/releases/2019/09/190916212516.htm>

Gamified Safety Training for Garage Managers

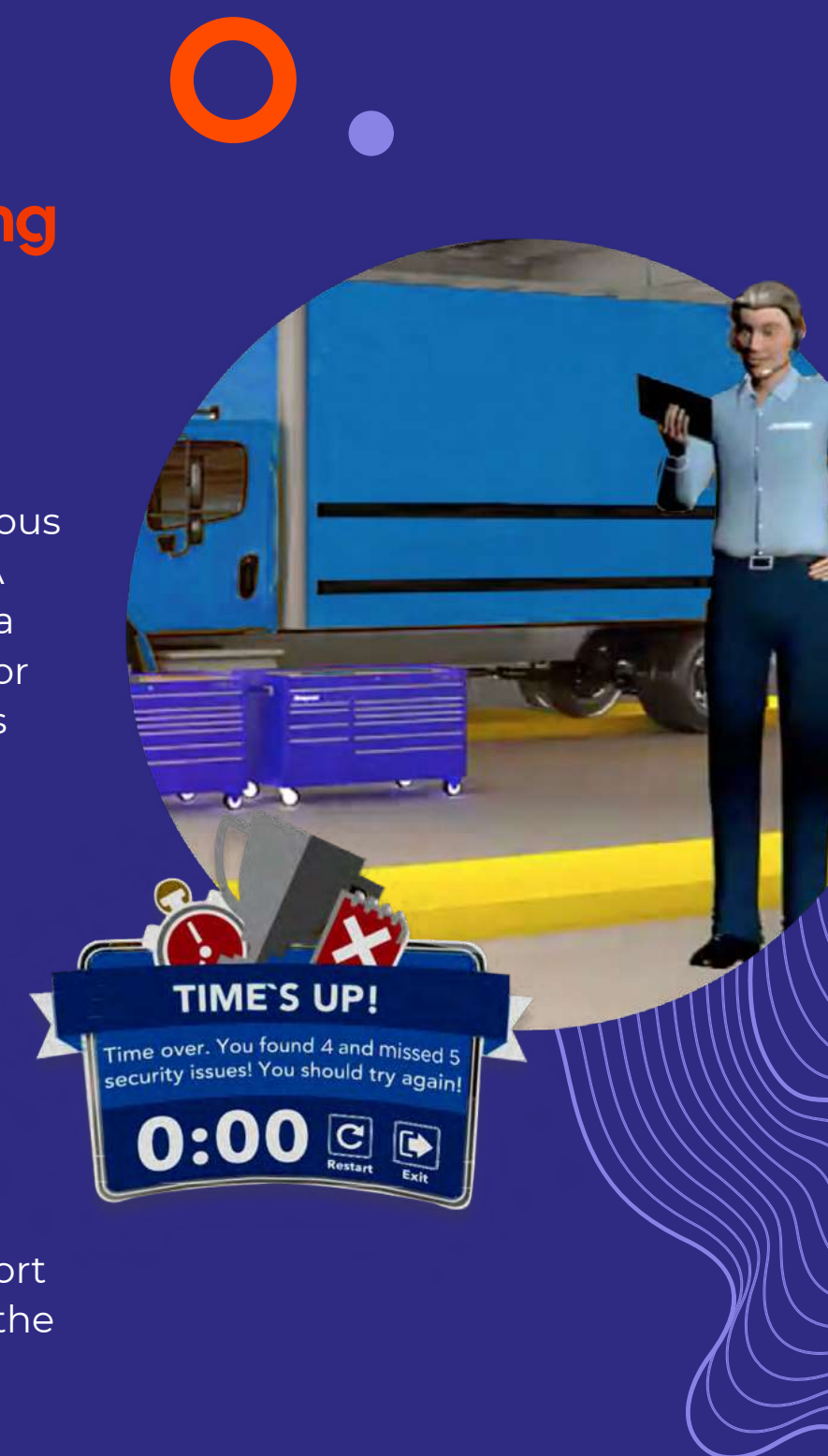
Garage managers need to be hyper-vigilant about safety—one piece of equipment out of place can mean serious harm to their mechanics and drivers. A national transportation company had a rigorous classroom training program for new managers, including a safety class in which learners “spot the dangers” in images projected on the screen. The stakes are high—and they knew there had to be a better way than letting learners slip on oil on the floor!

Together we created a detailed, CGI (computer-generated image, in 3D) replica of a garage, filled with safety risks. Learners put on the headset and enter this virtual world. They can teleport (move) around the space and click on the safety risks they see.



Here’s the next level: We gamified the experience. It’s a timed experience—racing against the clock simulates the level of urgency with safety risks. Learners earn points (time added to the clock) for spotting the dangers. More time is earned for correctly identifying the risks as low or high and/or recommending the best course of action.

Learners love this “break” in their intense classroom schedule and we’ve made the learning experience more effective. And it’s a great example of transforming face-to-face training to virtual.



Sales Training

Do your sellers rarely (or never) have an opportunity to experience the product they're selling? This is frequently the case for high-end products, such as luxury suites, and also applies to consumer products that can't be demoed in stores, such as tires. **VR can connect them to your product by enabling them to experience the product features, the perspective of the target buyer, and the emotions associated with product benefits.** That visceral experience stays with them as they sell your product to customers.

Soft Skills, Leadership, and Empathy Building

If you're looking to grow future-ready leaders, your training programs need to build critical thinking, communication, and decision-making skills.¹² Building empathy and understanding across roles and enabling cross-functional collaboration are essential to growth and innovation. We've talked earlier about the power of VR in helping learners deeply experience multiple perspectives—and how it overcomes the limitations of traditional learning techniques like role plays. VR can help you effectively transform face-to-face learning for these skills to virtual.

12. <https://www.forbes.com/sites/bernardmarr/2019/04/29/the-10-vital-skills-you-will-need-for-the-future-of-work/#45a04ce93f5b>

Product Launch for Extended-Enterprise Sales Associates

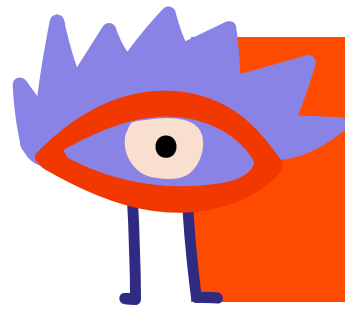
Car and truck technology does not necessarily evoke a memorable and emotional connection in sales associates. Traditionally, introduction to new products happens via a sales sheet—a static paper with a list of features, benefits, and target customer profile.

Working with a top player in the automotive space, we created a VR program for a new product launch that brings the technology and specs to life. Learners enter a virtual world: a vast expanse of road that's wet from recent rain. Three trucks come barreling toward them—will they stop in time? One will, showcasing the amazing stopping power of this truck!

Sellers have now experienced this critical feature in a way they never could by seeing it on a sales sheet. Once they catch their breath!

Technical Training

Of all the training types listed here, technical training tends to face the most organizational and logistical hurdles: hard to replicate, disruptive, and needs a safe environment to practice. **If you need to transform face-to-face technical training to virtual, VR should be high on your list of tools to consider.**



Teleport to Chapter 2

to learn more about **live-action 360**
video and CGI. ▶▶▶

Choosing Your Vendor-Partner Checklist:

L&D Experience

Now that you have a long list of training programs you're considering for VR, it's time to bring up the last piece of the puzzle for VR efficacy: your vendor-partner. As you evaluate your options, here's what you'll want to look for:



A learning philosophy that is not “one size fits all.”

If the company's focus is solely VR, then VR is what they will propose, no matter the need. (Yes, you've heard it... to a hammer everything is a nail!)



Deep experience producing custom, blended learning solutions. Learning is rarely a one-

learning solutions. Learning is rarely a one-dimensional event. What happens before and after? Your ideal vendor-partner will craft an effective learning journey for your audience.



Instructional designers who know how to design for VR learning. VR is an immersive experience—learners

VR learning. VR is an immersive experience—learners may be looking around, walking in a limited space, teleporting, manipulating objects, facing challenges, experiencing multiple perspectives, engaging in a story. Compared to eLearning and classroom training, it's a whole new world.



Chapter 2

The VR Investment:
Cost, ROI, and Gaining Buy-In

There's no need to sugarcoat the reality that VR is an investment. Like simulations and game-based learning, VR programs are typically at the higher end of complexity and interactivity—which translates to higher work effort to produce.

VR is still new—and changing—and there's a complex matrix of exciting possibilities for both producing VR (e.g., using live-action 360 video vs. CGI, which we discuss on page 23) and delivering VR (e.g., headsets, also known as “head-mounted displays” or HMDs). And that matrix changes as the technology evolves.

Navigating these options to arrive at the best solution for engagement, efficacy, budget, and timeline...as the saying goes, it's an art and a science. **It's also the essence of the cost and ROI equation for VR.**

In this chapter, we'll look at some key considerations for your bottom line: the state of the market and impact of COVID-19, key options you need to know that impact cost, shaping your ROI picture, and best practices for gaining buy-in.

The Enterprise VR Market and COVID-19

In the VR hardware market, the race is on to capture the “enterprise” space, which includes VR for corporate learning.

Top players Oculus from Meta, HP, HTC Vive, and Pico Interactive are finding their strategic lanes as they attempt to become the dominant player in enterprise and/or entertainment. That’s good news for L&D, as competition and commoditization continue to drive prices down.

Over the past two years, demand has increased for VR as an entertainment option; Oculus HMDs were frequently sold out in 2020,¹³ and several indicators point to high sales of the Quest 2 during the 2021 holiday season,¹⁴ Apple’s acquisition of NextVR signals increased investment in content¹⁵—an excellent sign for the industry. Greater adoption of VR as a household item is also good news for L&D, because greater saturation and exposure to the technology can help with leadership buy-in.



“

With competition in the market driving prices down, added to the reduction in business travel and increase in remote work, there’s reason to believe that VR will become an essential L&D tool. Just like phones and computers, every employee could be issued their own VR headset. Amortized over multiple learning programs, the investment can be far less than the travel costs alone.

—Adrian Soto,

Director of Immersive Tech, SweetRush SPARK

13. <https://venturebeat.com/2020/04/05/facebook-is-selling-refurbished-rift-cv1s-as-rift-s-remains-sold-out-in-u-s/amp/>

14. <https://www.forbes.com/sites/paultassi/2021/12/31/no-one-could-buy-a-ps5-or-xbox-series-x-this-christmas-so-they-bought-oculus-quest-2-vr-headsets/?sh=74d579204110>

15. <https://edition.cnn.com/2020/05/15/tech/apple-nextvr/index.html>





And specifically for L&D, there's reason to believe that VR will emerge from this moment stronger than ever.

Experts predict it will take two to five years for travel “to return to ‘some level we call normal.’”¹⁶ Some estimates indicate that

16
million U.S.
knowledge workers
shifted to working
remotely during the
crisis¹⁷—a jump from 4%
to 35% of Americans

and experts predict
that could continue,
with approximately

30%
of U.S. workers
working from home
multiple days per week.¹⁸

If you're an L&D professional, you know what this means for training—you've been living it for the past few months: **transformation of face-to-face training to virtual.** But short-term, rapid conversion, e.g., in-person workshops to webinars, will only go so far.

You'll need alternatives that provide higher engagement, targeted practice, and multiple perspectives to address learning objectives for your high-profile, high-impact training needs, and to ensure retention (especially when working from home) and recall. **You may also need ways for people to “come together” and learn in small groups, safely. That's where VR comes in.**

Key Options You Need to Know

Objectives, audience, environment, budget, timeline: Every learning need is unique. The most effective learning solutions are designed to address these specific drivers, preferences, and constraints. In other words, one size does not fit all.

