



2020 Immersive Learning Technology

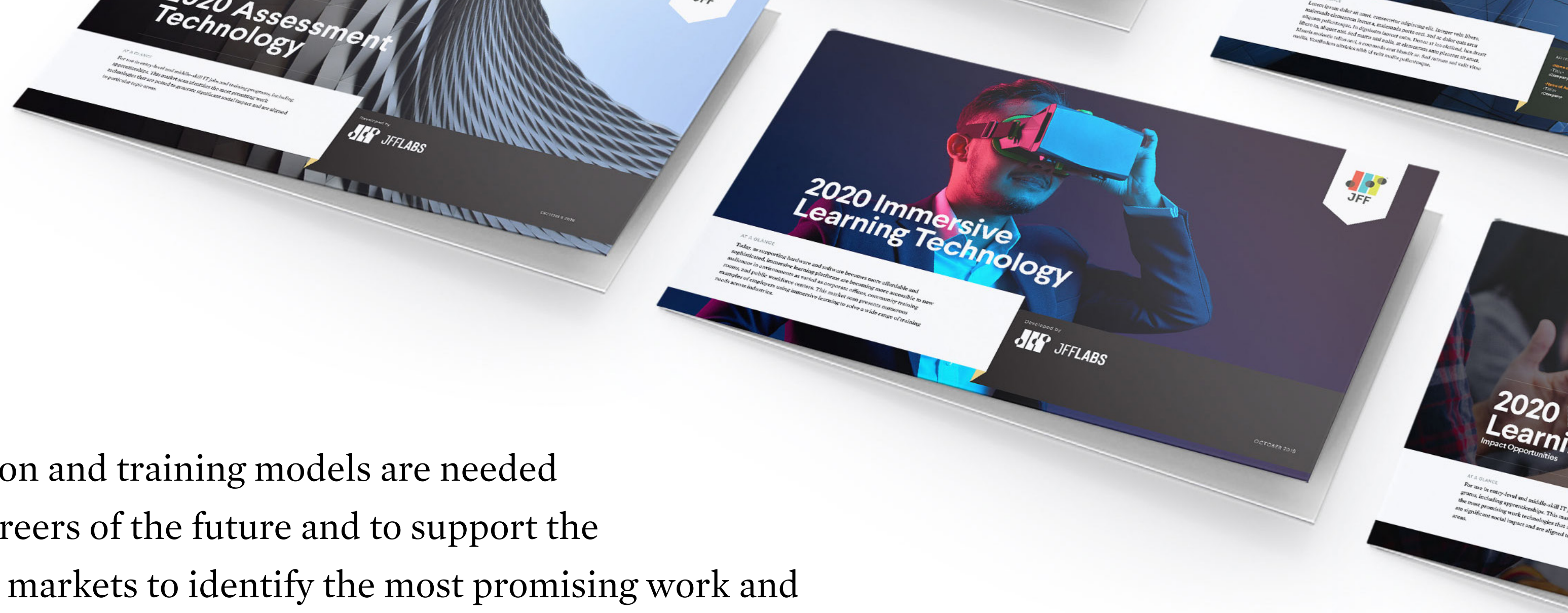
AT A GLANCE

Virtual and augmented reality technologies for use in frontline and middle-skill jobs and roles.

Developed by



JANUARY 2020



About Our Market Scans

The world of work is rapidly evolving. New education and training models are needed to prepare students and workers for the jobs and careers of the future and to support the talent needs of business today. At JFF Labs, we scan markets to identify the most promising work and education technologies that are poised to generate significant social impact and are aligned to particular topic areas, such as work-based learning, assessments, immersive learning, and others.

Who We Include

We work with entrepreneurs and growth-stage companies to accelerate and scale workforce and educational technology innovations. We feature mission-aligned companies and nonprofit organizations of all sizes, from seed-stage startups founded by inspiring innovators and entrepreneurs to growth-stage organizations already creating significant social impact and business value.

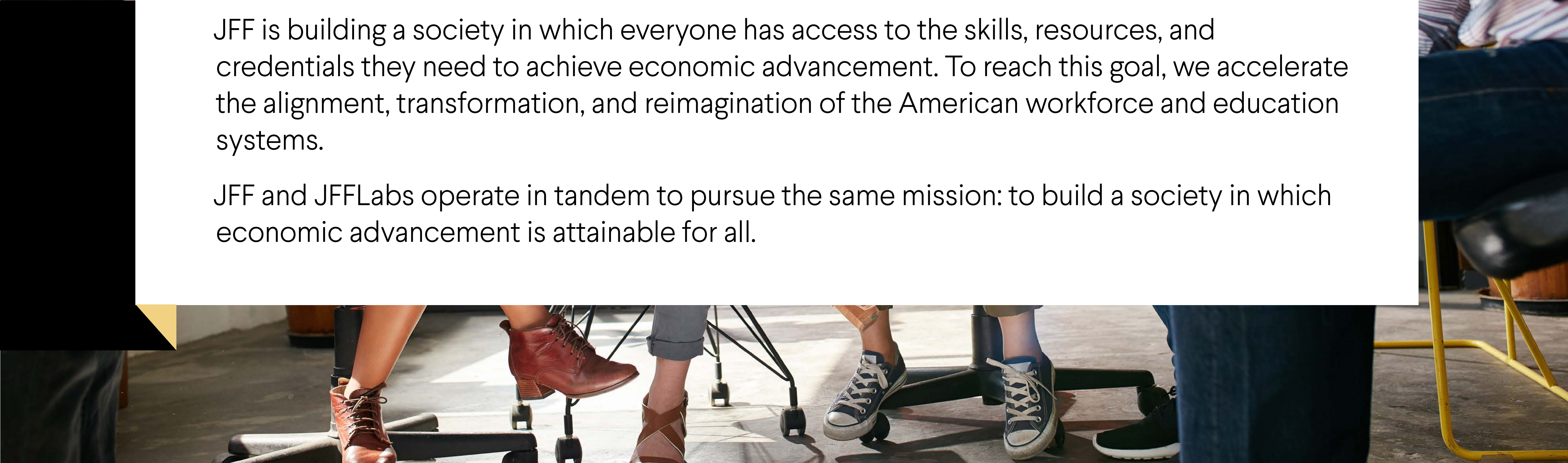
Who We Feature

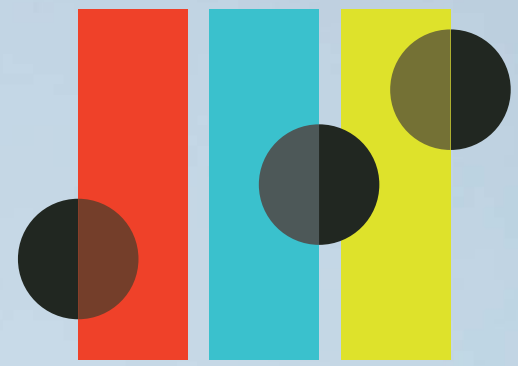
We selected 11 mission-aligned companies that represent trends, momentum—and volume, if you will—that create significant business aligned social impact. Each is a potentially transformative innovation, or being led by inspiring founders and teams that we believe in.



JFF is building a society in which everyone has access to the skills, resources, and credentials they need to achieve economic advancement. To reach this goal, we accelerate the alignment, transformation, and reimagination of the American workforce and education systems.

JFF and JFFLabs operate in tandem to pursue the same mission: to build a society in which economic advancement is attainable for all.



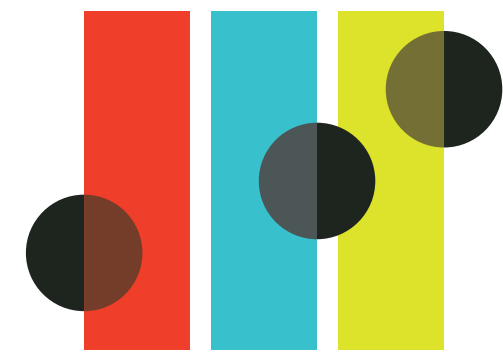


JFFLABS

Launched in 2018, JFF Labs bridges JFF's traditional field leadership with new relationships, innovation practices, and business models.

JFF Labs partners with visionary entrepreneurs, Fortune 500 companies, and investors to foster innovative solutions that create positive change in education and workforce systems. We provide a critical connection between traditional systems and new technology, financial models, and forward-leaning leaders.

We develop solutions and strategies that leverage our experiences building businesses, making investments, mobilizing technology, and working with corporate partners.



JFFLABS

ACCELERATION

Published by the JFF Labs Impact Accelerator

JFF Labs works with mission-aligned entrepreneurs and growth-stage companies to accelerate and scale technology-based solutions for impact.

In 2018, we established a new, nonprofit accelerator model to lead the field in identifying, selecting, and accelerating technologies to increase access to education and training.

Our custom, go-to-market acceleration program is designed to benefit partners, system stakeholders, and the people they serve. We work with companies with demonstrated product/market fit and have the ability to deliver meaningful social impact in tandem with the growth of their business.

Working across JFF and JFF Labs, our Impact Accelerator aligns social impact with the needs of business, education, and workforce systems.

The Impact Opportunity

When we talk about scale we don't mean serving, say, 500 people. To us, scaling means acknowledging the full scope of an issue and not settling for fractional progress. With our work, we're looking to have an impact on hundreds of thousands—if not millions—of people.

At JFFLabs, we create social impact for workers, learners, businesses, and traditional systems. We partner with companies that have established product/market fit and demonstrate the ability to deliver meaningful social impact in tandem with business value. Our impact priorities are:

- Good jobs and careers
- Education and training
- Equity and inclusiveness
- Advancement and economic security





“Immersive Learning is becoming one of the hottest and most transformational approaches to learning in business. New tools for VR and AR are transforming technical, managerial, and all elements of soft skills training because they create real-world learning experiences that stick. As this report describes, Immersive Learning is built on decades of experience in technology-based training, and it is now one of the fastest growing segments of the \$200Billion+ corporate training industry.”

**– Josh Bersin,
Global Industry Analyst**

How We Select Companies

We begin our process with data—lots of data.

For this market scan, we reviewed more than 300 companies of all sizes and stages, evaluating each for its alignment with our impact potential framework. Next, we narrowed the field and conducted numerous interviews and deep dives into the companies.

Finally, we argued. Who should be included? Who is not quite the right fit? Who is not quite the right fit? We asked the hard and honest questions that brought us to the companies we feature in this scan.



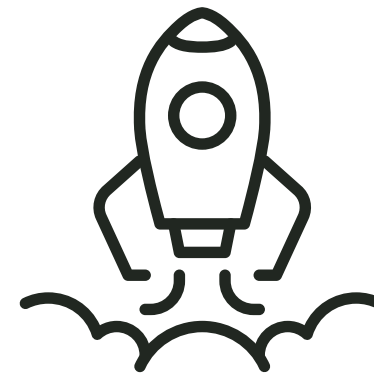
Scan

Audit // Discover
Examine // Explore // Review
Scour // Search
Study // Survey



Deep Dives

Analyze
Assess // Evaluate
Interview // Learn // Understand



Select

Invite // Organize
Publish // Vet

A Note on What is Not Included

Innovators from around the world are creating immersive learning solutions for all industries and verticals.

As recent advances in the technology have made immersive learning more practical and accessible, there has been rapid proliferation of quality applications across a wide spectrum of education and work-based learning use cases.

For this scan, we focused primarily on innovations appropriate for training aligned to frontline applications, including retail and related industries, distribution and logistics, and similar entry-level to middle-skill jobs and roles. In general, we did not include solutions developed for roles requiring advanced degrees, such as surgeons, architects, or engineers.

Why Immersive Learning?

Technology is rapidly changing how we learn and grow. More and more, tools and platforms that make use of virtual reality (VR), augmented reality (AR), and extended reality (ER)—collectively known as immersive learning technology—are moving from the niche world of Silicon Valley into retail stores, warehouses, factory floors, classrooms as well as corporate education and training programs.

The value is clear: these immersive learning tools help companies, training providers, and educators train workers better, faster, and more efficiently. Of course, the impact doesn't stop at the bottom line. Immersive learning presents an opportunity to reliably train employees for situations that are expensive to support, challenging to replicate, and even dangerous. And it can be done efficiently, safely, and with better learning outcomes.