That said, there are a few key options for VR that impact cost and drive decisions about hardware, which also impacts cost. Let's take a look at these.

16. <https://www.nytimes.com/2020/04/20/business/business-travel-coronavirus.html>

17. <https://slackhq.com/report-remote-work-during-coronavirus>

18. <https://www.vox.com/recode/2020/4/14/21211789/coronavirus-office-space-work-from-home-design-architecture-real-estate>



Visual Approach

Live-Action 360 Video



This approach uses footage and actors to create the VR experience. Special 360 camera rigs are able to capture all angles of whatever environment you need—an office space, a ship deck, a warehouse floor. With special software...and sometimes human assistance...images and videos are “stitched” together, so when learners are in the headset, they can look around and see the environment and people as they would in real life. User interface elements (e.g., instructions) can be overlaid on the video footage to add to the experience.

Live-action 360 video can be the correct solution for certain projects, but your investment can add up: complex environments or movement can create technically challenging filming situations; more scenes mean more stitching and editing costs; and the more actors, the more those fees increase. Also, interactivity and complexity can be limited. There are new cameras in the market that simplify this process; however, it comes at the cost of reducing the quality of the video or images.

vs.

Computer-Generated Imagery (CGI)



With this approach, a new environment is created, including everything the learner sees in the environment, using 3D modeling and rendering. Starting from high-quality images of real environments, designers create textures and materials so objects look as close to the real environment as possible. Learners can interact with objects: A phone will look 3D, and you can “pick up” the phone and use it to support the narrative or activity.

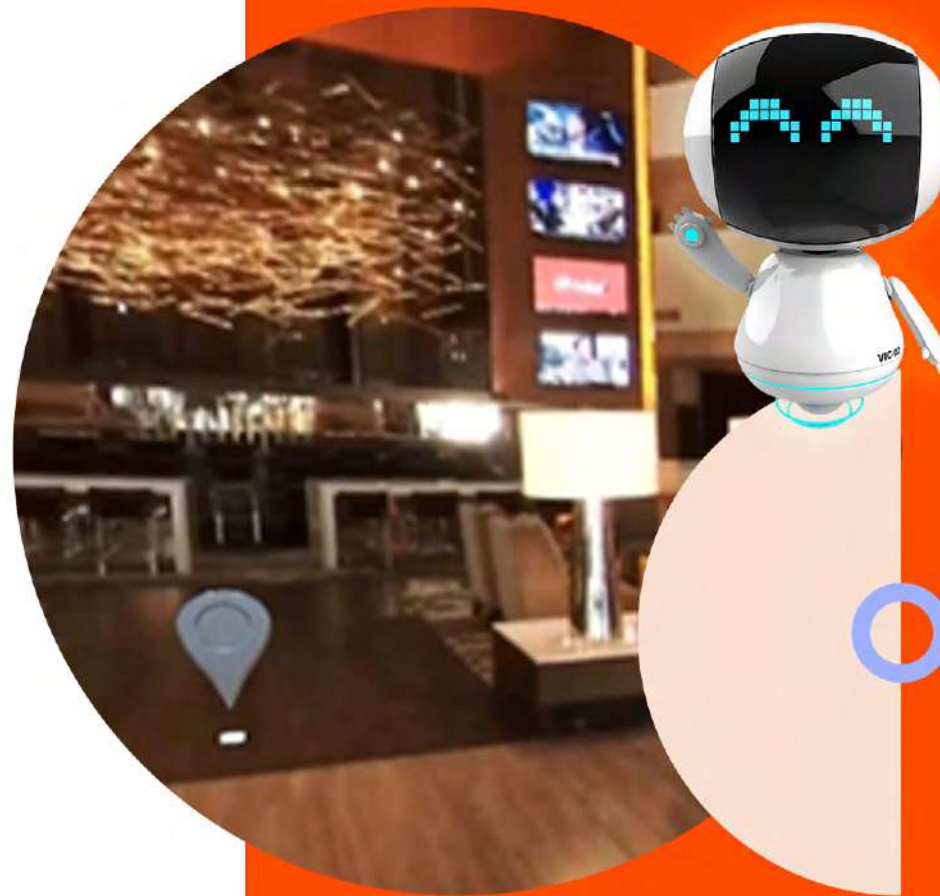
Compared to live-action 360 video, you can create more complex interactions using CGI. Instead of actors, avatars (CGI people) are created. Also, brand new environments/settings can be imagined, created, and executed with CGI. Greater level of detail for environments and avatars, more environments, and more objects will impact cost, and advanced CGI requires more powerful (and expensive) VR headsets; however not all applications require advanced graphics.

Live-Action 360 Video vs. CGI Advantages and Disadvantages

If you've ever considered these two paths for eLearning or simulations (live-action 360 video vs. CGI), you probably know the advantages and disadvantages of each. Live-action 360 video is more realistic, but if you need to make updates, reshoots are costly. CGI offers ultimate flexibility to create the virtual environment you want and is more easily updated, which has advantages for scalability, longevity, and amortizing your initial investment. But achieving higher levels of detail takes time.

You can have interactivity in both approaches, but there is more freedom to create a deeper level of a tactile learning experience with CGI.

Mixing Live-Action 360 Video and CGI



Here's where things get fun: VR is a virtual world that you create—the possibilities extend as far as your imagination can go. Your visual approach doesn't need to be an either-or, live-action 360 video or CGI. You can blend the two.

We did just that in the VR learning program described earlier, designed to build empathy for customers. Most of the VR “world” is live-action 360 footage in which the learner moves through the narrative in the customer's perspective.

They're seeing and experiencing customer service issues in different environments (a conference room, a restaurant)—all video footage shot with real actors.

The experience needed to be not just observational, but also interactive. So we added CGI elements: a 3D robot character that serves as guide and coach, and a 3D phone learners use to select their emotional response to the scenario and the best customer service response.

Both approaches blend seamlessly and intuitively in the VR world, offering a creative and engaging visual approach along with the right functionality to achieve the learning objectives.



Degrees of Freedom

Degrees of freedom (DoF) refers to the learner's freedom of sight and movement within the VR experience.

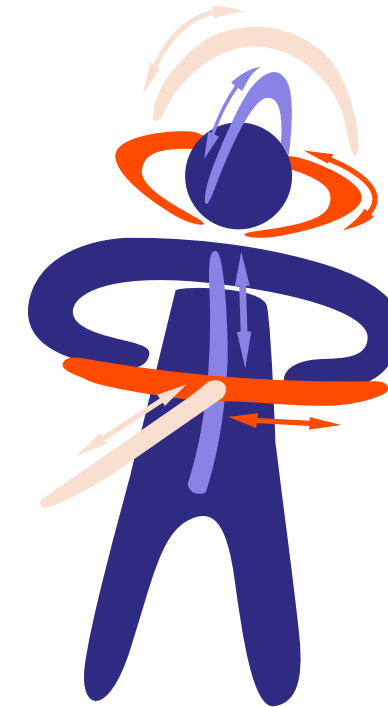
3DoF



3DoF enables learners to turn their heads in all directions: up, down, left, and right (rotational movement). They can look around within an environment: watch a video, ride a rollercoaster, be a virtual tourist in a foreign city. They can step inside and get a unique view of objects that might be impossible in the physical world, such as seeing the interior of an engine. They can interact with objects to some extent. 3DoF is a cost-effective option that can be a great solution to meet your learning objectives.

vs.

6DoF



6DoF tracks both rotation and position—so you have the freedom to look in all directions like 3DoF, and also to move around the experience, which can increase the feeling of immersion and presence.¹⁹ Interaction with objects can be more sophisticated, if required by the learning objectives. With 6DoF, you can train a person how to move, the speed of movement, where in a room to stand, proper arm position, how to display non-aggressive body posture, etc. 6DoF is more expensive than 3DoF given these additional features.

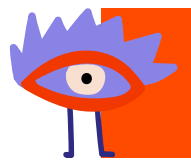
19. <https://trainingindustry.com/articles/learning-technologies/virtual-reality-for-learning-balancing-budgets-and-presence/>

Putting It All Together: Evaluating the ROI of VR

As you shape your ROI picture, you'll want to consider all of these aspects of cost and value:

1. The essence of VR—full immersion—aids retention and recall.

It accelerates performance improvement, offering a scalable, repeatable, consistent practice modality that can be tracked and assessed, helping you reduce costly mistakes. You can create a virtual, safe environment to practice skills when real-world situations are dangerous or hard to replicate.



Teleport to Chapter 1 to learn why VR is effective instructionally and as a unique learning tool.

2. When transforming a learning program with high travel costs, **a virtual, blended learning program including a VR component may reduce overall costs**, validating and more often than not, making up for the up-front investment.

3. **You won't use VR for every learning program; it will be part of your L&D portfolio.** Use it when it will be most effective, as you might appropriately use game-based learning, which also requires an up-front investment.



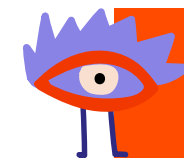
Teleport to Chapter 1 to learn the most effective use cases for VR.

4. **Hardware costs are an up-front investment that can also be amortized** over many learning programs. In the near future, a VR headset could be part of the standard equipment setup, especially for remote employees.

5. **The key options described previously (live-action 360 video vs. CGI, degrees of freedom) are forks in the road that will impact cost.** Your vendor-partner should help you navigate these options and arrive at the right solution that meets your needs.

6. **Work with your partner to evaluate the costs of deployment**, including equipment and labor costs for distribution and maintenance.

7. **Data is valuable.** Assess what data you will track both inside and outside of the headset, and tie it to performance objectives and your ROI equation.



Teleport to Chapter 3 to learn more about VR analytics.

8. **Don't underestimate the value of VR for talent acquisition.** VR technology speaks to younger generations and shows that you're not only providing learning opportunities, you're innovating.



How to Gain Buy-in for the VR Investment

We've followed several clients on their path to gaining leadership buy-in for VR. Here are some best practices we've learned from organizations in multiple industries.

Secure budget for a few headsets for key team members.

VR is a “see it to believe it” technology. If you're looking to pioneer VR at your organization, **you need to get key decision-makers in a headset.** This is a step that will go a long way toward gaining acceptance and buy-in.

Introduce VR as an L&D learning opportunity and get educated on the big picture.

VR is exciting—it's also new and can be confusing. The best way to start the process is to get educated. **Find a vendor that can provide you with a structured workshop on VR,** either in-person (when we can) or virtual. We hope this document serves as a good place for you, your team, and possibly your stakeholders to learn about VR. But you'll need to go deeper. Engage a vendor that can share the landscape of VR through an L&D lens.

This approach will serve you well, educate you on what you need to know, and help you get buy-in and make the right decisions moving forward. **You'll gain confidence in your knowledge and the chops of your vendor.** In our workshop, we collaborate and brainstorm use cases using design thinking activities and have found them to be remarkably effective for all participants.



“

I invited some clients up to my studio for a VR demo and my COO decided to come along. She had always been a little skeptical about my passion around this technology—until that day. I set her up with a few experiences, and after, she took off the headset, looked me in the eyes, and said, ‘I get it.’ I'll never forget her reaction.

—**John-Carlos Lozano,**
Chief Creative Officer, SweetRush





Start with the greatest opportunity for ROI.

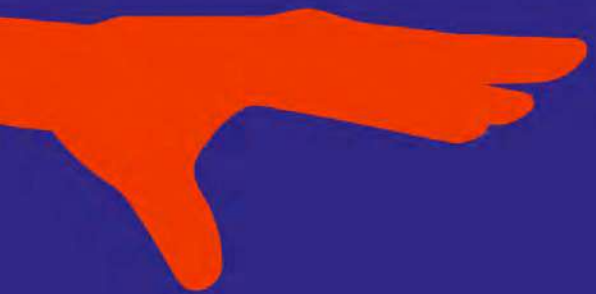
Create a list of your most costly learning programs that are in need of redesign and/or transformation to virtual, and have the most impact on your business. These are the programs in which VR can likely have the most bang for your buck. You may also look for partnership opportunities with sales and marketing—creating VR experiences that help sell or get buy-in for a new product.