Statistics

1 in every 3 small and mid-size businesses in the U.S. is expected to be piloting a VR employee training program by 2021, seeing their new hires reach full productivity 50% faster as a result.¹

The worldwide AR and VR market size is forecast to **grow nearly 7.7 times** between 2018 and 2022.²

14 million AR and VR devices are expected to be sold in 2019.³

TRANSFORMING Enterprise Learning

For decades, it's been anticipated that immersive learning technologies would transform training and education. However, until just recently, the systems were clunky, expensive, and offered mixed learning outcomes—especially for frontline and middle-skill workers.

Today, as supporting hardware and software becomes more affordable and sophisticated, immersive learning platforms are becoming more accessible to new audiences in environments as varied as corporate offices, community training rooms, and public workforce centers. Perhaps no other sector is seeing more rapid adoption than the enterprise learning space.



Employers are using immersive learning to solve a wide range of training needs across industries. These industries range from retail and hospitality to advanced manufacturing, defense, law enforcement, the skilled trades, and health care.

Our market scan presents numerous examples, including Talespin's deployment of leadership and soft skills training with Farmers Insurance, to Strivr's training modules that are used to support Walmart employees as they prepare for the mad rush of Black Friday holiday sales.

Across all industries, quality immersive learning solutions often yield better results compared with traditional approaches.

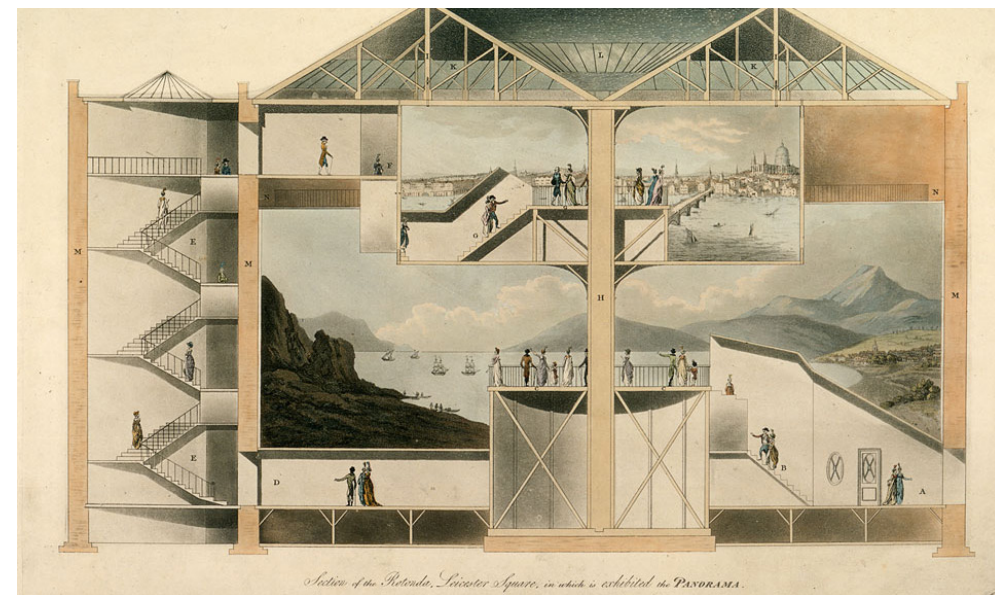


Explosive Growth

By 2023, enterprise VR hardware and software revenue is expected to jump 587% to \$5.5 billion, up from an estimated \$800 million in 2018.⁴

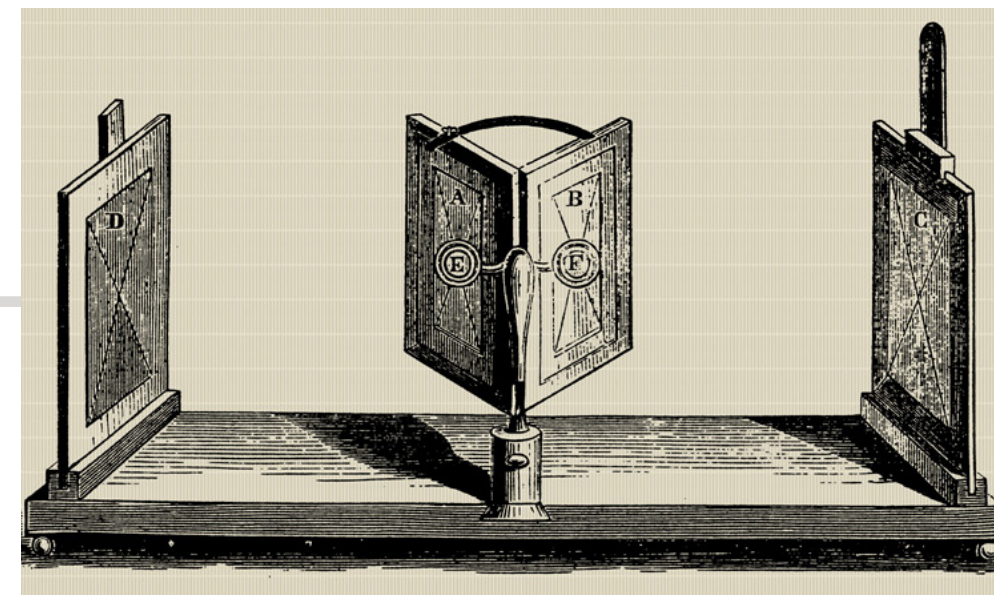
A Brief History of Immersive Technologies

For centuries, inventors, futurists, and technologists have created innovative ways for people to experience the world.



1787
Robert Barker's Panorama

A new way of experiencing painting, the panorama changed how the public experienced landscape images.⁵



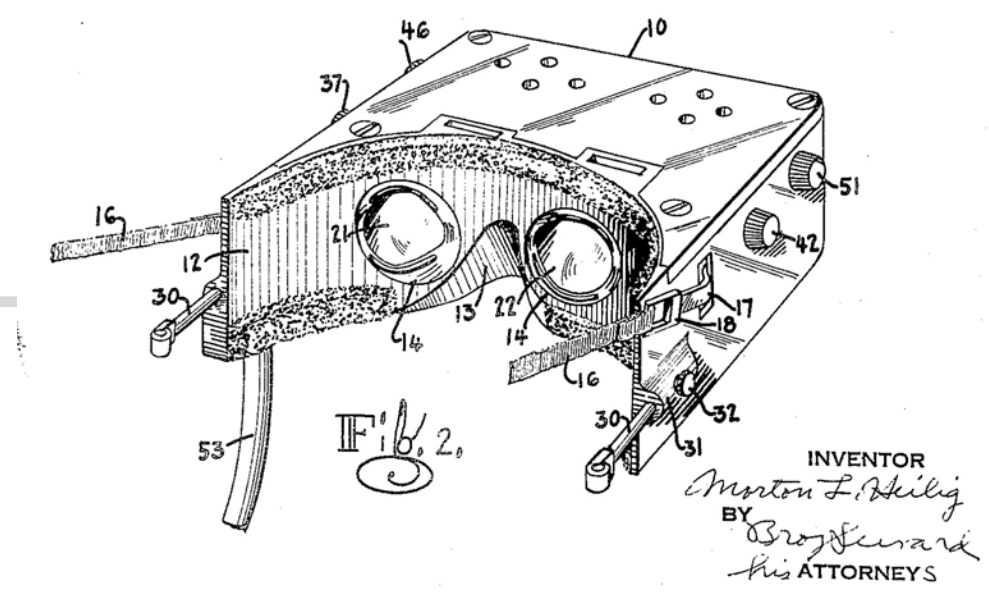
1838
Stereoscopic Photography

Stereoscopic images ushered in an era of "virtual tourism" and a new way of experiencing the photographic image.⁶



1929
Link Trainer Flight Simulator

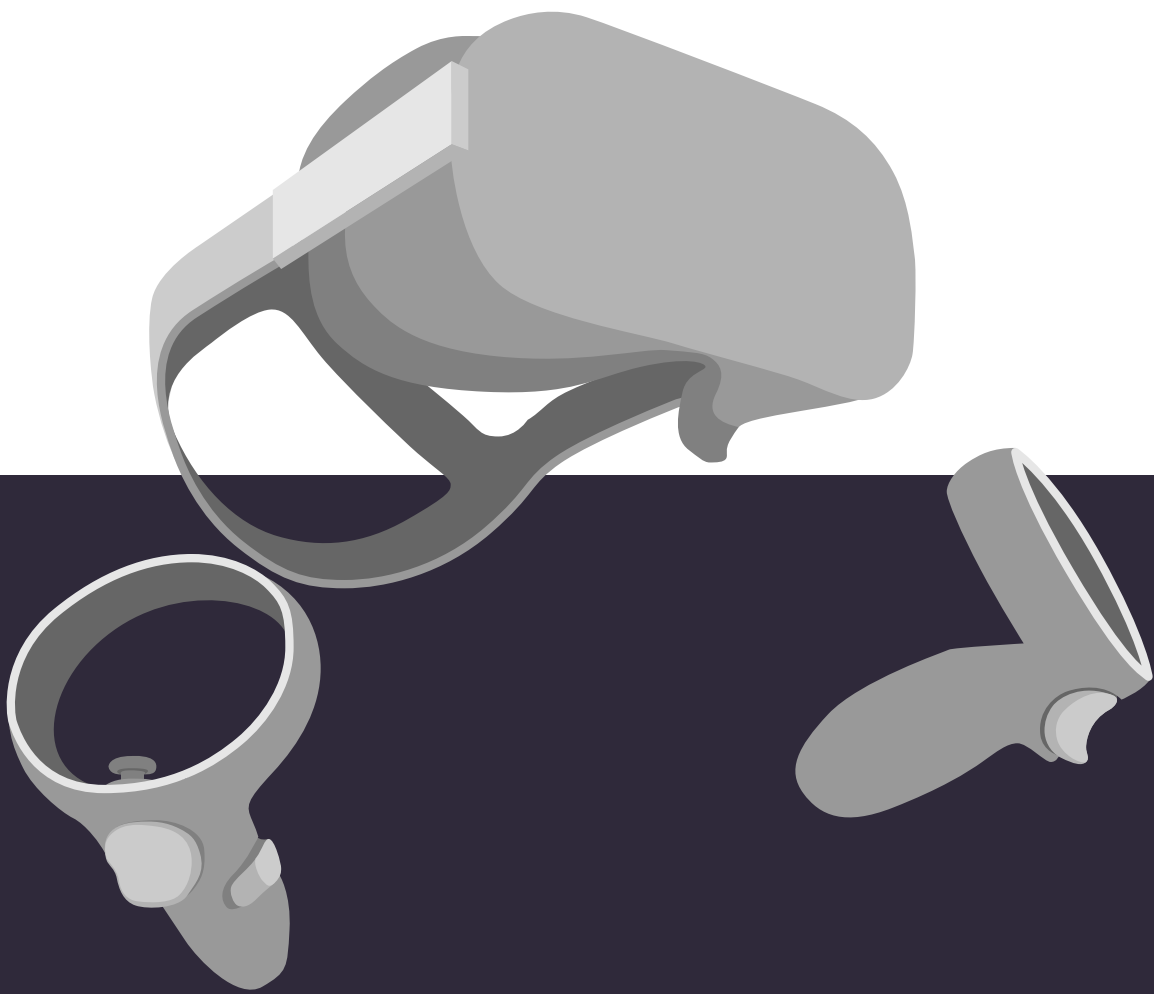
Flight simulators were a safe way to train pilots for high-risk conditions.⁷



1960
The First VR Headset

The first immersive head-mounted display anticipated the future and was Jetsons cool.⁸





TRANSFORMING ENTERPRISE LEARNING

More Than 200 Years of Innovation

Technological evolution over two centuries has contributed to immersive learning today. The past five years have seen accelerating rates of innovation, and many predict that the technology is now at a tipping point and poised for mass adoption.⁹

1780s - 1830s



Panoramic paintings and the invention of photography are the beginnings of virtual reality.

1930s - 1980s



The concept of simulated reality enters science fiction, flight simulators appear, the term “virtual reality” is coined.

1990s - 2000s



Video games, Google Street View, tech advances.

2010s



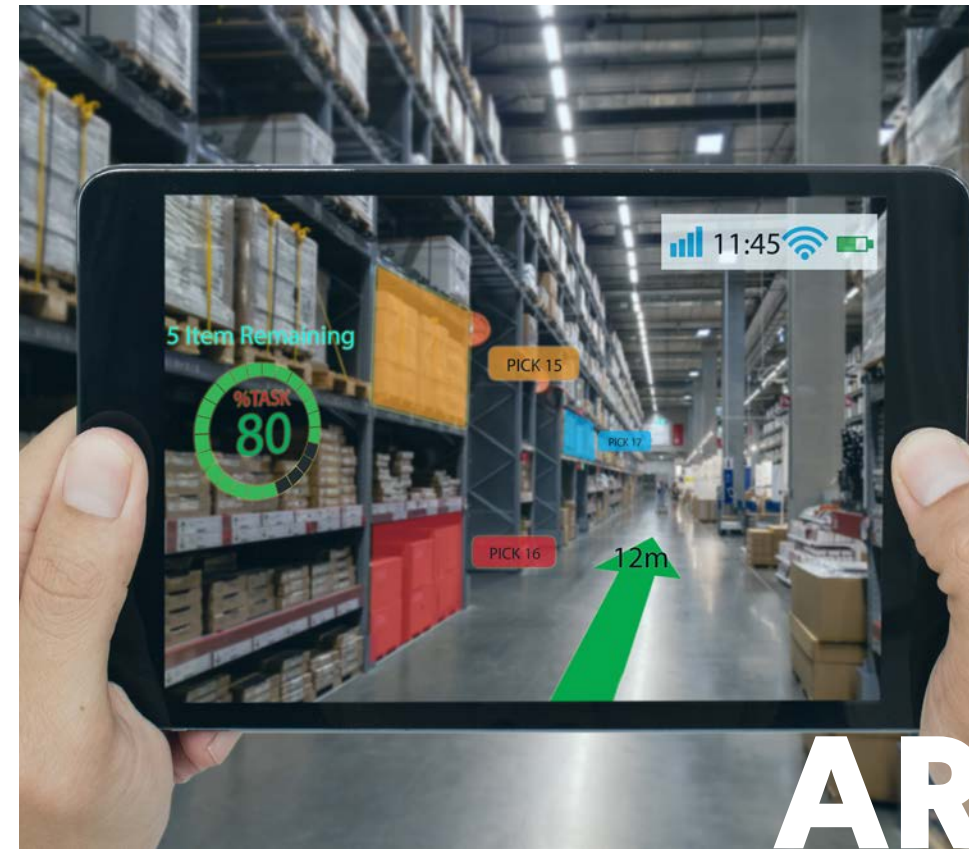
Significant advances in hardware and software support expanded adoption by consumer and enterprise users.

Immersive Experiences Defined



Virtual Reality

A computer-generated experience that simulates reality. VR may include visual, auditory, or tactile experiences.



Augmented Reality

A live experience of a physical space, where computer-enhanced visualizations, sounds, or tactile experiences overlay the real-world environment.



Mixed Reality

A blend of virtual experiences and the real world where virtual and augmented experiences are presented simultaneously.



Extended Reality

Extended Reality is an umbrella term which encompasses the spectrum of spatial computing technologies including augmented reality, mixed reality and virtual reality.

Strong Environment For Social Impact

Social Impact Potential

- Provide broader access to quality, effective education & training for underserved populations in the US and around the world.

Technical Advances

- Processing, Authoring, & Rendering Innovations
- Robust Investment Activity Accelerates Innovation
- Hardware Approaching Consumer Scale Economics

Efficacy Rates

- Situational Training Scenarios
- Higher Engagement & Retention
- Superior Outcomes

Dropping Costs

- Quality Hardware at Consumer Accessible Prices
- Content Development costs dropping rapidly

Market Segments

Our market segments are aligned to our four impact priorities: good jobs and careers, education and training, equity and inclusiveness, and advancement and economic security.

The Immersive Learning Market Scan segments are designed to help a range of stakeholders navigate, understand, and engage a dynamic marketplace of innovators and providers.

We have organized the immersive learning space into two broad categories—one for tools used for soft skills learning and the other for technical skills.

Soft Skills

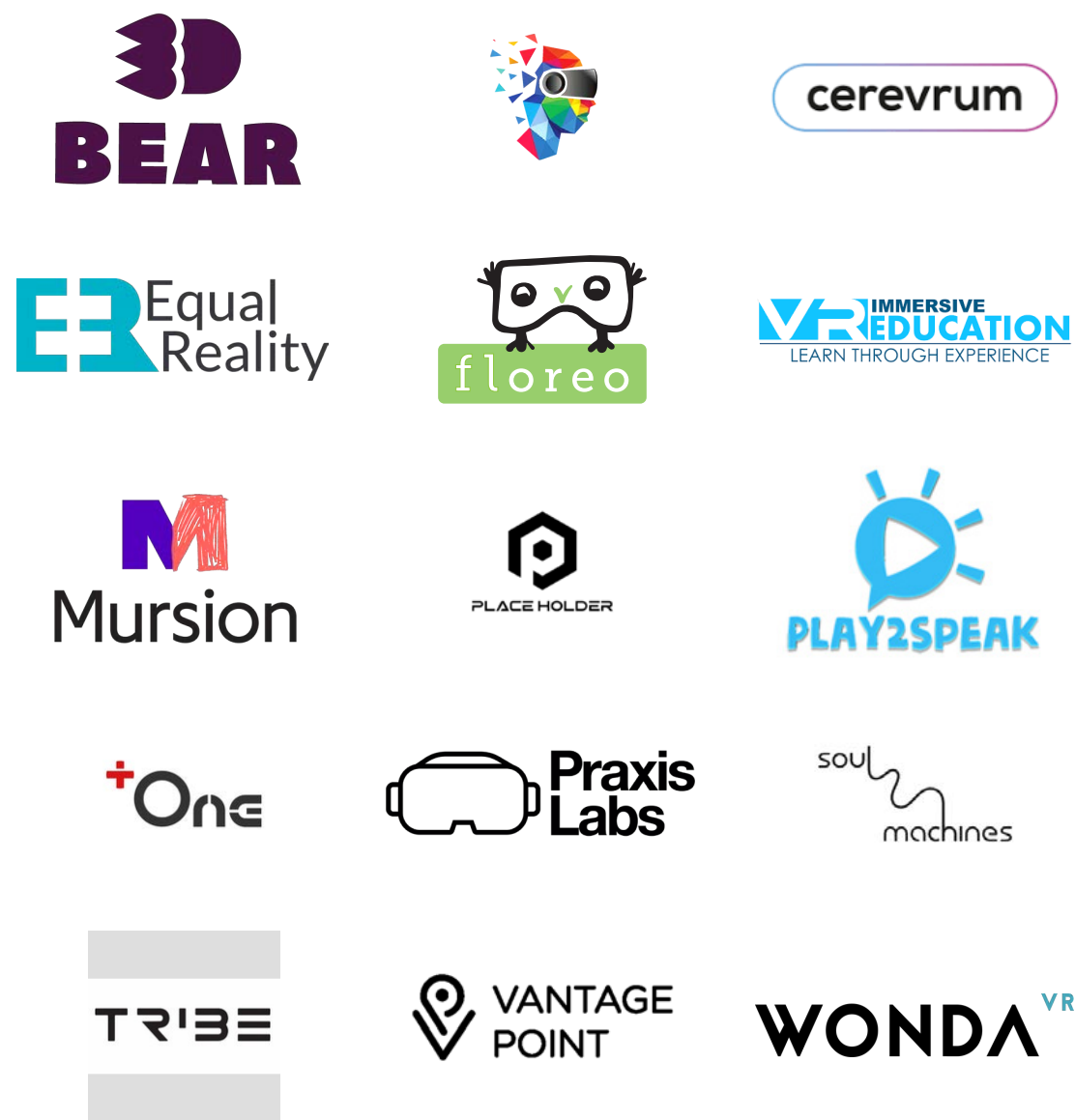
Immersive learning technologies can help people develop human skills, such as empathy, customer service, improving diversity and inclusion, and other areas.

Technical Skills

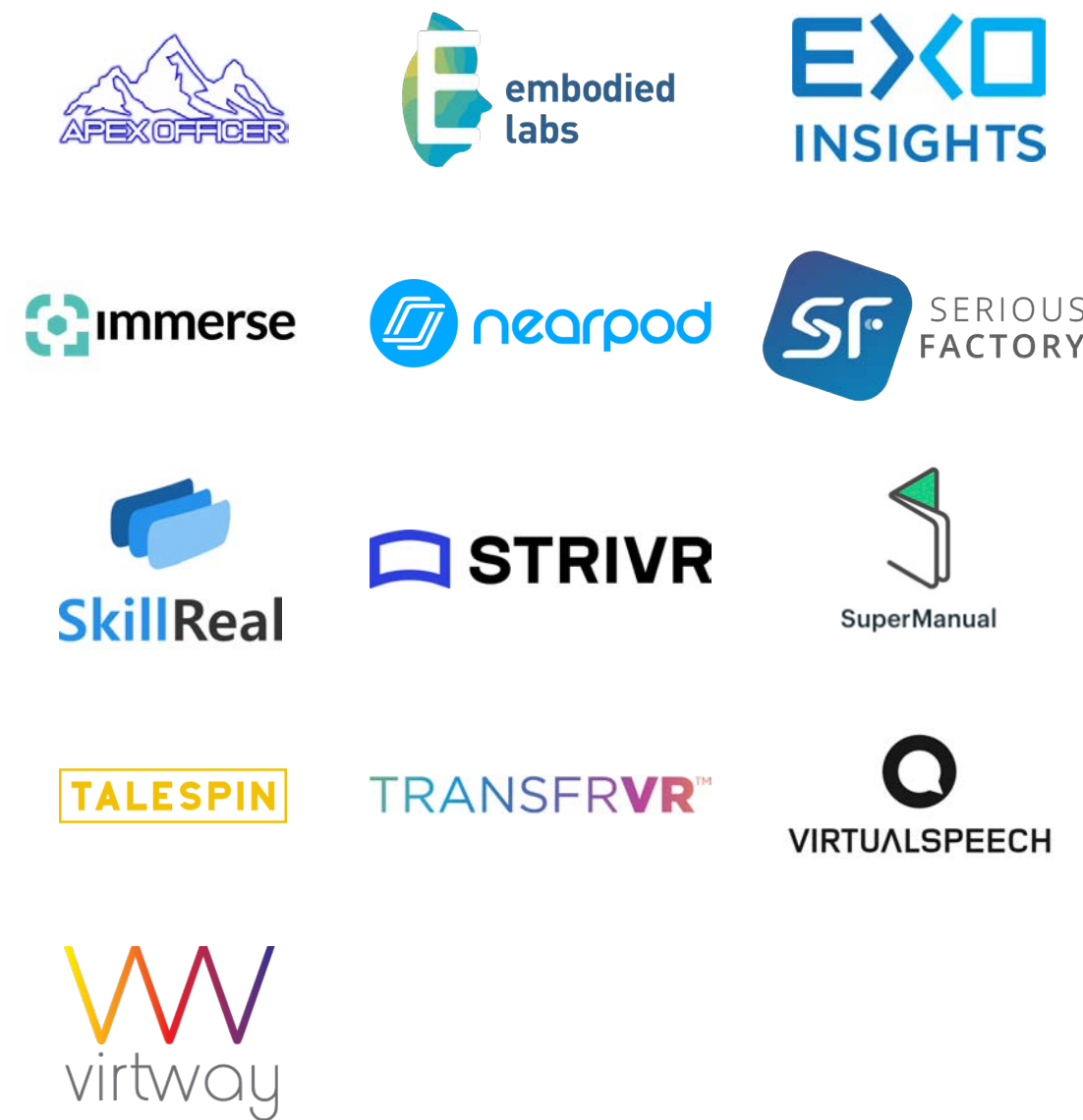
Immersive learning technologies enable workers to learn through simulated experiences, providing the opportunity for risk-free repetition of complex or dangerous technical tasks.

Market Segments - Skills Focus

Soft Skills



Both Soft and Technical Skills



Technical Skills





Immersive Learning Technology Segment

Market Sectors

Immersive learning solutions are generally developed for specific market sectors. In each sector, there are solutions to support our four impact priorities: good jobs and careers, education and training, equity and inclusiveness, and advancement and economic security. Here are some of the market sectors.

Sub-segments

Career and Technical Education

CTE teachers bring the complex world of work to students through immersive technologies, allowing students to explore a range of careers and skills through a single device.

Healthcare

Perhaps the largest and most complex sector, immersive learning is used at all levels, including patient care, diagnosis, even surgery.

K-12 Education

Immersive learning is used in classroom settings to enhance student learning and engagement.

Law Enforcement and Defense

With a focus on potentially life and death situations, immersive learning helps law enforcement and military professionals prepare for high risk situations and develop human skills such as conflict resolution.

Leadership Development

Immersive learning helps leaders learn to manage complex, often high stress situations, such as working with challenging employees and delivering performance reviews. The technology provides a safe, private environment for managers and executives to hone and develop their skills.