Connect with IT early.

This is a technology-enabled learning solution, so rest assured IT will want to evaluate what you're doing. **Uncover IT concerns early—this information will help you navigate the options.** Rely on your vendor to engage in dialogue with your IT team.

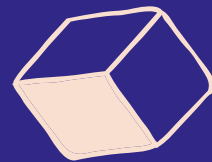
Secure budget for a proof of concept.

Work with your vendor-partner to identify a small part of the overall learning program that would be a good fit for VR. Design a proof of concept and organize a pilot. Share your findings and lessons learned with leadership.

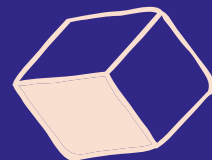


Choosing Your Vendor-Partner Checklist: Guiding You Through the Process ▶▶▶

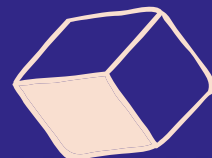
The cost, value, and ROI picture isn't complete without considering what value your VR vendor-partner will bring. Here's what you'll want to look for in a partner:



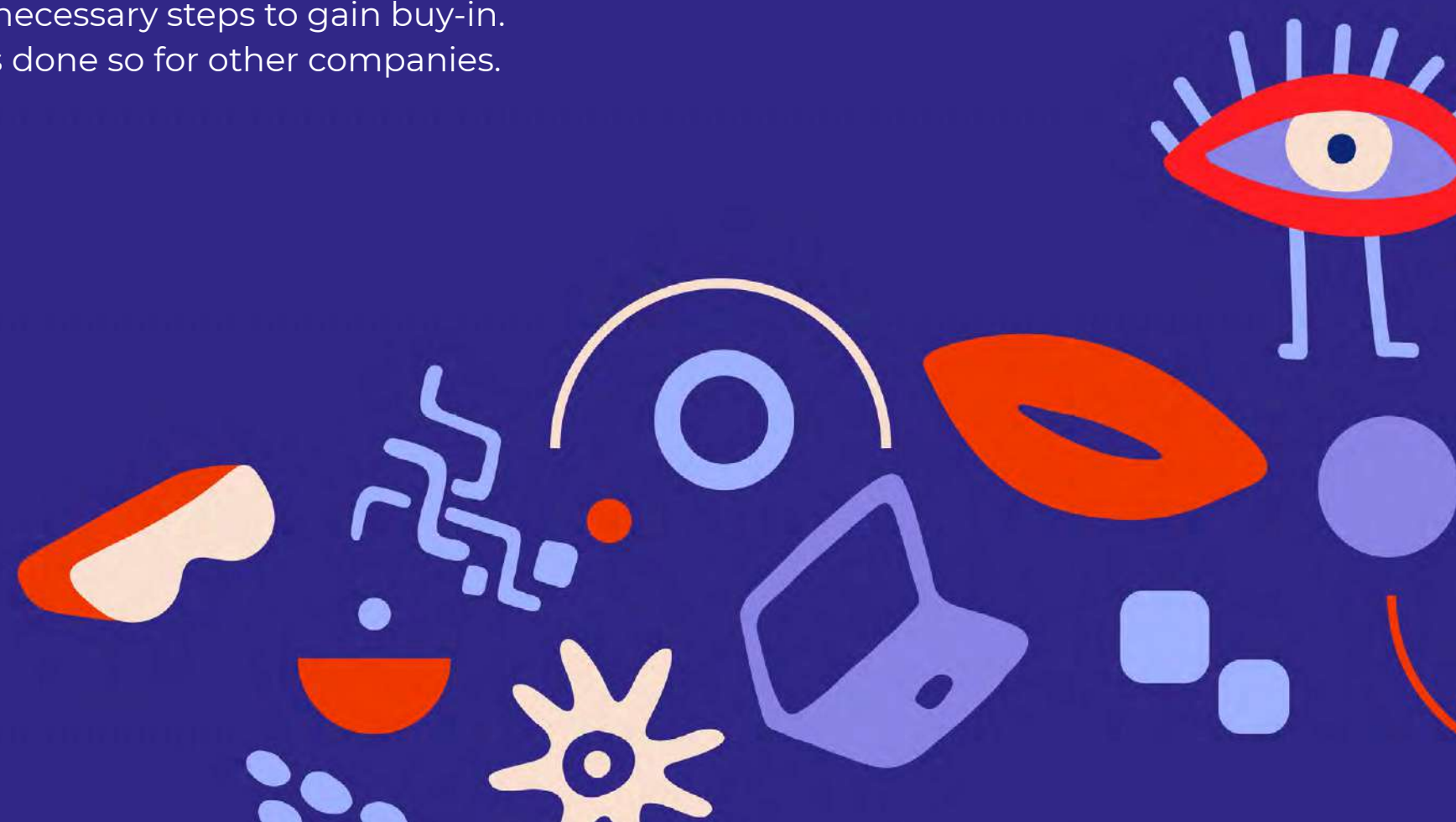
Respects your constraints and takes on your challenge as its own.



Helps you navigate the various options, simplifies the process, offers options that meet your needs—and not solely capable of one solution path.



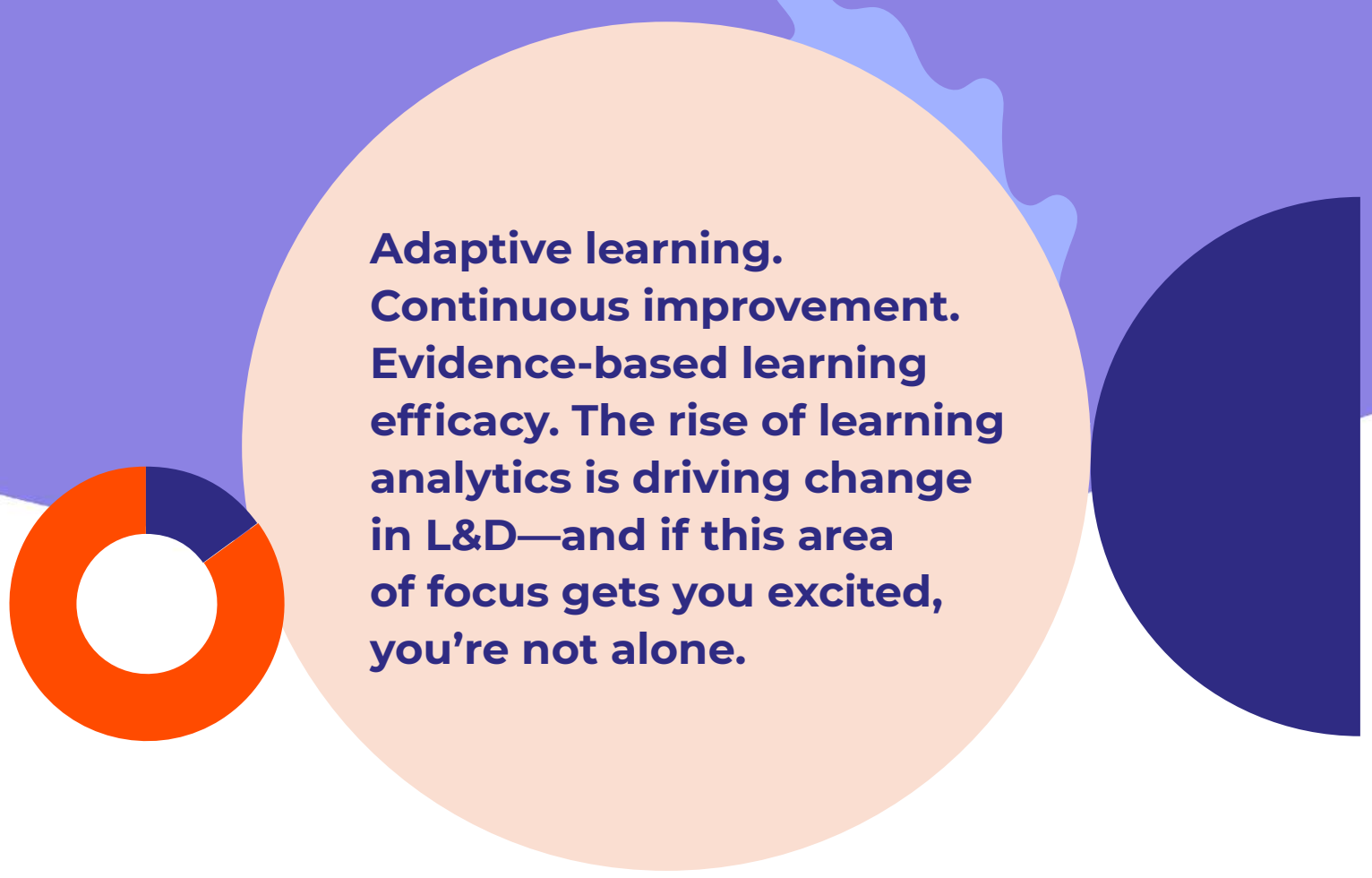
Supports you as you take the necessary steps to gain buy-in. Ask for examples of how it has done so for other companies.





Chapter 3

VR Learning Analytics: A New World of User Data Tied to Performance Outcomes



**Adaptive learning.
Continuous improvement.
Evidence-based learning
efficacy. The rise of learning
analytics is driving change
in L&D—and if this area
of focus gets you excited,
you're not alone.**

“Learning analytics” jumped from third to first position in Donald Taylor’s annual L&D Global Sentiment Survey, which asks, “What will be hot in workplace learning in 2020?”²⁰ Yet despite the drive to collect and use data to adapt, improve, and assess the value of learning, it’s been challenging for L&D to accomplish.

An annual report by Watershed suggests that

90%

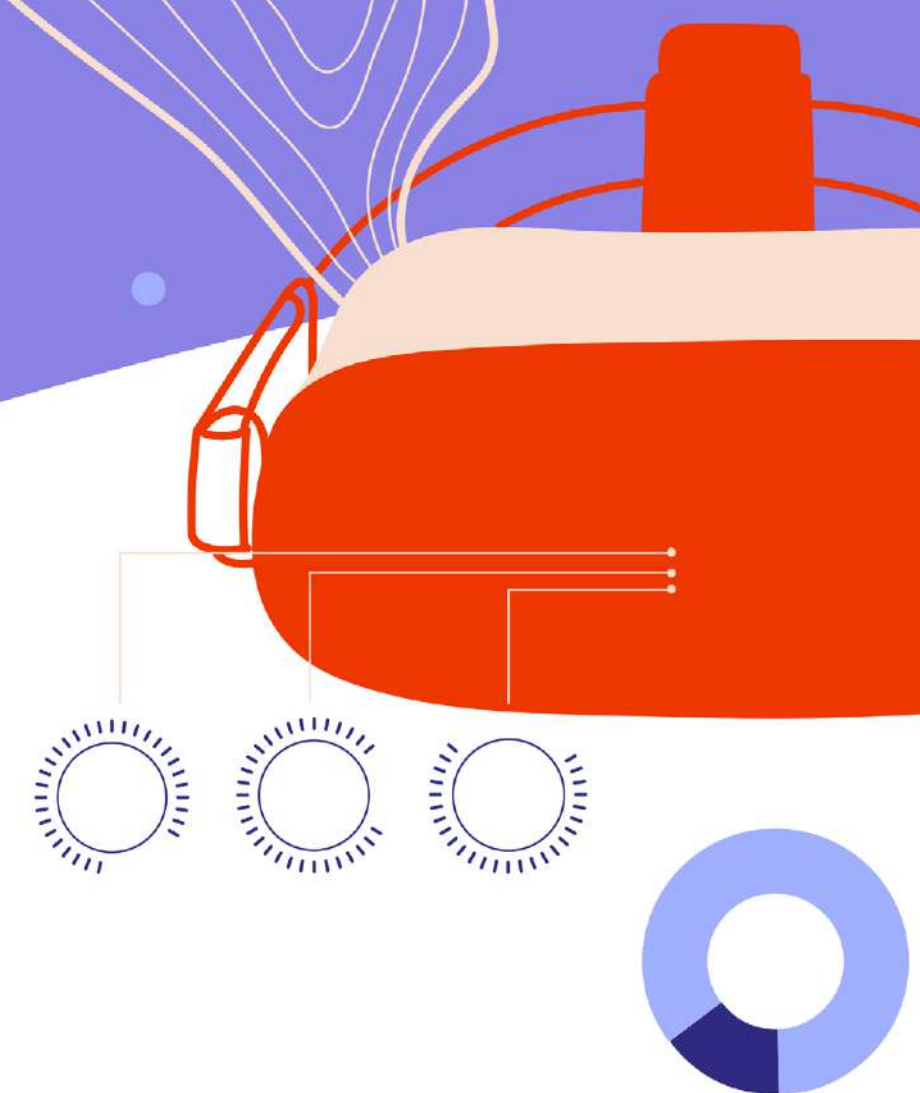
of L&D professionals surveyed want to measure the business impact of learning programs, and

53%

of L&D departments have either no or basic measurement.²¹

20. <https://donaldhtaylor.co.uk/insight/the-ld-global-sentiment-survey-2020-first-thoughts/>

21. <https://leolearning.com/resources/insight/measuring-business-impact-learning-2020-survey-results/>



VR brings unparalleled access to user data because of the innate tracking capabilities inside the headset, which can then be exported to an analytics tool or dashboard. Analysis of VR data can demonstrate training effectiveness and show areas of improvement, both on an individual level and aggregated across entire learning audiences. **Combined with a strategic approach to learning evaluation outside the headset, we have a powerful formula for tying data to performance outcomes.**

In this chapter, we’ll share some exciting developments in VR analytics, talk about the role of the LMS and the VR analytics dashboard, and consider an evaluation strategy that embraces data gathered inside and outside of the headset.

Many Ways to Use VR Data

This chapter focuses on learning analytics, but an important point to make is that VR user data is not only useful for analyzing after the fact. **With sophisticated VR programming, we can collect data during the learning experience and adapt the experience in real time.** New developments in VR include tracking body movements, facial expressions, voice recognition (speech) and, vocal tone, and even biofeedback, such as heart rate, eye tracking and, pupillometry.

Teleport to

Chapter 4 where we cover these
VR trends in more detail.



Chapter 6 to read a **case study**
where many of these new technologies
were applied.



What Can Be Tracked in VR?

Just this question gets us pumped because the answer was very different even a year ago. VR technology is advancing at a rapid rate, and analytics capabilities are keeping pace.

Let's take a look at what's possible to track in VR.

Progress, Completions, and Replays

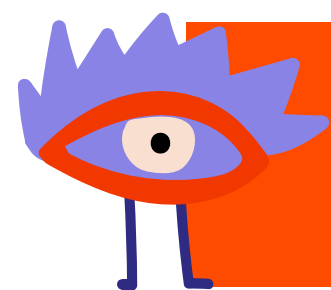
Measure and report on how many tries it took to finish a VR learning experience, and if/how many times the learner replayed the experience. This, combined with other data, can indicate whether you have areas for improvement in your learning experience.

Decision-making

Continuous monitoring of data means you can gather data on key decision points, which can include anything from multiple-choice assessments to choices in a branching scenario. Analyzing this data can help you determine if you've made the questions or scenario choices too challenging or not challenging enough. It could also help you analyze patterns in an individual's thought process or decision-making. With a branching scenario in which the paths are based on emotional response (empathetic, severe, professional), the data will show which path an employee tends to take.

Vocal Analysis

Track the verbal interactions learners have with avatars and interactive components within the VR experience to gauge the emotion and energy level demonstrated by a learner's verbal response. Pace can be determined by the words-per-minute spoken. Data can reveal the tone and overall sentiment of the speaker. You can even track how many "ums" or "likes" a person exhibits during verbal communication.



Teleport to Chapter 4

to learn how **vocal analysis** can be used in VR learning design.

Body Position and Movement

Evaluate this data to assess if the proper physical techniques being instructed are being achieved—ideal for safety training. For soft skills training, this data can be monitored to evaluate the learner's communication, interactions, and behavior exhibited through body language in the program. Monitor how and where learners move around a virtual environment to evaluate if you've created an intuitive path for them.



Teleport to Chapter 4

to learn how **body movement tracking** can be used in VR learning design.

Retinal Eye Tracking

Data showing where learners are looking in the VR experience (and at whom they're looking) can be visualized in a "heat map" for any point in the program. Evaluate this data to ensure key content is successfully being seen at the right moment in the learning journey. This data could also be used as key metrics for diversity and inclusion training, potentially indicating areas of unconscious bias.

Biometric Feedback

An exciting new development in VR, biometric feedback may include monitoring a learner's heart rate, energy expenditure, and even mapping brain activity (which is still in the early stages of development). This can provide insight into stress levels learners feel at specific moments in the program. You can measure learners' heart rates to determine if they're exerting a specific amount of energy at a particular time.



Teleport to Chapter 4



to learn how **biometric feedback can be used in VR learning design.**

Tracking of Multimodal Data

You needn't be limited by only VR learning data. Not only can your analytics tool monitor each VR program, you can also aggregate data from other learning modalities, such as augmented reality and mixed reality. This gives L&D the flexibility to implement different learning modalities (for optimal learning potential) while monitoring learning activities from a single, customizable dashboard.

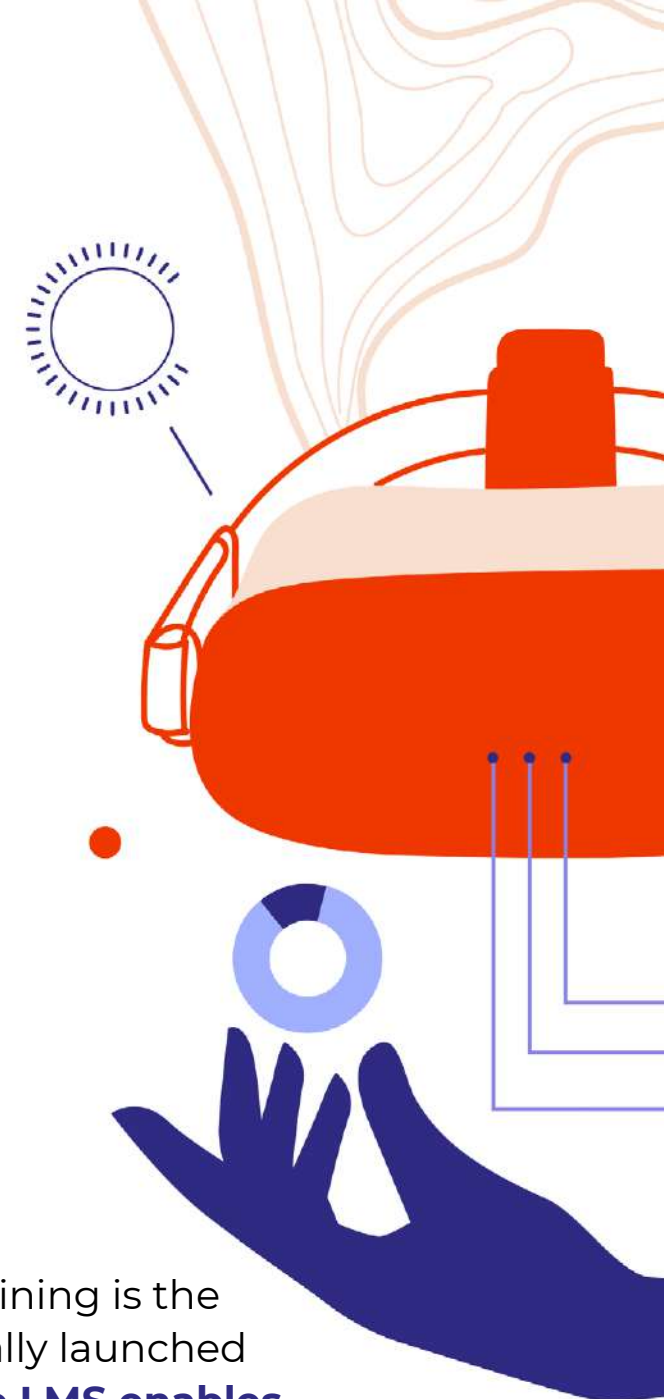
LMS vs. VR Analytics Dashboard

The traditional means for tracking virtual training is the Learning Management System (LMS). Typically launched from a web browser (desktop or mobile), **the LMS enables learners to enroll in classroom training (live or virtual) and launch eLearning courses.** They track enrollments, completion rates, and basic assessments.

Achieving the best integration with the LMS is a continuing journey in VR for learning. As self-contained, standalone applications, VR is typically launched via the VR hardware and software, rather than an LMS.

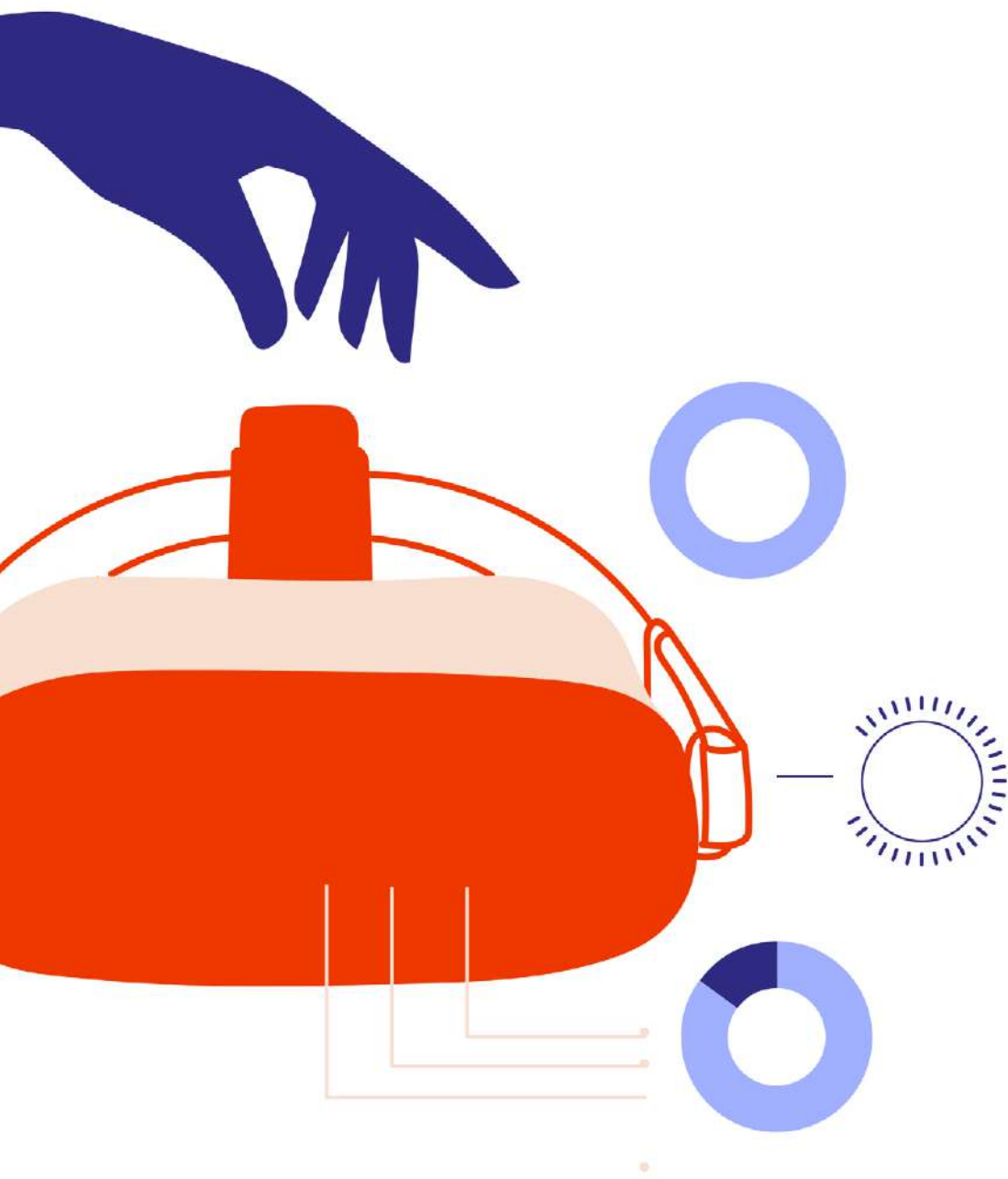
One option is to pass the user data collected by the headset to the LMS—or, as much as it can handle. At minimum, the LMS can receive completions and assessment data, and continue to be an organization's central repository for basic learning analytics.