Manufacturing

Immersive learning is being used effectively to improve productivity, quality assurance, and digital skills. It's also applied to train workers in using complex, modern equipment.

Safety

High risk, difficult to simulate environments are a perfect fit for immersive solutions. Learning occurs through repetition, in safe simulated environments.

Service Sectors

Immersive solutions in the retail and service sectors are used to train frontline workers in customer service, such as responding to difficult customers and handling complaints. It has also been used for training in food safety and warehousing and logistics.

Skilled Trades

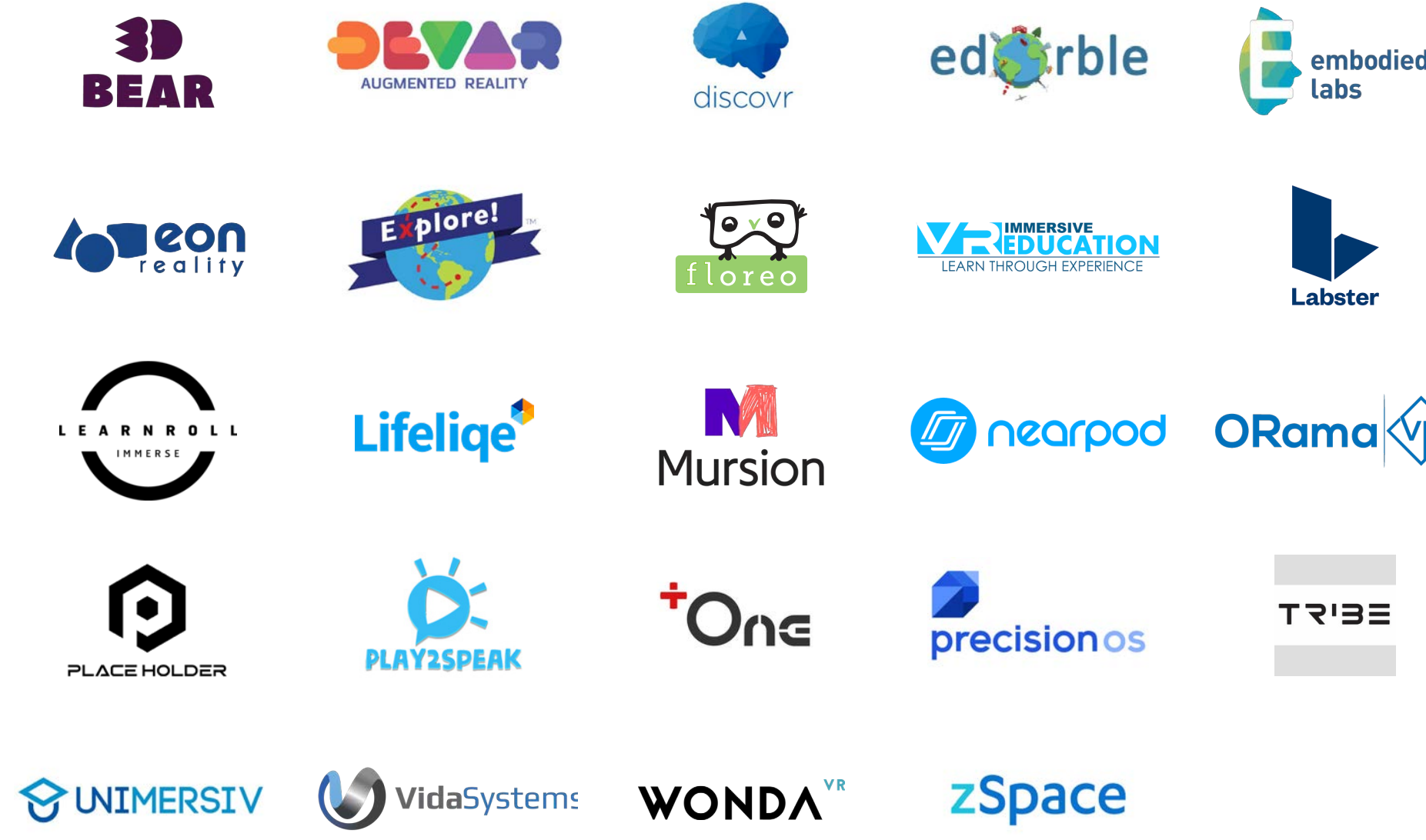
Similar to CTE, immersive learning can be used to teach workers skills in areas with some level of risk, such as HVAC. These solutions allow for real-time assessment and feedback, helping workers learn at a rapid pace.



Market Sectors

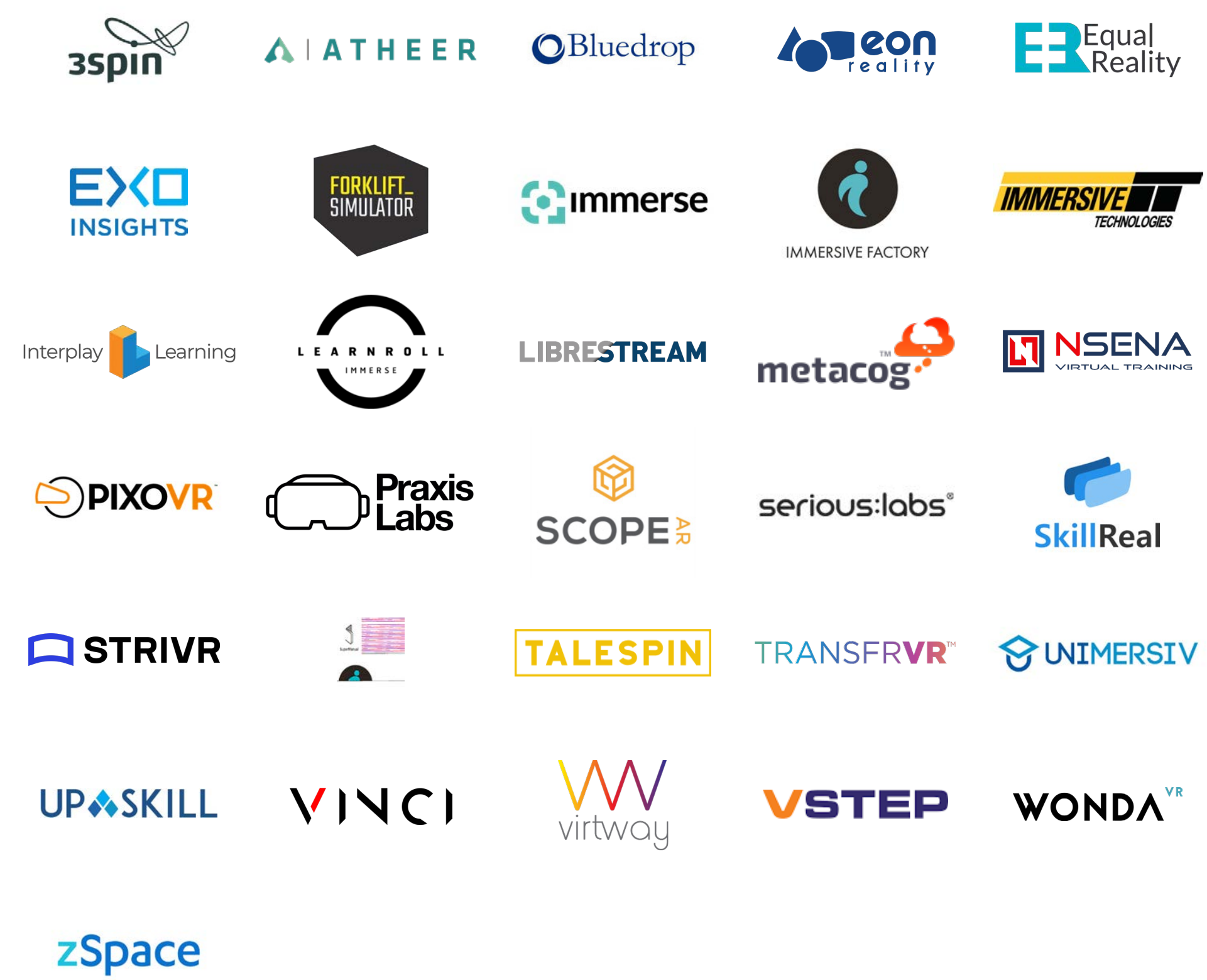
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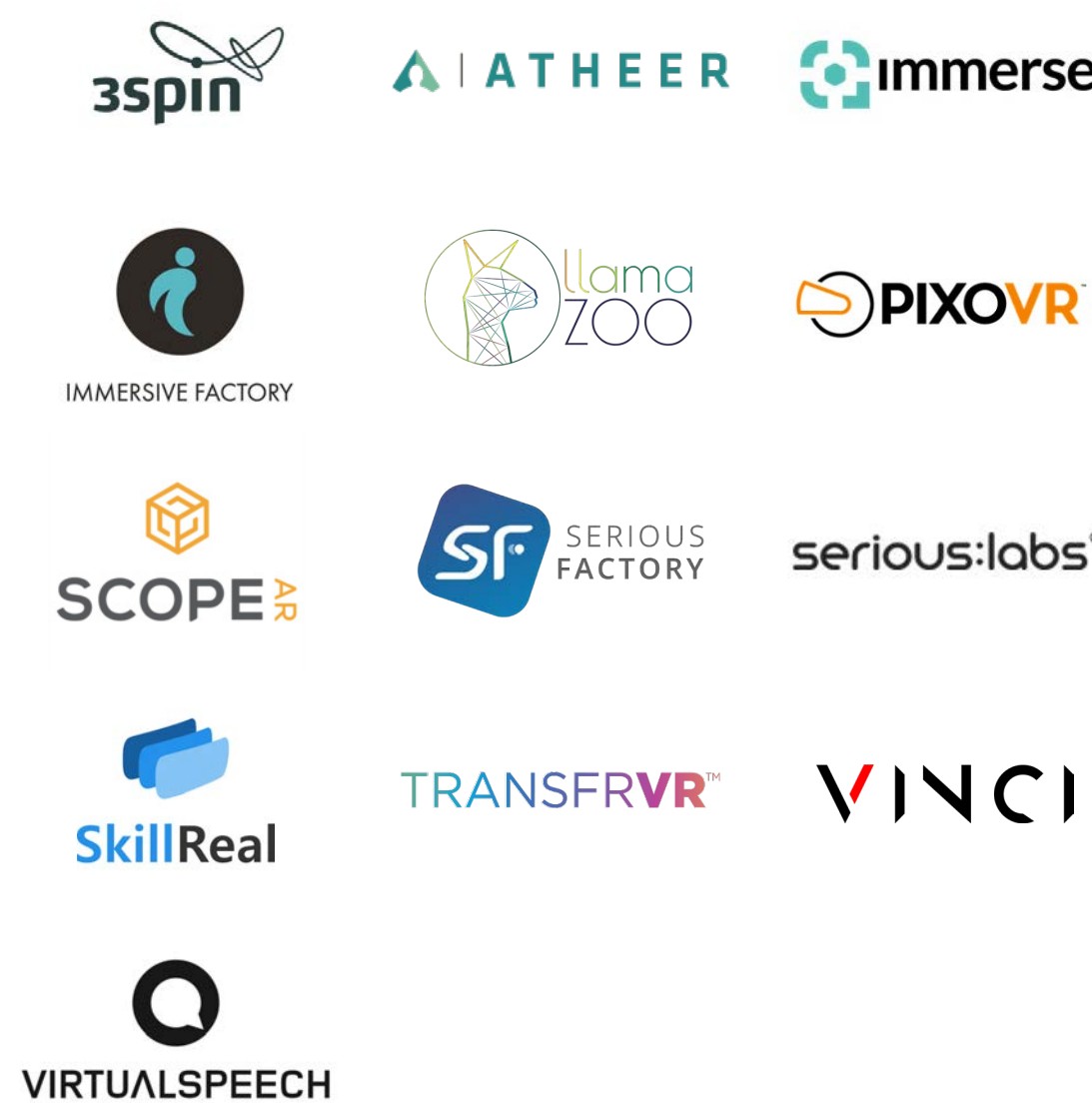
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Immersive Learning Technology Segment

Technology

Numerous technologies are used to develop and deliver immersive learning solutions. Below are five broad categories of technologies we see in the immersive learning market today.

Sub-segments

Artificial Intelligence

Used to create and enhance immersive learning experiences. AI is a powerful tool used to identify, document, and guide the immersive learning experiences. AI can also move the learning experience beyond scripted scenarios, into dynamic, responsive, and lifelike simulations.