However, if we want to go deeper and review and analyze more of the user data, then another tool will be needed: **Enter the VR analytics dashboard.**



The VR analytics dashboard can, at the very least, provide L&D professionals with these features:

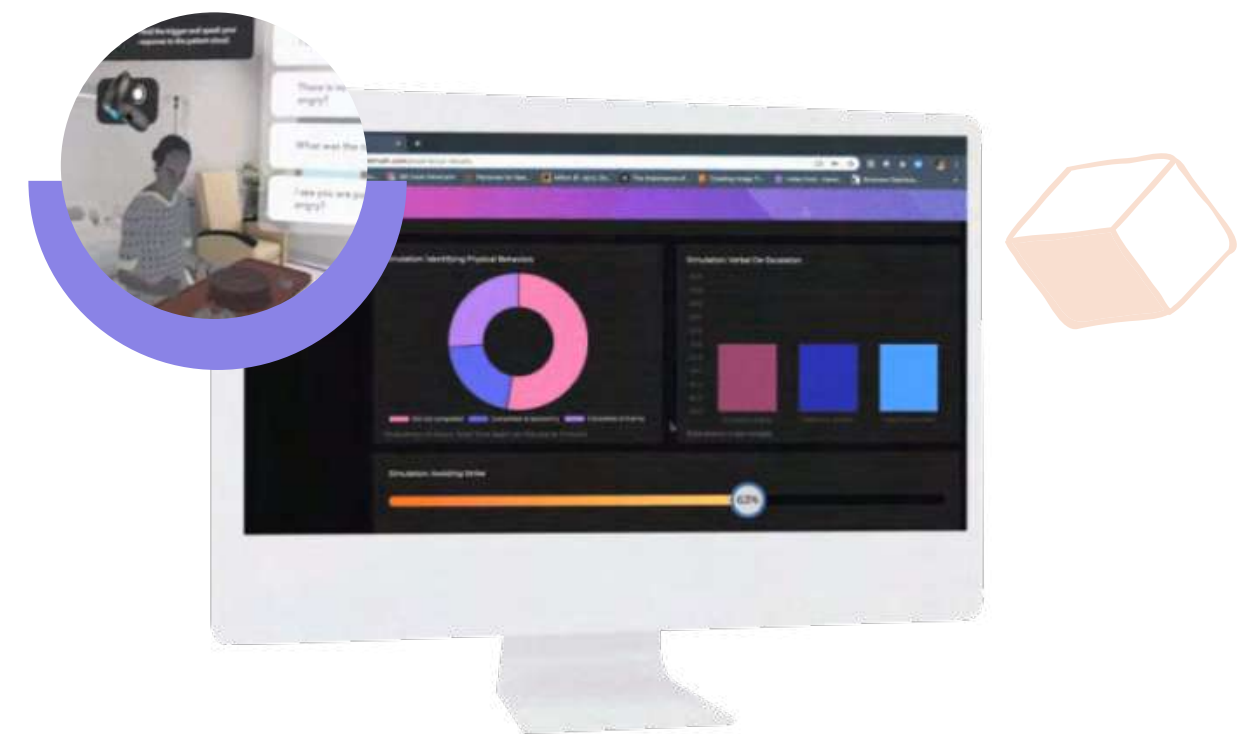
- › **Track users**, completion of experiences, and assessments.
- › **Track the amount of time spent on a given situation.**
- › **Count repetitions**, and/or interactions in the experience.
- › **Capture specific data** for each unique user.
- › **Support a dashboard view with a familiar LMS look**, feel, and functionality.
- › **Be customizable to provide insight into most important data:** You can add a data tracking element to pretty much anything in the virtual reality experience.



Measuring Impact Inside and Outside the Headset

To create the most effective evaluation strategy, you'll want to *combine* data captured from VR learning with data gathered after the learning experience. This evaluation strategy should be tailored to your learning objectives and audience, as well as business constraints.

If you're new to training evaluation, good places to start are the Kirkpatrick Model of training evaluation²² and Will Thalheimer's Learning-Transfer Evaluation Model (LTEM).²³



22. <https://www.kirkpatrickpartners.com/Our-Philosophy/The-Kirkpatrick-Model>

23. <https://www.worklearning.com/2018/02/14/the-learning-transfer-evaluation-model-ltem/>

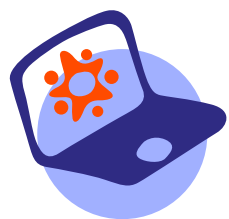
A comprehensive evaluation strategy might include **surveys, observation, and data analysis** to address the following areas (informed by the Kirkpatrick Model and LTEM):



Engagement: How do learners rate the level of engagement? This can be combined with user data captured inside the headset on progress and replays, and, in the near future, biometric feedback as well.



Confidence: How confident did they feel about performing the task(s) on the job before the training, and how do they feel after the training?



Relevance: How relevant did they find the training? How often do they predict they will use what they learned on the job?



Motivation: How motivated are they to apply what they learned back on the job?



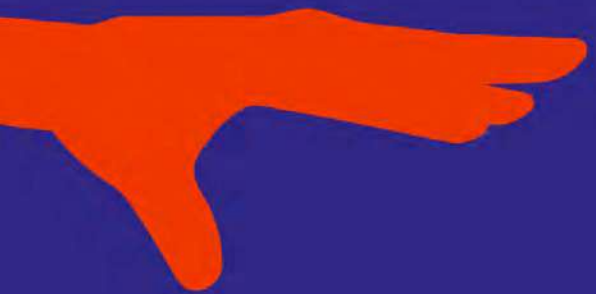
Knowledge: This refers specifically to the recall of facts and information, and is typically measured via multiple-choice assessments. This could be combined with user data on decision-making, for example with branching scenarios, captured inside the headset.



Competence/Transfer: Back on the job, is the learner making decisions and performing tasks by applying what he or she learned—in other words, displaying behavior change? This can be measured via manager observation and/or more sophisticated assessments (possibly in VR!).

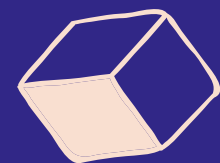


Results: What is the effect of the transfer on the business or organization? This typically requires more in-depth data analysis on key performance indicators before and after the learning intervention. Given the variables involved in these metrics (Is the increase in sales due to learning? New products? Discounts?), understanding impact at this level is challenging—the holy grail of learning analytics!

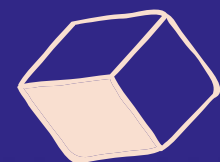


Choosing Your Vendor-Partner Checklist: Data Orientation ▶▶▶

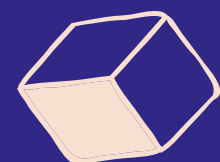
We hope we made clear in this chapter that for L&D professionals, the possibilities for the data analysis are just as exciting as what you see in the headset. As you evaluate potential vendor-partners, be looking for:



An orientation toward user data and learning analytics



Offerings or partnerships that bring you a VR analytics dashboard that helps you evaluate user data and tie it to performance objectives



Technology capability to capture data, for example biometric feedback and the growing list of what can be tracked





Chapter 4

VR Training Trends:
New Opportunities to Innovate



SWEETRUSH | SPARK

What sets VR apart from other L&D modalities, such as eLearning, is while we are creating VR programs for learning, there is simultaneously a whole industry advancing VR for media, entertainment, and gaming for profit. We're able to discover, adapt, and apply these advances in our L&D programs. **All it takes is finding (or building) the right tools to invent our way forward.**

Achieving success in VR requires constant experimentation and innovation—a dedication to and excitement for R&D.



In this chapter, we'll focus on some of the most promising new developments and trends in VR for learning—some we're already applying and some in the early stages of development that will be available in the near future. These include multi-learner experiences and instructor-led learning, facial and voice recognition, body tracking, and biometric feedback.

Multi-Learner Experiences and Instructor-Led Learning

Organizations are using VR for more than just training: collaboration, design, and virtual meetings are all happening in VR.

“Collaboration will be one of the biggest application areas for AR and VR. There’s a growing need to interact with one another—not only design in critical processes, but also just to be able to work together at any time and at any place.”²⁴

—**Salvatore Sorce**, research fellow at Brunel University London and expert in gesture recognition

The investment in collaboration technology by head-mounted display (HMD) manufacturers is good news for L&D, particularly as COVID-19 creates increased demand for innovative virtual training solutions.

Multi-learner experiences are a natural evolution of collaboration tools and virtual meetings. When you can’t be in the same room with someone, VR is the next best thing. Enabling two or more learners to meet in VR and learn together brings the experience of a group activity in a live classroom to the virtual world.

The possibilities for activities are limitless: Learners can work together to solve challenges, identify risks, and perform tasks. **These learners may be miles away in real life while working and learning together in real time—providing a version of human connection our distributed workforce is craving these days.**

Instructor-led VR learning helps us evolve from in-person training to virtual learning while providing instructors with at least the same level of control over the learning experience as they had in the classroom. **Instructors can “join” learners in the VR space, observe them performing tasks, and provide real-time guidance and feedback.**

With the next level of this technology, instructors can actually control the VR environment and trigger changes that learners will need to react and respond to! This is real-time adaptive learning—**instructors can observe how learners are performing in the learning environment and control how and what new challenges are introduced.**

24. <https://www.cisco.com/c/en/us/solutions/collaboration/virtual-reality.html>



Facial Recognition

How a person “looks” when they’re communicating with others tells a lot about their internal emotional state. Are they smiling when they interact with a customer? Does a business leader look uninterested when communicating a change strategy to his or her team? **These facial expressions demonstrate the level of interest, emotion, and empathy a person has when interacting in the real world.**

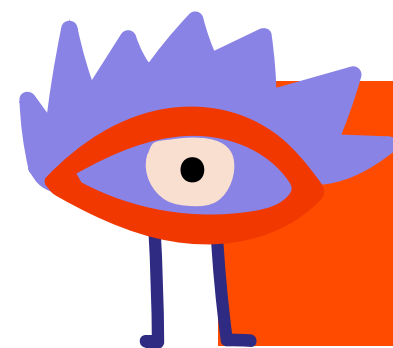
Another trend in early stages of development is facial recognition in VR. With this technology, we’ll be able to capture and use this data in real time within the learning experience. This could be as simple as providing feedback to the learner based on facial expressions, or as complex as triggering a specific reaction from an avatar or actor in the program, or an outside instructor who is observing.