Augmented Reality

A live experience of a physical space, where computer-enhanced visualizations, sounds, or tactile experiences overlay the real-world environment.

Mixed Reality

A blend of virtual experiences and the real world where virtual and augmented experiences are presented simultaneously.

Specialized / Proprietary Hardware

Some immersive learning experiences require specialized or proprietary hardware to present the richness of the experience. Distinct from widely available consumer platforms such as Oculus, Vive, and others, examples of specialized hardware may include headsets, glasses, or body sensors.

Virtual Reality

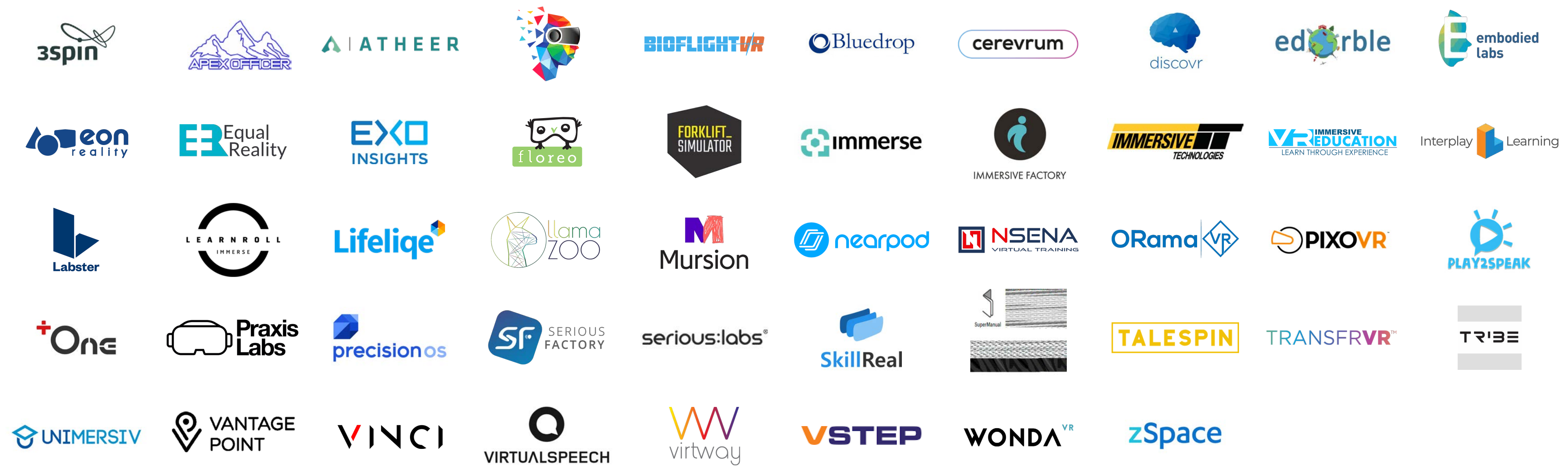
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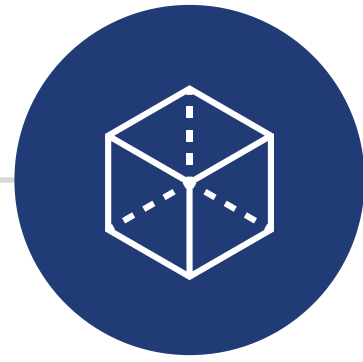
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Immersive Learning Market Scan

Content Development

Advances in technology have shifted immersive learning solutions from expensive, first-generation, customized solutions to scalable product experiences. Below are three high-level approaches to content development we see in the market today.

Sub-segments

Custom Content

Companies in specialized areas may need fully customized training content. While custom approaches can often be expensive, they can realize a valuable return on investment. There are numerous companies and organizations that focus exclusively on content development.

Creation Platform

With this approach, companies create custom content through an authoring software platform and user interface, and produce their own content, including multimedia, using a suite of development and publishing tools.

Content Library

Content libraries allow organizations to use and deliver the same content, saving time and cost. Some customization is generally available, usually by selecting only certain modules aligned to a specific need. Libraries are often focused on specific topic areas, such as soft skills or industry-specific training.

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JFF LABS

2020 Innovators to Watch



Key Performance Indicators

32K

Unique training sessions completed in 2019 by over 8K professional care partners with over 6.5K hours of training.

40%

Ave. percentage of confidence increase in caregiving abilities after completion.

About Embodied Labs

The Embodied Labs platform focuses on providing gesture, voice, and gaze-driven immersive, VR narratives in which the participant, through training modules designed to highlight issues and challenges of living with cognitive changes, experiences symptoms of aging from a first-person perspective as the older adult.

“We can teach anyone caregiver skills - that’s the easy part. [Embodied Labs] helps us connect the skills to compassion.”

- CEO of Saint Anne of Winona

St. Anne of Winona is one of Embodied Labs’ earliest adopters and has collected data that shows staff across a variety of roles have more effective care practices, create more meaningful connections, improve communication skills, and better understand the perspective of the older adult residents for whom they provide care.

Why now?

Immersive technology is becoming ubiquitous as the next major platform after mobile, and it is transforming core aspects of how we care for our loved ones and ourselves - from how we learn new skills and manage our physical and mental health, to how we connect with each other.

What is their competitive edge? Why will they succeed?

As technological companies develop more immersive solutions to equip caregivers with wellness and educational tools, the insurance industry, employee benefits providers, and aging services organizations are recognizing that investment in solutions like Embodied Labs will result in massive cost savings.

What’s their big vision? What does that/success look like?

Their mission is twofold: enhance person-centered care through intellectual and instinctual behavior change and help long-term care providers recruit, train, and retain a quality caregiver workforce.

Embodied Labs is an ETF@JFFLabs portfolio company. ETF@JFFLabs is the social impact fund of JFF that invests in technologies that close skill gaps and improve economic mobility for underserved communities.



Key Performance Indicators

99%

Percentage of users who said they understood what discrimination felt like after training with EqualReality tools

96%

Percentage of users who said they felt prepared to act in the workplace after training with EqualReality tools

89

Net Promoter Score of an inclusive leadership training program that Equal Reality implemented at Carlton & United Breweries

About EqualReality

EqualReality uses virtual reality to help people see life from the point of view of others, including people of different races, genders, or ability levels. The Australian company's systems allow users to "walk a mile in someone else's shoes" to experience discrimination, unconscious bias, and difficult conversations.

Hoping to build a more inclusive culture, Domain Group collaborated with EqualReality and MWAH to offer its employees training that featured a collection of VR experiences designed to promote inclusive leadership and increase awareness of what it feels like to lack privilege and power. Afterward, 98 percent of the 780 participants said they understand the personal role they can play in improving diversity, equity, and inclusion; 93 percent said they see Domain's executive leadership team as fully committed to DEI; and 89 percent said **they are confident to play a role in building an inclusive culture.**

Why now?

A diverse and inclusive work environment can give a company a competitive edge, but it can be difficult to build such an environment. EqualReality's systems can help companies change their cultures with training programs in which people actually experience what bias feels like.

What is their competitive edge? Why will they succeed?

EqualReality's VR system appeals to employees and employers alike and functions efficiently at scale. It has proved to be extremely effective at helping employers achieve their learning objectives. The technology features an inclusive design, so it can be used by many different types of people, including, for example, people who are hard of hearing or have limited eyesight.

What's their big vision? What does that/success look like?

A world that undergoes a transformation as people engage in more inclusive behavior that they learned with the help of VR-enabled experiential training systems.



Key Performance Indicators

\$4.2M

Amount of venture funding Floreo has raised

\$1.7M

Amount of NIH funding Floreo has secured

About Floreo

Floreo harnesses the power of virtual reality to offer a supplementary method of helping people with autism spectrum disorder (ASD) learn social and communication skills. The company has a library of science-based lessons, and its technology gives supervising adults a way to track learners' progress. Schools, therapy practices, and parents use Floreo's tools.

"I'll never forget the experience of demonstrating Floreo at a children's museum in 2017. A minimally verbal child tried out Floreo for the first time. His mother was anxious about the experience. The child went through a couple of lessons. A museum organizer asked the child how it went, and he replied, 'It was cool.' She then asked the mom how she felt, and she said, 'That's the longest phrase I've heard him say.' And right then I knew we were on to something."

—Vijay Ravindran,
CEO and Co-Founder, Floreo

Why now?

Intensive behavioral interventions improve long-term outcomes for people with ASD, but such treatments are expensive and often are not administered consistently. Immersive learning systems like Floreo's are more cost-effective and can be delivered at scale.

What is their competitive edge? Why will they succeed?

Families, clinicians, and educators who support people with ASD have an array of tech tools to choose from, but many of those products haven't been vetted in clinical studies. Floreo has driven groundbreaking research on autism and VR. At Children's Hospital of Philadelphia, Floreo research supported by a National Institutes of Health grant has yielded a half-dozen papers and academic presentations.

What's their big vision? What does that/success look like?

Floreo's mission is not just to create innovative tools, but also to work with researchers, educators, and therapists to demonstrate that its tools positively impact the lives of people with ASD.



Key Performance Indicators

3.5x

Faster training when use VR versus traditional method.

95%

Applicants acceptance rate increases from 40 to 95% when they are vetted in VR first

About Forklift-Simulator

Play-Werk commercialized the world's first virtual reality Forklift-Simulator in 2015. The product combines original equipment manufacturer hardware controls with VR software physics resulting in muscle memory learning. The solution is practical, data driven and engaging. More than 100 blue chip companies around the world currently use it to screen, train and inspire their workforce.

For Forkift-Simulator, they say that "trainers are the real heroes." Trainers use immersive technology to be more productive and get the best out of people.

What trainers are saying:

"Average training time now can be reduced from 45h to 12h."

"First time ever in my career that somebody asked if they could do the training again, so they could achieve a gold medal in VR."

"Within days we can now train a novice and get her/him started on a \$18/h job."

Why Now?

The fast growing logistics industry has to onboard a new generation of operators. Work environments got more high-tech, learning curves steeper but teaching methods hardly changed.

What is their competitive edge? Why will they succeed?

Forklift-Simulator offers the logistics industry's most widely used standardized B2B VR solution. The company is increasing user engagement to optimize learning by applying insights generated from data and feedback from clients.

What's their big vision? What does that/success look like?

Their vision is called Play-Werk: Play Hard, Work Smart. They believe that XR and gamification will change the way people get trained, find jobs, and work. They believe that higher worker engagement will lead to safer workplaces, overall efficiency gains and better paid jobs.



Key Performance Indicators

20%

Month-to-month increase in Interplay's monthly recurring revenue from small and midsize businesses

30%

Percentage of major players (manufacturers and distributors) in the HVAC industry that were Interplay customers in 2019

About Interplay Learning

Interplay Learning offers an online skilled trades training platform called SkillMill that features a catalog of on-demand video-based lessons, 3D simulations, and VR-enabled training scenarios. The company offers both off-the-shelf and highly scalable custom solutions to solve workforce training challenges. More than 75,000 people have used Interplay systems to learn new skills.

In the first week of November 2019, Interplay Learning coordinated an HVAC “mini camp” for the city of Miami’s Pathway to Prosperity program. The goal was to **train 50 low-to-moderate-income people so they’d be qualified to pursue careers as skilled technicians.** The program was modeled on a similar program that Interplay successfully coordinated earlier in 2019 with Labor Finders. Such programs reach students who normally may not have access to training that enables them to improve their skills quickly and advance into better-paying jobs.

Why now?

The skilled trades industry is facing a looming shortage of skilled labor. It is estimated that 60 percent of the people in the U.S. skilled trades workforce will retire in the next decade. Traditional training programs alone won’t be able fulfill the industry’s demand for trained workers.

What is their competitive edge? Why will they succeed?

Interplay develops content for SkillMill using a purpose-built authoring engine called VOLT, which can deliver powerful, job-relevant, immersive lessons at a fraction of the typical cost of creating training content. With VOLT, Interplay creates product-specific training programs for manufacturers and predictive skills-assessment tools for companies and certification organizations. This means Interplay is uniquely positioned to play roles at all levels of skill and career development for people in occupations requiring manual and technical skills.

What’s their big vision? What does that/success look like?

Interplay’s main objective is to offer a new and better path to skill development, employment, and career advancement for the hands-on workforce and thereby strengthen the talent pipeline for the 40 million U.S. jobs that require training in the trades.



Key Performance Indicators

30%

The percentage by which the Net Promoter Score for Mursion training exceeds that of standard training methods

\$80M

Return on a \$350,000 investment in Mursion training by Best Western Hotels

About Mursion

Drawing upon research in learning science, artificial intelligence, and psychology, Mursion harnesses both technology and human interaction to provide training in essential frontline workplace skills. The company's immersive VR sessions are powered by artificial intelligence but also feature live human interaction. With trained professionals orchestrating interactions between learners and digital avatars, Mursion simulations achieve a realism that helps deliver measurable high-impact results.

“Development for today's frontline workforce should focus on skills that machines have trouble replicating, like understanding and interacting with fellow humans. We believe that immersive practice in simulations unlocks human potential. By developing scalable solutions for developing our innately human skills, we can help companies leverage existing investments for greater business and social impact.”

—**Carrie Straub**,
Executive Director of Education Programs and Research, Mursion

Why now?

Traditional in-person workshops and training videos generally do not include opportunities for participants to apply the lessons they're learning. Using Mursion's technology, learners put their skills to the test in real time by entering simulated environments where they interact with virtual people in real-life high-stakes scenarios. Afterward, they meet with a coach to debrief. This is proving to be an effective way to train educators.

What is their competitive edge? Why will they succeed?

People develop key interpersonal skills through cycles of practice, feedback, and coaching. With Mursion's VR technology, learners can do that in a safe and targeted yet realistic way.

What's their big vision? What does that/success look like?

Mursion's goal is to provide a scalable way to help people develop the skills that make us uniquely human, and to be recognized in a wide range of industries as the provider of the premier experiential reality platform for improving and assessing social effectiveness.



Key Performance Indicators

90%

Percentage of training participants who said they were excited to opt in to the next training.

60%

Percentage of users who said they were more comfortable identifying and responding to incidents of bias after participating in the training.

About Praxis Labs

Praxis Labs develops systems that use virtual reality experiences in training programs designed to increase inclusion and belonging in the workplace. Using the VR technology, training participants see life from the perspective of people whose backgrounds or identities are different from their own. They experience incidents of bias or discrimination and practice responding to those incidents. After the VR session, participants use a learning tool that takes them through a guided reflection and provides language, context, and definitions for what they experienced in the virtual setting. The Praxis platform also includes data analytics functionality.

Client Feedback:

“Amazing, felt so realistic, great space to practice.”

“It was more real and meaningful to experience the situation in this setting.”

“I like the optionality of it and how it really helps you put yourself in others’ shoes.”

“It is more real than other trainings—you can better understand and experience others’ perspectives.”

What is their competitive edge? Why will they succeed?

Praxis Labs harnesses powerful technologies to deliver engaging learning experiences designed to increase empathy, reduce bias, and foster sustained behavioral changes among participants. Research shows that learning retention in VR-based exercises can be up to 60 percent higher than it is in training programs that use other mediums. Moreover, VR experiences can increase inclusive behaviors by as much as 22 percent. Using a research-backed curriculum and powerful data analytics, Praxis provides individuals and organizations with insights that help make workplaces more inclusive and productive.

What’s their big vision? What does that/success look like?

Praxis Labs was founded by three women of color who bring their lived experiences to their work. They are passionate about creating workplaces where everyone belongs. Their goal is to create more inclusive workplaces and, ultimately, a more equitable society. They launched their product in the corporate market, but they’re excited about the impact they could have in other sectors that have reputations for systemic inequity, including health care, education, government, and law enforcement.



Key Performance Indicators

1M

Number of sessions conducted in Strivr's VR environment

96%

Percentage of participants in a safety training program who said they felt more prepared to handle dangerous situations

97%

Percentage reduction in time spent learning in a new skills training program, in comparison with traditional methods

About Strivr

Strivr provides a VR-based immersive learning platform that draws on advanced learning theory, data science, and spatial design concepts to transform workplace training. Unlike traditional approaches to training, Strivr's immersive learning systems enable users to engage in applied learning experiences.

"It has changed people's lives, not just because they know how to do their jobs, but because we're giving them opportunities to do things that they never thought they could do or would have had the opportunity to do. That's really incredible."

—Andy Trainor,
Vice President of U.S. Learning, Walmart

Why now?

In today's economy, employers need a more effective way to train workers to ensure that they keep their skills up to date. Strivr's immersive learning tools can help them do that. Employers that use Strivr systems have seen improvements in the ROI of their learning and development programs, and they say immersive learning transforms the employee journey, from hiring and training to upskilling.

What is their competitive edge? Why will they succeed?

Strivr's immersive learning platform engages users physically, and it augments lessons with actionable data and insights, shortening the amount of time it takes users to learn new skills and improving retention. Strivr's VR environment also provides trainees with a safe way to practice risky tasks and become familiar with situations they may not encounter very often in the real world.

What's their big vision? What does that/success look like?

Strivr seeks to democratize learning and help people build confidence and develop skills for life. The company believes its immersive learning platform can provide intuitive and inclusive experiential lessons that inspire all learners, regardless of skill level, educational background, or degree of technical literacy.



Key Performance Indicators

400%

Increase in ability to elaborate on subject matter.

22%

Percentage increase in the accuracy of employee decision making attributed to the use of Talespin's Runway platform

About Talespin

Talespin is a developer of an enterprise extended reality (XR) platform called Runway that, among other things, supports virtual reality training modules, augmented reality performance support tools, and advanced workforce analytics. Runway currently features two core VR training products: Talespin Propel, for teaching object- and process-oriented tasks, and Talespin CoPilot, which uses virtual role-playing exercises to help people develop leadership and communication skills.

“Since partnering with Talespin on our VR training, the results have been pretty stunning. The first major benefit we’ve reaped is accelerated learning. Our employees are able to tackle countless real-life scenarios before being sent out into the field. The VR situations prepare them much faster than traditional classroom learning could. VR training has been a huge confidence-builder for our employees, too. In these virtual situations, trainees have the freedom to fail without making actual mistakes. They have the chance to learn from their errors before taking on real challenges.”

—**Jessica DeCanio**

Head of Claims Training, Farmers Insurance

Why now?

Large organizations are under pressure as automation and the expectations of a new generation of workers impact their workforce practices. Talespin’s technology gives employers the capacity to better recruit, train, and enable people.

What is their competitive edge? Why will they succeed?

Talespin’s platform accelerates employee learning, increases engagement, improves training satisfaction, increases decision making accuracy, and reduces training costs.

What’s their big vision? What does that/success look like?

Talespin hopes to help organizations and workers prepare for the future of work and thrive in the face of relentless technological advances by providing tools that transform the way we transfer knowledge, reduce the time we need to learn, and help us develop the communication and collaboration skills that machines cannot compete with.



Key Performance Indicators

9% to 26%

Percentage of improvements, within the first 30 days, in the performances of trainees who use TRANSFRVR

85% to 93%

Percentage of jobseekers who say they prefer TRANSFR job simulations to traditional training methods

200%

Rate at which customers expand their use of TRANSFR's products after the initial phase of a relationship with the company

About TRANSFR

TRANSFR offers a virtual reality tutoring platform called TRANSFRVR that teaches novices to learn new skills in the same way experts master their crafts—through trial and error. Trainees using TRANSFRVR receive one-on-one guidance from digital coaches in job-training simulations that provide engaging, “hands-on” instruction in a way that traditional training methods cannot.

TRANSFR's virtual pre-apprenticeship **programs allow states and customers to establish high quality training experiences at a fraction of the cost** of developing a physical training facility.

In a survey of jobseekers who participated in the program in Alabama, the company asked, “What would getting this job mean for you?” Survey respondents offered answers like these: “It means I won't have to work two jobs anymore.” and “Finding a career that I can provide a life for my child with.”

Why now?

Employers need to find skilled workers to replace the millions of baby boomers who are retiring every year. Jobseekers need to learn the skills required for jobs that lead to middle-class careers. TRANSFR can help both parties because it focuses on developing a pipeline of talent for jobs that are going unfilled.

What is their competitive edge? Why will they succeed?

TRANSFR has a unique business model: It specifically focuses on training unemployed jobseekers. Moreover, its technology is unique because it coaches users in much the same way a mentor would coach a trainee in an apprenticeship program.

What's their big vision? What does that/success look like?

TRANSFR's mission is to improve the human condition. The company believes it can do that by helping people get their first jobs and find careers.



Key Performance Indicators

88%

Percentage of participants who said they are likely or very likely to attend future sessions

43 minutes

The average amount of time users spend on Virtway's platform—higher than the average of most social media

About Virtway

Virtway, a maker of a virtual environment platform for events and training workshops, collaborated with the Boston University School of Medicine (BUSM) to create a poverty simulation tool that enables the development of tools that have social impact and can be adopted on a wide scale.

By partnering with Virtway, BUSM was able to **develop an immersive training environment in which users could experience poverty firsthand**. The partners believe that their collaborative efforts to develop virtual environments for training health care professionals to better serve the most vulnerable populations will result in improved health outcomes for people in need.

Why Now?

The goal was to create a way for health care professionals to immerse themselves in interactive virtual communities to experience the way poverty negatively affects the health of more than 40 million Americans.

What is their competitive edge? Why will they succeed?

Virtway is a leading partner in efforts to develop mobile virtual environments for social impact. With the company's technology, organizations can offer stakeholders worldwide access to immersive virtual training platforms from the devices they already use.

What's their big vision? What does that/success look like?

Virtway aims to provide communities across the country and around the world with the ability to connect and learn in immersive virtual environments. The company's mission is not only to improve professional training and development programs but also to help drive a better understanding of who we are as individuals and enable people to address their differences.



More Great Companies to Watch

After reviewing more than 300 organizations from around the world that are involved in immersive learning, we performed deep dives on around 60 companies to develop this market scan. The lineup features mission-aligned companies and nonprofit organizations of all sizes, from seed-stage startups founded by inspiring innovators to growth-stage enterprises that are already creating significant social impact and business value.



Immersive Learning Technology Landscape

Market Scan

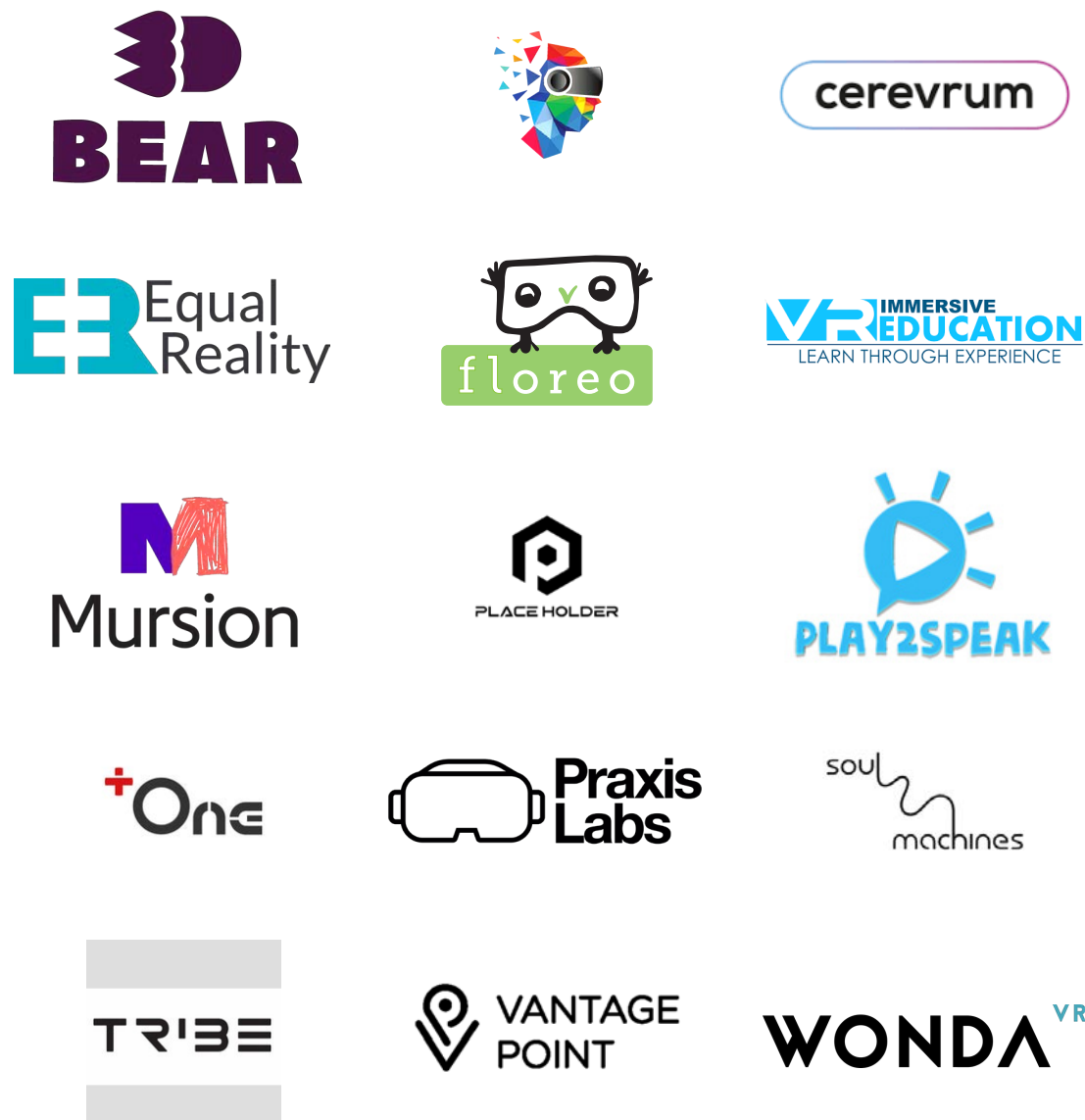
Virtual and augmented reality technologies for use in frontline and middle-skill jobs and roles.