This data can also be analyzed after the learning experience. L&D professionals can look for common responses in a learner population and determine if further training or reinforcement is needed for specific situations.

Voice Recognition and Analysis

Through built-in microphones in headsets, we can also capture data on speech and vocal tone. Again, this can be used in real time to provide feedback or trigger actions within the learning experience.

This technology was a key part of the solution in our VR program for health care workers on de-escalating aggressive behavior. As we learned from the subject matter experts, how you speak (your tone) is as important as what you say. Vocal tone is tracked and evaluated, and learners are provided with actionable feedback.



Teleport to Chapter 6 ▶▶▶
to read a **case study of a VR learning program using voice recognition and analysis.**





Biometric Feedback

An exciting evolution for VR is the potential for integration of biometric feedback. **Using Internet of Things (IoT) technology, programmers can connect the VR hardware with wearable devices, allowing them to send and receive data to enhance the learning experience.**

Which data depends entirely on what the wearable can track: heart rate, heart rate variability, resting heart rate, body temperature, blood pressure, VO2 max, steps, brain activity, etc. And in the near future it may all be tracked using the VR hardware. The LooxidVR system, which could be used in virtual-exposure therapy for treating PTSD, includes EEG brain wave sensors.²⁵

What does this mean for learning? Some examples: We can use the learner's heart rate to monitor how he or she is dealing with stress in certain situations. We can monitor the level of exertion a person requires to perform a certain task. This data could be presented to the learner in real time, as a constant visual (e.g., a number or visual meter), or as an alert when needed. **Presenting this data to learners helps them self-monitor their body's reaction to what they are experiencing or performing in the VR simulation.**

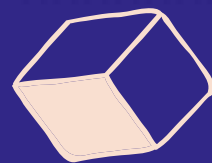
Biometric feedback has incredible potential for learning analytics as well. L&D professionals can review aggregate data about a learning population and identify ways to enhance the VR training (or other aspects of the blended learning program) and/or further training opportunities.

25. <https://www.rga.com/futurevision/pov/adding-biometrics-to-virtual-reality-to-gauge-how-you-re-really-feeling>

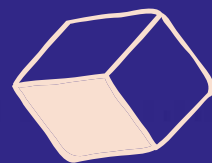


Choosing Your Vendor-Partner Checklist: **Track Record of Innovation**

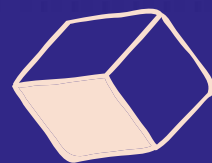
VR design and development is not about sticking to the status quo of even a year ago. It's about taking advantage of new technologies, inventing and innovating as needed to create the best, most effective learning solution you can. As you evaluate vendor-partners, consider these factors:



L&D experience and mindset. Your partner should always keep the learners, business driver, and learning objectives front of mind. Not applying new technologies for technology's sake, but rather applying them to the right use cases and broadening the scope of what's possible for VR training.



Approach to R&D and innovation. Your ideal partner will be committed to continuous research, building and adapting technology to bring new features and innovative use of data. And, it's very likely hardware and software changes will happen during your production cycle, so your vendor needs to be able to navigate and change with the times.



Partnership and line of communication with HMD manufacturers. Strong connections in this area help VR learning content developers know what changes and innovations may be coming on the hardware side.



Chapter 5

Choosing a Partner
for Your VR Learning Programs

Let's tackle the first burning question on your mind:
Do you even need a partner?

If you're at least somewhat familiar with eLearning authoring tools, you know there are many, many tools available out on the market to help you create eLearning. The easiest tools to use—that just about anybody with pretty good technical skills can pick up and get started with—are also the most limited in terms of their capabilities. If you're trying to accomplish something more complex and interactive, then typically you will need to get help from a developer.

The same is true(ish) for VR. The majority of the easy authoring tools are designed to work only with live-action 360 video and/or images in a fairly simplistic way. If you're interested in having a CGI environment and avatars, or incorporating more sophisticated features of VR that require more complex tools and talent, you will likely need the help of a vendor.

The greater the complexity and quality, and the more interaction you desire, the greater your need will be for more complicated tools that require more and more advanced programming skills.

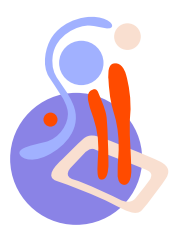
The VR design and development space, and the tools that support it, are not as mature as the eLearning space, and the pace of change is daunting.



This may sound self-serving, but we believe it to be true: Except for doing rudimentary development, you'll need a partner on this journey. In every project we've taken on, we've encountered problems and challenges that are technical, creative, and instructional. **At this point in the evolution of this modality, all these things demand highly skilled teams that have the expertise to work through the bumps that can (and do) arise.**

With that premise in mind, the rest of this chapter focuses on giving you a solid checklist to evaluate potential VR vendor-partners. Of course, we hope to make your short list, but in all cases, we want you to find the absolute best partner for you, that will set you up for successful VR learning.

Your VR Learning Partner Checklist



Instructional and Learning Experience Design

Blended learning capabilities

The efficacy of your VR learning experience depends on it being instructionally sound. Viewing learning as a one-time event (in other words: VR learning program, one and done) puts the success of your program at risk. Learning programs should be viewed holistically, addressing everything the learner needs to make the mental model shift and change behavior. This could include context, demonstration, practice, self-reflection, assessment, remediation, reinforcement, coaching, and performance support. VR can be the right tool for parts of your program, but it's not the full solution. The ability to design blended programs is an essential capability.

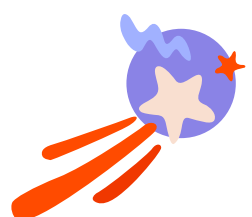
VR when it's the right solution

VR may not always be the right solution for your performance challenge—and your partner needs to tell you when it's not. When your custom content developer offers a wide array of learning modalities, it can guide you to the right solution. Partners that focus exclusively on VR will naturally gravitate to that tool, whether it's the best one or not.

Instructional design in VR

IDs who created classroom training needed to make a big leap to design interactive eLearning. The same leap is required for VR. **Immersive learning in VR is a unique learning modality that requires elevated skills in storytelling, interaction design, effective use of the 360-degree space and movement (if available), and learning game design (if appropriate).**





Creativity and Innovation

User interface and user experience

Just like the leap that IDs need to make, creative designers need elevated skills in UI and UX, now working in a 360-degree space. **Position and placement of instructions, controls, and other elements must be intuitive.** Often this is the first VR experience for learners; they need to be onboarded quickly and ready to go.

Engaging, interactive learning design

IDs and LXDs (learning experience designers) put words on a page and creative designers bring the story to life through visuals and interactive design. Review their work—do you feel guided through the story? Is it clear what you need to do next? Choose a partner that will go the extra mile—researching and replicating the trucks on your shop floor, creating new textures for the marble at your front desk. **These details enhance immersion and bring a "wow" factor to the experience.**

Understanding the options and overcoming challenges

Learners are immersed in visuals in VR. Getting the look right is essential, and there are choices to be made. How detailed should avatars be? **You may need to spend some time getting the details right—make sure your partner is willing to take that journey with you.**



“

Every day for 15 years, I've sought to change the way we present information to help people learn and change, and so we've led the charge in gamification, storytelling, animation, and so on. I cannot express how excited I am about VR, a fully immersive environment where learners can safely engage in hazardous activities or experience true empathy for one another. There is nothing quite like it, so we established our SPARK team and are beyond excited to be leading the VR journey with innovative clients.

—**John-Carlos Lozano**,
Chief Creative Officer, SweetRush





Project Management

Iterative design and development approach

Concept to execution is a step-by-step process. **You need to see how it's coming together as you go.** Understand your partner's approach to production and how you'll be involved and collaborate every step of the way.



“

One of the most exciting things about virtual reality is the incredible potential the technology has as a creation canvas, its immersive capabilities, and the fact that through different tools you can input and extract data that you can actually use for different purposes. It's the perfect playground for creators.

—Adrian Soto,
Director of Immersive Tech, SweetRush SPARK



Technology Innovation

Scalability

A major benefit of technology-enabled learning is scalability, **bringing a consistent, high-quality, effective learning experience to a wider audience and better leveraging your instructors/facilitators.** Your ideal partner will understand your scalability needs and constraints, and guide you to the right technology solution.

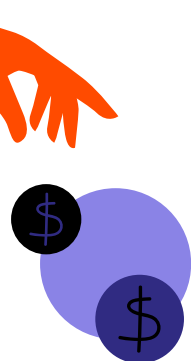
On-trend R&D

Your partner should demonstrate it's got the beat on trends in VR in media, entertainment, gaming, and learning. They should have a strong focus on research, experimentation, and innovation, applied to both internal projects and appropriate client use cases.

Addressing technology hurdles

Bumps in the road can and do happen. **The technology is new and evolving, and we are constantly pushing its capabilities.** Unexpected things come up. Does your partner have the mindset and capability to work through them? Ask for examples.





Respect for Your Investment

Reducing complexity

You're getting the sense there's a lot to this VR thing. There is. **But no need to get overwhelmed—your partner should help guide you to the best options for you.** Be wary of cookie-cutter solutions. You should see thought and care in what's presented to you.

A custom solution, tailored to your budget

A good partner will help you navigate the whole picture: content design and development, hardware, and distribution. **You'll need to see the complete picture with a solution that fits the investment level that's right for your organization.**



“

I've been an Instructional Designer for close to 25 years, and I've come to know that words don't teach...it's only experience that does. VR enables us to design real-life experiences that no other technical modality can offer AND in a completely safe environment. You get to move around and use your arms the way you would in real life. You can use voice activation, so the learner is saying the words out loud. I could go on and on. There simply is no substitute for experience, and VR offers that with complete safety inside an individualized experience.

—Holly Peterson,
Instructional Designer, SweetRush





Caring About Your Success

A guide through new territory

VR is new and exciting—and if you're new to VR, this is a new path for you. Your partner needs to step up and be a guide for you. **To see past where the state of technology is now to what's coming, and give you the best recommendations possible.**

Owning your challenge

Partnership means being on the same side of the table. It means understanding that as much as VR is an investment for your organization, it's a potential career boost for you—if it's successful. Choose a vendor that cares about your success and will do what it takes to make you a superstar.





Chapter 6

Putting It All Together:

Creating an Aggressive Behavior De-escalation
VR Program at CHRISTUS Health

Effective learning programs can make the difference between safety and harm, a topic of acute interest in health care settings. In our final chapter, we'll focus on a case study of a recently completed VR learning program that showcases many of the instructional and technological advances we've been talking about. It's a compelling and effective use case for learning critical workplace safety skills and changing behaviors to keep people safe.

Aggressive Behavior in Health Care Settings

Every day, health care workers face dangerous situations and aggressive behavior involving verbal and physical assault.

Of nearly 25,000
workplace assaults
reported annually,

75%
are in health care
facilities.²⁶

25%

of nurses report being
physically **assaulted by**
a patient or a patient's
family member.²⁷

Health care centers are uniquely vulnerable because they generally offer unrestricted public access in an often tense environment.

Texas-based nonprofit CHRISTUS Health (60 hospitals, 175 clinics and outpatient centers, 45,000 team members) sought to pioneer innovative approaches to address these very real concerns. Their health care workers and staff engage with patients, family members, and the public on a day-to-day basis, often facing challenging situations.