JFFLabs Accelerator Cohort Partners

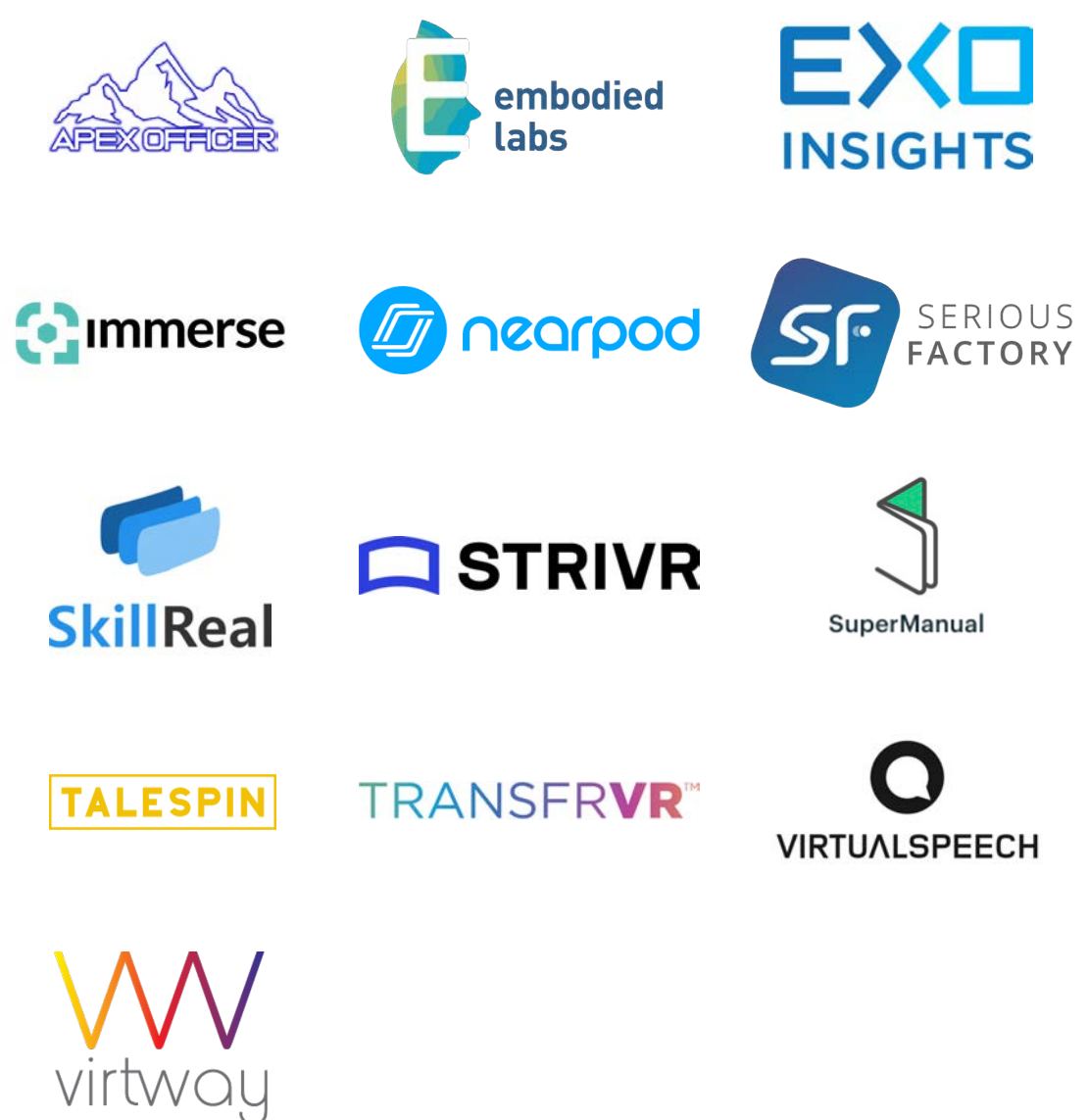


Market Segments - Skills Focus

Soft Skills



Both Soft and Technical Skills



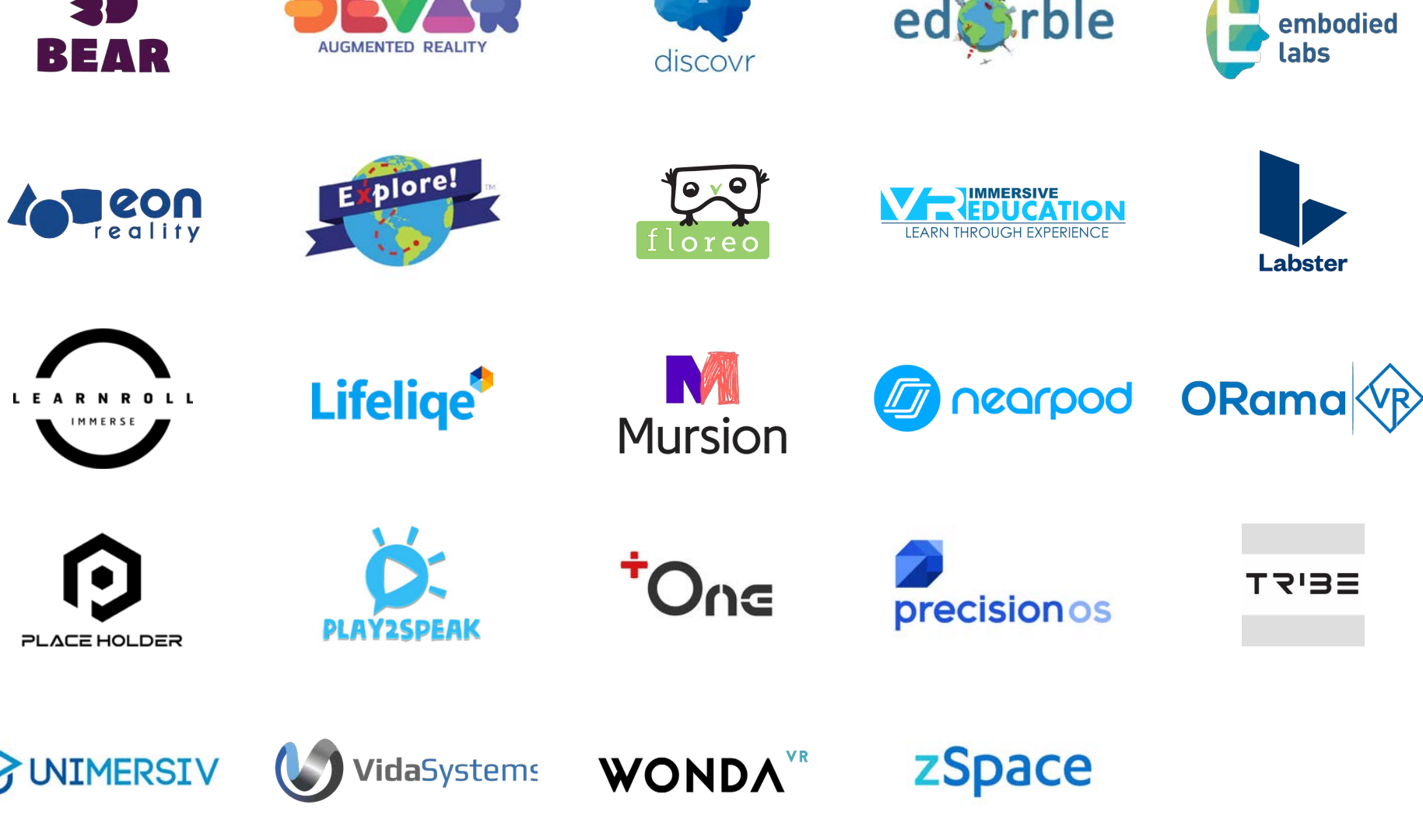
Technical Skills



Market Sectors

K-12 Education

Immersive learning is used in classroom settings to enhance student learning and engagement.



Career and Technical Education

CTE teachers bring the complex world of work to students through immersive technologies, allowing students to explore a range of careers and skills through a single device.



Skilled Trades

Similar to CTE, immersive learning can be used to teach workers skills in areas with some level of risk, such as HVAC. These solutions allow for real-time assessment and feedback, helping workers learn at a rapid pace.



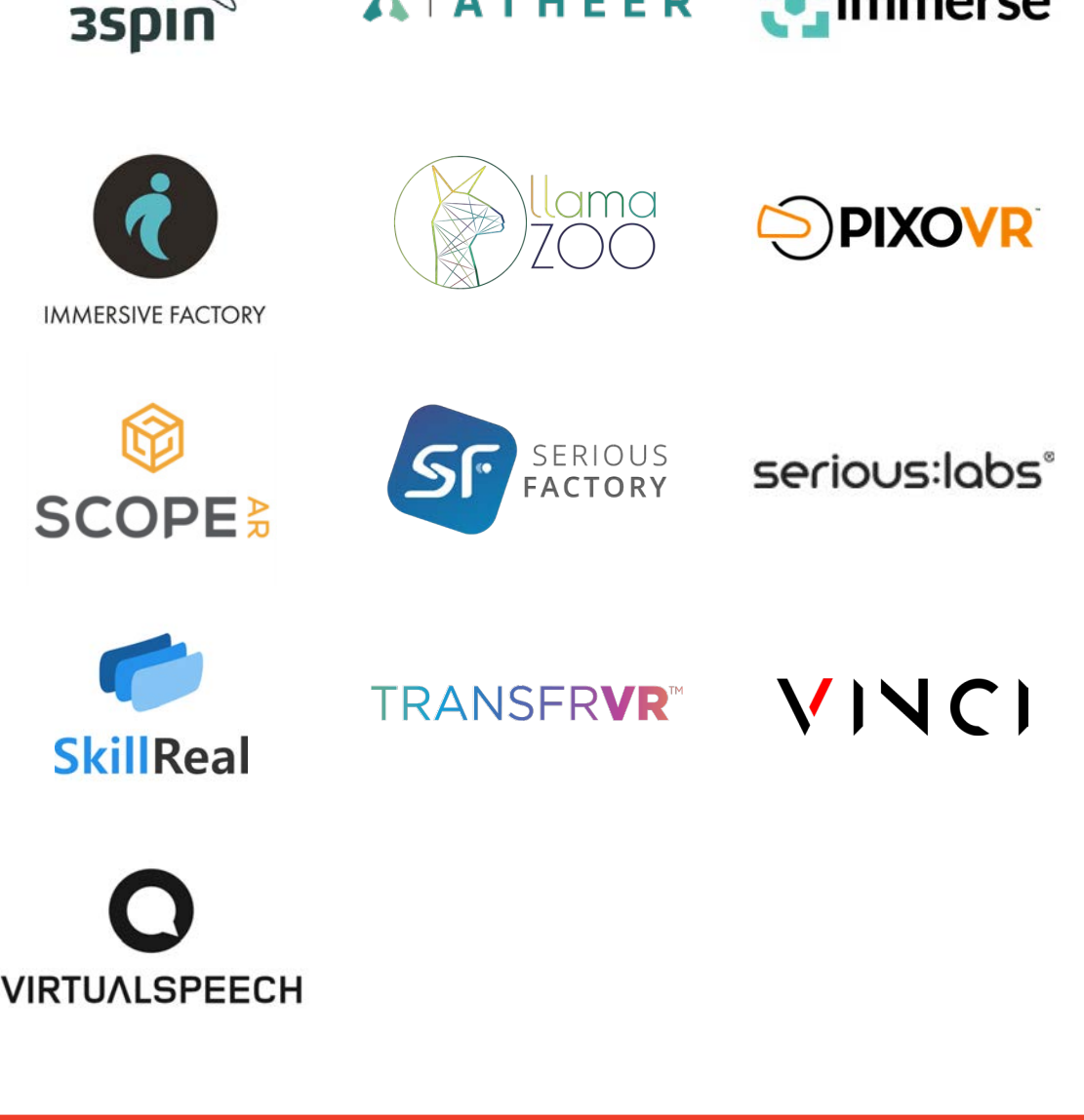
Service Sectors

Immersive solutions in the retail and service sectors are used to train frontline workers in customer service, such as responding to difficult customers and handling complaints. It has also been used for training in food safety and warehousing and logistics.