“

We are focused on providing the most relevant and realistic learning experience possible for our Associates. When they have great learning experiences, they have everything needed to create positive experiences and outcomes for our patients.

—**Tobias Washington,**
Director of Learning Experience, Creative Design,
and Talent Technology at CHRISTUS Health

26. <https://viewpoint.libertymutualgroup.com/article/workplace-violence-and-unique-exposures-in-the-healthcare-industry/>

27. <https://www.jointcommission.org/en/resources/patient-safety-topics/sentinel-event/sentinel-event-alert-newsletters/sentinel-event-alert-59-physical-and-verbal-violence-against-health-care-workers/>



Learning How to De-escalate Aggressive Behavior

Imagine that you are in this type of tense situation. Emotions run high when confronted by aggressive behavior, language, and actions. Your words, tone of voice, body language, and facial expressions can impact the way a person in stress will respond. How do you react?

How can you train someone to be in a dangerous situation without actually placing them in danger? You need a training solution that creates an emotional impact, induces empathy, and encourages a behavioral shift in how a person communicates and presents themselves.

CHRISTUS's "Zero Harm" efforts are focused on harm prevention and safety;²⁸ protecting its people and patients; and maintaining its core values of dignity, respect, and integrity.

28. <https://www.christushealth.org/st-vincent/about/investing-and-transforming-quality-of-care>

29. <https://www.tha.org/TexasHospitalsMagazine/MayJune2019/A-Safe-Place-to-Work-Re-tooling-Hospitals-to-Make-them-More-Secure>

To support this mission, the organization trains staff on de-escalating tense situations and aggressive behavior.²⁹ With its 600 centers and 45,000 team members, scalable training solutions are a must.

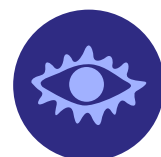
“

I am always thinking about how we can do a better job leveraging technology and making our training courses more valuable and more engaging for our associates who work so hard every day.

—Tori Coward,
Senior eLearning Developer, CHRISTUS Health



CHRISTUS's de-escalation training focuses on three core learning objectives:



Demonstrate ability to identify potential behaviors that could escalate into aggressive behaviors.



Demonstrate the verbal de-escalation process.



Demonstrate the physical response to protect oneself and others.

Transforming and Innovating the Learning Experience with VR

CHRISTUS wanted to maintain the quality of its existing in-person training, but take it to the next level of innovation, engagement, and efficacy. Its legacy program included role play in a classroom setting. While a safe environment, the classroom does not evoke the strong emotions (fear, frustration) that learners need to fully experience to effectively practice and prepare for real-life situations.

The traditional role play needed to escape the classroom setting and have learning take place in environments closer to the real world where situations tend to occur: an open reception area or a room in which a health care professional is alone with a patient. This would be costly, not easily scalable, and hard to replicate in real life.

The solution: a VR component for its learning program—a new virtual world created as a safe environment to learn, practice, and reflect.



Teleport to Chapter 1 ▶▶▶

to learn more about **Overcoming
Limitations of Role Plays**





“

When people think of hospital settings, they think of doctors and nurses and patients and everyone working together to do good, and this is what we are all about at CHRISTUS. But, unfortunately, there is also a great deal of stress and fear, and patients and their families are on edge, and more often than we'd like, people cross the line into aggressive behavior. How to mitigate and handle these situations is what keeps me energized and focused every day, and as the key stakeholder I am excited about using this immersive technology to help train our associates.

—Roy Alston,
VP, Security, CHRISTUS Health

Narrative and Scenario-Based Learning

In the CHRISTUS VR experience, learners are presented with scenarios, each primarily focusing on one of the three learning objectives. **The key was to make each narrative compelling and craft relevant scenarios.** This, combined with the sense of full immersion one experiences in VR, means that learners will feel fear, stress, and excitement, as they would in real-life situations, achieving CHRISTUS's goal of creating a more authentic and scalable learning experience compared to role plays in a classroom.

The scenarios featuring “Kenneth” and “Alice” bring this to life. As you approach Kenneth's door, you hear his shouting even from the hallway. It becomes louder when you enter the room, as Kenneth turns on you verbally and tears you down, along with your “uncaring” hospital that is “keeping him hostage.” In this scenario, you must use the verbal de-escalation process to defuse the situation and help Kenneth calm down from his verbal assault. (This scenario uses voice recognition, described on page 59.) Incorrect responses cause Kenneth's behavior to escalate. **This stressful environment is relevant and (unfortunately) authentic to the health care professional audience.**



Alice's situation has escalated beyond Kenneth's, and as you approach her room, she is yelling and throwing objects. You enter and she continues her angry monologue, now directed at you. The situation soon escalates and Alice is coming toward you, her behavior even more heightened. You must respond with physical movements to protect yourself and others. (This scenario uses body movement tracking, described on page 60.) As with Kenneth, act incorrectly and Alice's aggressive behavior increases.

Clearly these are extremely stressful situations, and a person's brain can interpret the VR experience as if it's the real world. The team worked to consciously balance authenticity and realism while not making the experience too scary or shocking.

UI/UX and Onboarding

For many learners, this experience will also be their first with virtual reality. **CHRISTUS wanted a VR program in which anyone putting on the headset could get started right away—a key challenge that required iteration to solve.** Care was taken to create an intuitive user experience throughout, with special attention given to the initial onboarding.

Learners first see a replica of the health ministry (hospital) in front of them, similar to a 3D floor plan, showing hallways and three rooms where the simulations occur. The onboarding is accomplished through voice-over prompts, providing an overview of how the program works and use of the controllers. **Learners are then able to teleport to the rooms. Audio and visual prompts lead learners through the rest of the experience.**

Taking a cue from VR games, rather than performing all onboarding and tests at the beginning, some onboarding happens at the moment it's needed. For example, before entering Kenneth's room, the learner does a quick test with the system for voice recognition.



“

Given that VR is still relatively new, you have to be careful not to overwhelm the learner during initial onboarding with the many ways they can use the controller. We want the whole experience to be easy to engage, and simple and yet effective in achieving the objectives.

—Emily Cooper
XR Producer

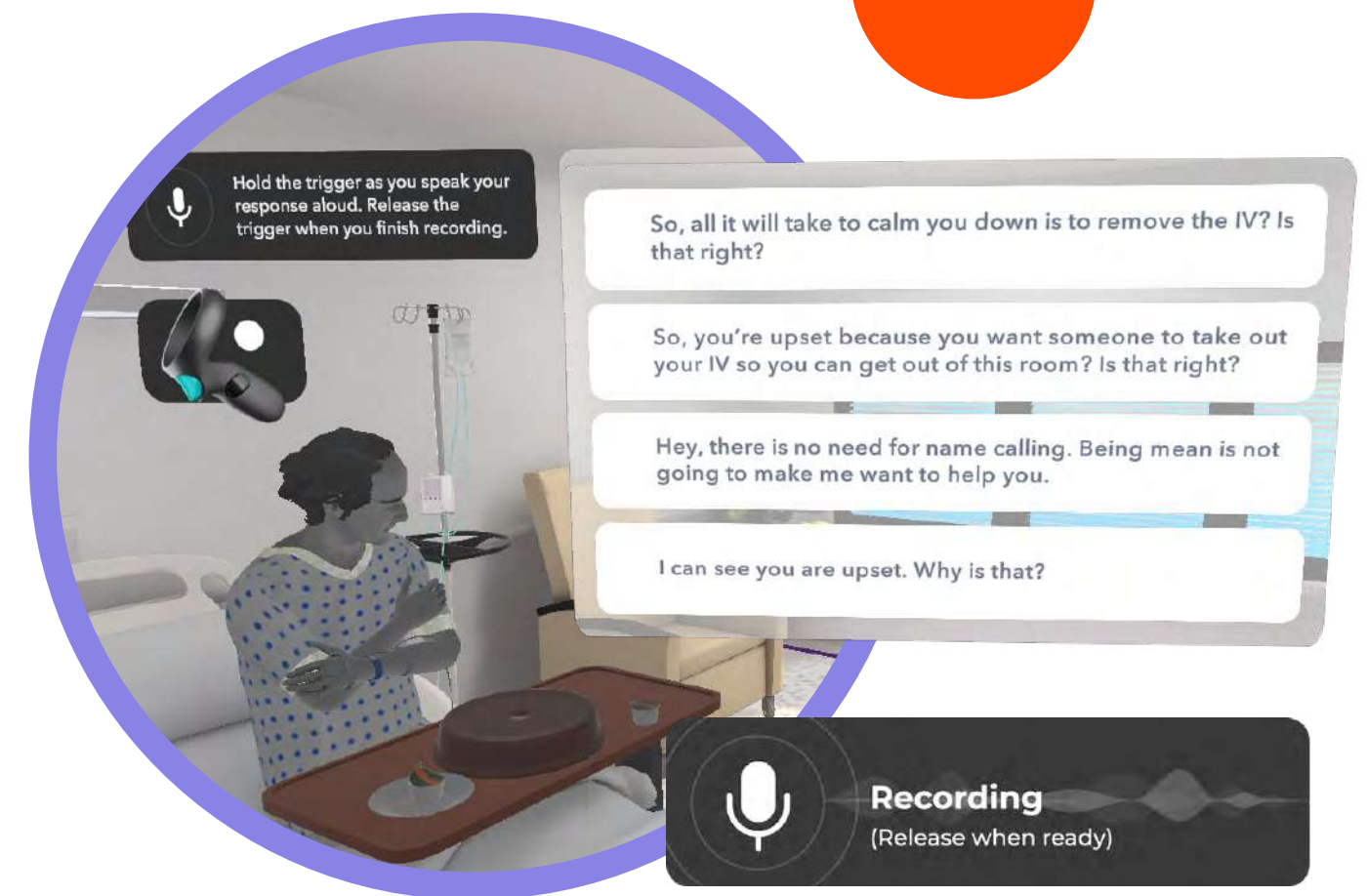
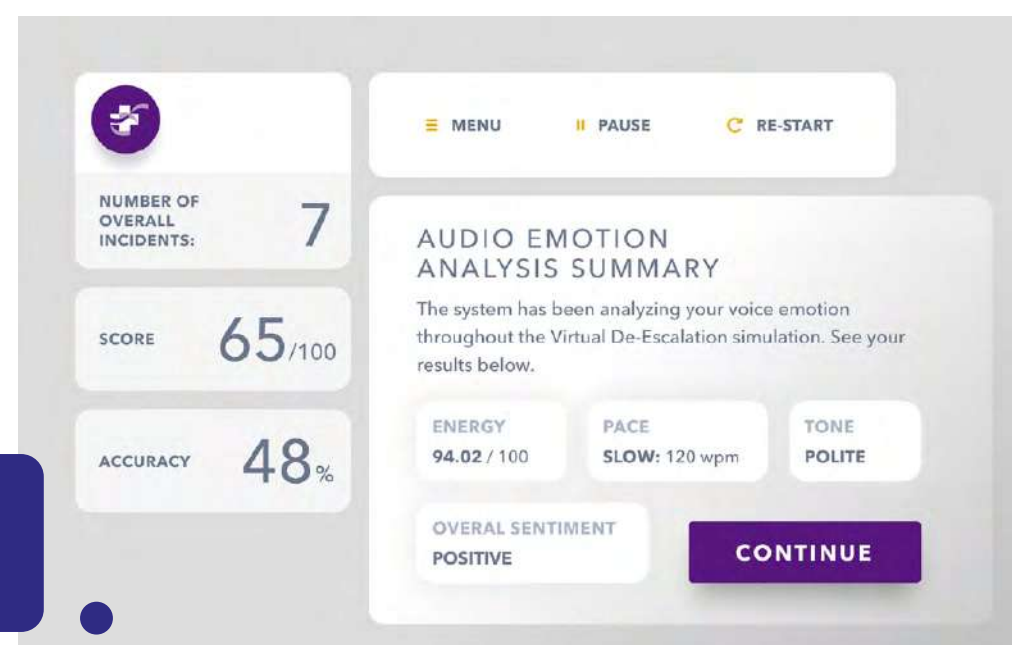
Similar to games, design of VR learning experiences requires “play testing” (user testing) and an iterative design process. **This direct feedback from learners helped the team find the sweet spot for instructions and onboarding—enough direction to move learners through the experience without it feeling overwhelming or clunky.**

Integration of Game-Based Learning

The learning objectives for this VR experience are all about practice—demonstrating the correct techniques for each situation faced. Similar to a challenge-based game, learners must demonstrate their knowledge of when and how to act with accuracy.

Seeing this parallel with games, the team integrated a scoring system that provides learners immediate feedback on their actions and accuracy, with points reflecting their performance. Points are awarded for each scenario and, depending on their score, learners will pass or fail the simulation.

At the end of the experience, learners receive an overall “incident count” score that ties to CHRISTUS Health’s “Zero Harm” efforts; learners must work to keep the incident count as low as possible. **Harnessing one of VR’s great benefits—repeatability—learners have the option to replay and perfect any of the simulations they failed, as well as those they passed with less than a perfect score.**



Voice Recognition and Analysis

In Kenneth’s scenario, learners practice the verbal de-escalation process. In more traditional eLearning, this could have been done by simply clicking on an appropriate response, but how you speak in these situations is critical. **The team incorporated voice recognition and emotion analysis technology in the simulation to create a more realistic practice scenario.**

Learners see a prompt of options to reply to Kenneth and speak their selection, while processing systems run in the background for voice recognition and analysis. **The program provides emotional analysis of the learner’s vocal energy, pace, tone, and overall sentiment.** This helps to gain insight on many levels—a base understanding of how learners’ overall tone comes across, their ability to actively listen, their empathy, and their understanding of the verbal de-escalation process.

Body Movement Tracking

In Alice's scenario, learners experience someone with aggressive physical behavior and must—literally—move to protect themselves. This includes postures and motions to avoid being struck. **Learners' body movements and position are tracked, and the program assesses whether they have responded appropriately and accurately to the situation.**

“

As an L&D professional, engaging a full-on emerging technology effort is as exciting as it is challenging. We knew we'd face hurdles and did, but we and our vendor partner had the fortitude and aptitude to deal with them, and the rewards are truly worth the effort.

—**Steven Villarreal**, Manager, Learning Experience Design and Technology, CHRISTUS Health



Navigating the VR Options

Computer-Generated Imagery (CGI) Environment and Avatars

After careful consideration, the team chose to use a visual approach of CGI environments and avatars. This avoided the difficulty of filming in a hospital situation, while offering more scalability for future maintenance and the ability to add new simulations. The ministry environment and avatars are realistic and also stylized in a way that keeps the focus on the learning. This avatar style, matched with its quality voice-over acting, allowed us to craft a world that was both immersive and engaging for the learner.

Choosing the Headset and Degrees of Freedom (DoF)

CHRISTUS wanted learners to practice the optimal physical response to help them avoid a confrontation or being struck. To support this learning outcome, **SweetRush and CHRISTUS made the decision to use headsets with 6DoF.** This option would allow them to monitor and assess learners' physical positioning and voice tone, as well as provide feedback, remediation, and replay until learners could demonstrate the techniques correctly.

Learning Analytics

The ability to track and assess data from the learning experience was a critical component for CHRISTUS.

We are tracking the following on an aggregate basis:

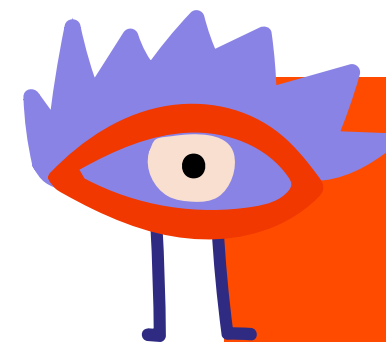
- › Activity (number of users)
- › Duration (time spent in the experience and average time to completion)
- › Visits per scene
- › Time per scene
- › Average score

Going deeper, **we are also tracking and can analyze the following on an individual level:**

- › Answers and score per scene
- › Audio emotion
- › Body movement tracking in the Alice scene



These “inside the headset” analytics, combined with data that CHRISTUS will collect “outside the headset,” create a comprehensive evaluation strategy for the learning program.



Teleport to Chapter 3 ▶▶▶

to learn more about **VR analytics.**

Overcoming Challenges

Challenges always arise in large, complex L&D projects. With new technology involved, complexity increases as new ground is broken. **Emerging technology demands a certain level of trust and mutual exploration. Both sides of the partnership—the vendor and the client—need to work, explore, and adapt together.**

Visual Approach and Level of Detail

An important and challenging decision for many VR experiences is the avatar style. Possibilities range from a cartoon-like approach to a very realistic, human-like approach. This latter end of the spectrum can be more costly and does not necessarily increase the level of instructional efficacy.



Avoiding the Uncanny Valley

In 1970, Masahiro Mori put forth the “uncanny valley” hypothesis, which in essence states that the more human-like we try to make the appearance of an object (e.g., an avatar), the more likely actual humans will feel uneasy and lack an affinity toward it.³⁰

The core focus for the team was creating an experience in which learners can focus on what they are learning and not be distracted by the environment or avatars. **After several iterations, a slightly stylized avatar was chosen, which we refer to as “abstract realism,” including human traits but no specific ethnic traits.**

Technical Hurdles

The sophistication of the program—multiple avatars interacting, the polished look of the environment—pushed the headset’s processor to the limit. The SweetRush SPARK team had to learn new techniques to create optimized 3D assets and materials, and more advanced ways to render real-time illumination. The team used performance analysis tools constantly to keep the experience as comfortable as possible for the user.

30. <https://spectrum.ieee.org/automaton/robotics/humanoids/the-uncanny-valley>

Integrating new technology, such as the body movement tracking, also took some extra care and innovation to get right.

Making sure the program recognized the correct body stance was essential. At one point, the SweetRush SPARK team created a special program in the VR application that was being tested by the subject matter experts (SMEs) to record their movements. That data was captured and sent to the team, which then made adjustments to the program based on the SMEs' recordings. This proved a fast and efficient way to overcome the challenge of ensuring the program provided accurate feedback on the body movements.

It's important to be realistic. VR is an emerging technology and every project is breaking new ground, so you and your vendor have to anticipate challenges will emerge.

A New, Innovative Safety Training Solution

Newly launched at CHRISTUS Health, this exciting learning component adds to its existing blended learning program for de-escalating aggressive behavior. **The organization now has a scalable and safe environment for health care workers to practice these critical skills.**



Your VR Training Journey Starts Now

Today VR is at the center of the proverbial perfect storm.

Let's consider all of the factors we've discussed: the prominence of remote work and virtual learning in our post-COVID world. L&D's constant drive to innovate and create more effective and scalable learning solutions. New generations of learners are demanding more interactive digital experiences. The investment in VR by big players: Apple, Meta, HP, HTC Vive, and Pico Interactive. The commoditization of hardware and the drive to secure the enterprise market, driving prices down and soon enabling organizations to provide individual headsets to their employees.

As we begin to define the "new normal" after the disruption of early 2020, **use cases for VR learning are growing, making this learning tool difficult to ignore.**

The benefits are significant:

- › Offering the highest levels of engagement and immersion in virtual learning
- › Bringing people in different locations into a common virtual space
- › Providing proven efficacy, demonstrating myriad ways VR can be used to address organizational learning needs
- › Leveraging advances in learning analytics, allowing L&D pros to tie user data to performance outcomes
- › Taking advantage of the rapid pace of innovation, expanding the possibilities for learning design and assessment



Conclusion: Your VR Training Journey Starts Now

As you embark on pioneering the use of VR training in your organization, one thing we hope we've made clear is that **it's essential to find a partner you can trust. A partner that can help you create effective learning programs that include VR, not just VR programs. And one that has the experience and attitude to tackle the complexities that come with embracing an emerging technology.**

From all of us at the SweetRush SPARK team, we invite you to reach out anytime to discuss your challenges with us.

**We'd be honored to show you
we can solve them together.**



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In Our Clients' Words: Immersive Learning Solutions

Amazing how SweetRush can quickly understand our business. Right from the start the SR team (yes I said team) worked with us to develop an exciting Virtual Reality experience. Their ability to wrench on the creativity nerve was amazing. SR's customer centric approach is second to none while flexibility and innovation exceeds expectations. **The result is a handsomely designed, impactful Virtual Reality solution. More projects to come.**

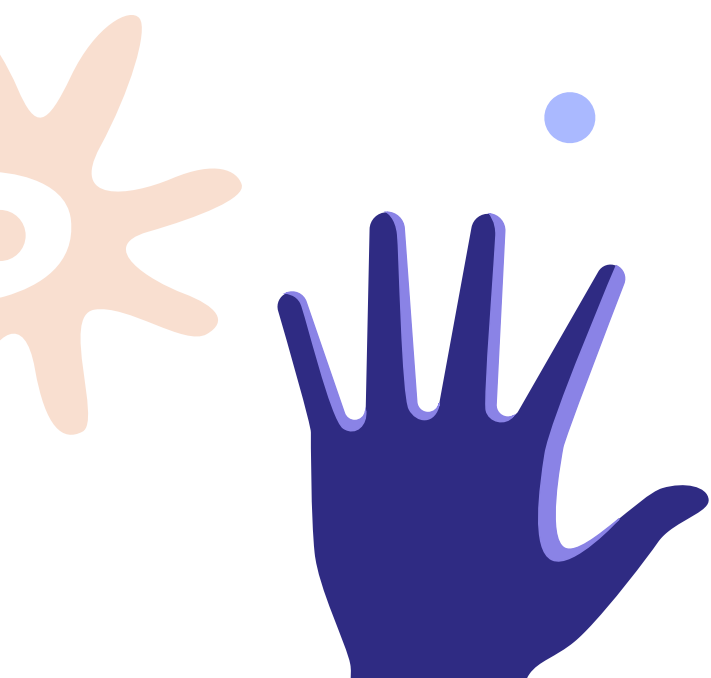
—Leading transportation and logistics company

They stay on top of the latest trends in their field, hire diverse talents, are very responsive to client needs/feedback, and they have the courage also to stand up for what they believe in. It was a true joy to work with them as we would go through the ups and downs of our projects with a 'glass half full' attitude, making sure it was fun to do the work at the same time as we were really focused on a high quality outcome. I would say I think Sweetrush are the best in their field!

—Fortunate 100 consumer goods manufacturer

SweetRush's creativity, knowledge of instructional design, and capable team of experts are what make them an industry leader. **Working with SR** has taught me about creating innovative learning and it has been an enjoyable experience working with their dynamic and supportive teams. SR are truly dedicated to understanding learners' needs which has made a lasting impression on our organization. SR has exceeded my expectations in all areas of service, instructional design and technical capacity.

—High-impact, global foundation





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Best Unique or Innovative Learning Program
Brandon Hall HCM Excellence Awards



GOLD
Best Use of Virtual Worlds
Brandon Hall HCM Excellence Awards



GOLD
Excellence in Technology Innovation
CLO Learning in Practice Awards

We'd be honored to show you
how effective the full-immersion
learning experience can be!



Adrian Soto
Director of Immersive Tech

CONTACT

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SPARK

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TALENT SOLUTIONS

Need temporary talent? We understand your needs and can quickly match you with the right L&D professional—because we do this work, too.



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