Manufacturing

Immersive learning is being used effectively to improve productivity, quality assurance, and digital skills. It's also applied to train workers in using complex, modern equipment.



Leadership Development

Immersive learning helps leaders learn to manage complex, often high stress situations, such as working with challenging employees and delivering performance reviews. The technology provides a safe, private environment for managers and executives to hone and develop their skills.



Healthcare

Perhaps the largest and most complex sector, immersive learning is used at all levels, including patient care, diagnosis, even surgery.



Law Enforcement and Defense

With a focus on potentially life and death situations, immersive learning helps law enforcement and military professionals prepare for high risk situations and develop human skills such as conflict resolution.



Safety

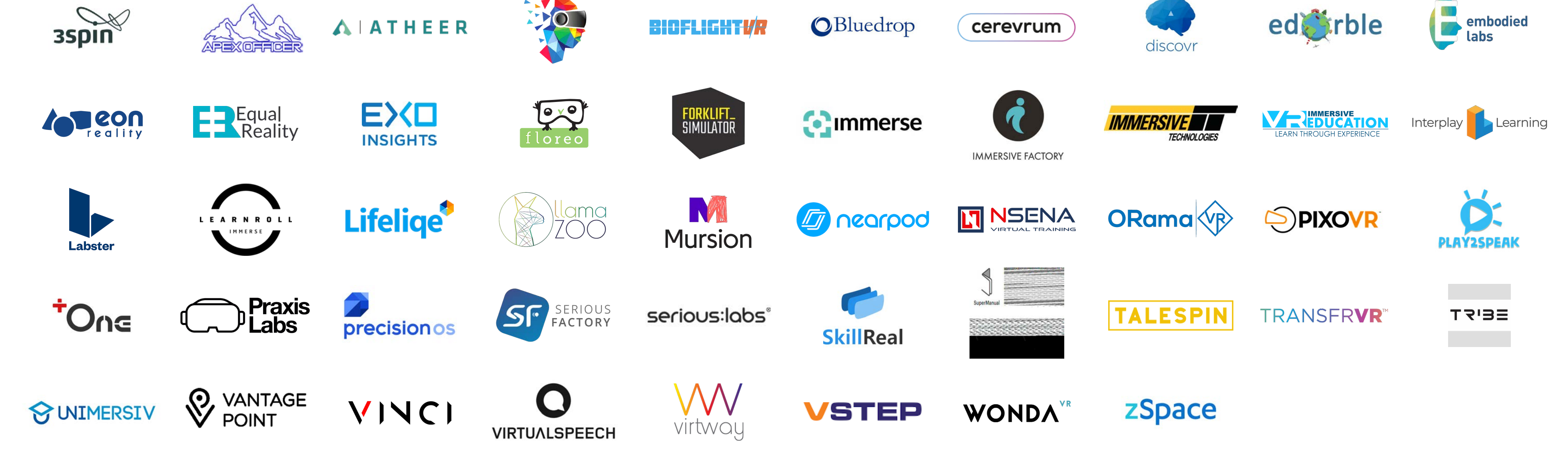
High risk, difficult to simulate environments are a perfect fit for immersive solutions. Learning occurs through repetition, in safe simulated environments.



Technologies

Virtual Reality

A computer-generated immersive experience that simulates reality. VR may include visual, auditory, or tactile experiences.



Mixed Reality

A blend of virtual experiences and the real world where virtual and augmented experiences are presented simultaneously.



Augmented Reality

A live experience of a physical space, where computer-enhanced visualizations, sounds, or tactile experiences overlay the real-world environment.



Specialized / Proprietary Hardware

Some immersive learning experiences require specialized or proprietary hardware to present the richness of the experience. Distinct from widely available consumer platforms such as Oculus, Vive, and others, examples of specialized hardware may include headsets, glasses, or body sensors.



Artificial Intelligence

Used to create and enhance immersive learning experiences. AI is a powerful tool used to identify, document, and guide the immersive learning experiences. AI can also move the learning experience beyond scripted scenarios, into dynamic, responsive, and lifelike simulations.



Content Development

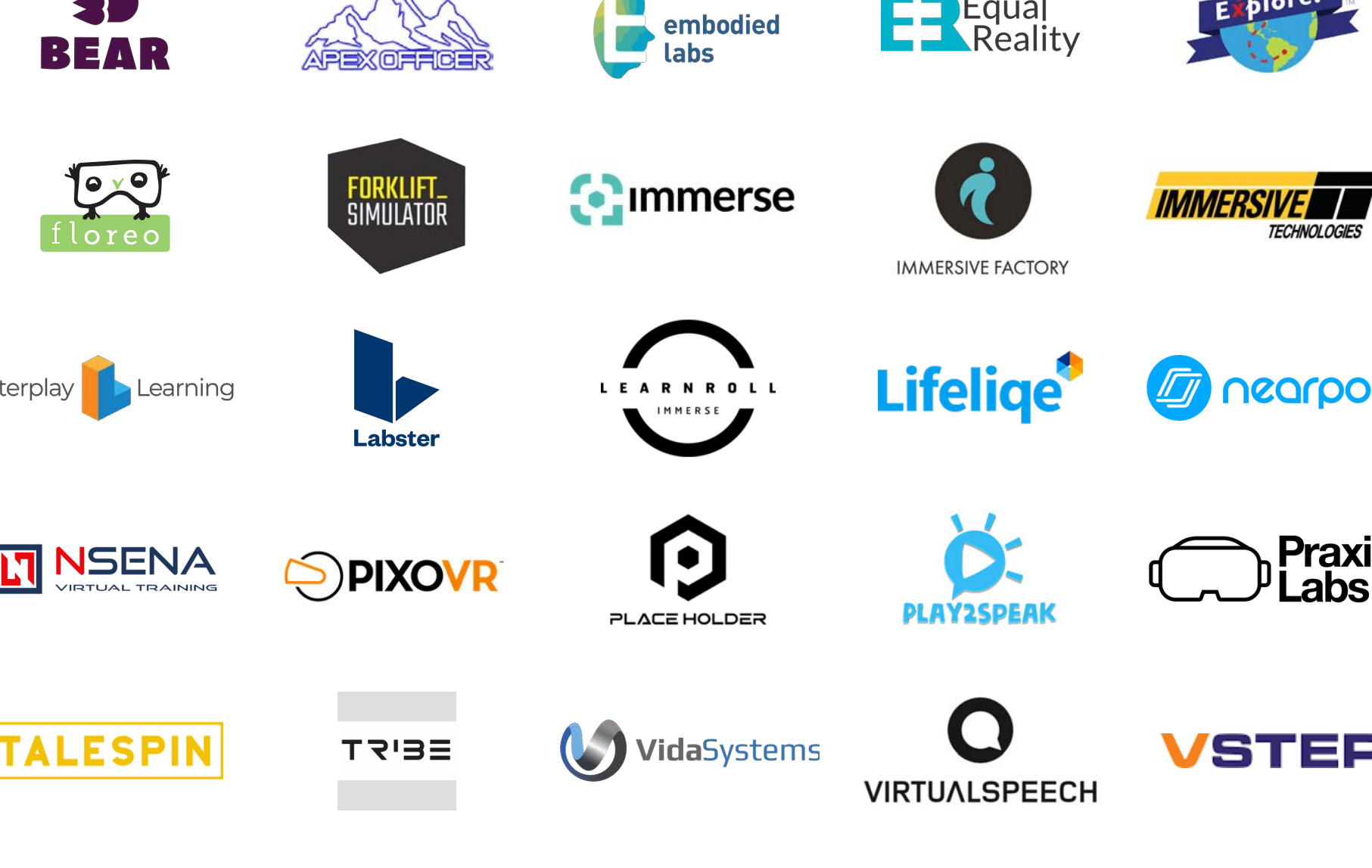
Custom Content

Companies in specialized areas may need fully customized training content. While custom approaches can often be expensive, they can realize a valuable return on investment. There are numerous companies and organizations that focus exclusively on content development.



Content Library

Content libraries allow organizations to use and deliver the same content, saving time and cost. Some customization is generally available, usually by selecting only certain modules aligned to a specific need. Libraries are often focused on specific topic areas, such as soft skills or industry-specific training.



Creation Platform

With this approach, companies create custom content through an authoring software platform and user interface, and produce their own content, including multimedia, using a suite of development and publishing tools.





The enterprise market will lead: Immersive learning is poised for dramatic growth in the enterprise space over the next five years. Overall, the VR/AR/MR/XR industry will increasingly focus on the enterprise market. This is a shift from the industry's strong engagement with consumers in recent years in areas such as gaming.



Immersive learning works, often better than traditional approaches:

Demonstrated efficacy for learning and development for both soft and technical skills will accelerate adoption.



VR leads for now:

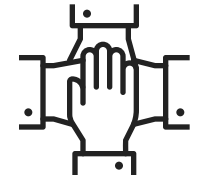
Virtual reality will grow faster than augmented, mixed, or extended reality solutions in the near term.



Prices will continue to drop:

Programmatic approaches and technologies like AI will continue to bring down the cost of content development and delivery.

Social Impact



Adoption results in social impact:

Immersive learning can provide people from underserved populations with broader access to high quality education and training opportunities. Immersive learning models have also shown strong outcomes for people who may have struggled with traditional training methods or have a need for basic skills that will lead to a job. As adoption grows, we anticipate increased positive social impact in the form of access to jobs and careers, sustained employment, skills development, and other areas.



Developing and growing leaders:

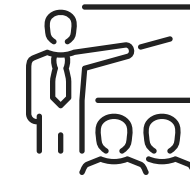
Immersive learning is revolutionizing management training. In what could prove to be one of the technology's most positive social impacts, immersive learning is helping leaders to be more empathetic, inclusive, and more aware of unconscious bias, as they manage teams and shape the cultures of their organizations.

Enterprise Engagement Leads the Day



Enterprise market will grow rapidly:

The enterprise market is poised for growth. Business Insider predicts that the enterprise VR training market will reach \$5.5 billion in revenue by 2023. This represents growth of 587 percent from 2018's estimated \$800 million in revenue. The long-term outlook for consumer adoption of VR technology is strong, but for the next few years, consumer adoption will lag behind the enterprise market.



The evolution of work creates demand for new training solutions:

As the world of work evolves, the need for new and more effective approaches to training is greater than ever. The need is complex and multifaceted, encompassing demand for new ways to teach both technical and interpersonal skills.

Poised for Transformative Adoption



Efficacy and efficiency drive adoption of immersive learning:

Immersive learning systems are capable of delivering more effective training experiences at a lower cost than other approaches. Broader awareness of the superior efficacy of immersive learning will spur interest and adoption.



Applications span industries:

While our scan is focused on frontline entry-level and middle-skill workers and learners, there is dramatic adoption of immersive learning in a variety of industries, including defense, aerospace, mining, energy, law enforcement, health care, transportation, and the skilled trades.



Immersive learning is a global phenomenon:

The changes we see in the world of work are global and so are the solutions. In Australia, companies like Equal Reality and BeingVR are using immersive learning to advance diversity, equity, and inclusion. In Canada, a number of startups are building solutions for the aerospace, manufacturing, energy, and defense industries. In France and Spain, companies are focused on the use of immersive reality in safety training. Japanese companies are innovating in mixed reality, and a company in New Zealand is reimagining human-computer interactions at work.

Conclusions

Think of a child learning to play chess 200 years ago, studying the game through books and 1:1 game play. Today, anyone can experience dozens of games and hundreds of chess problems in a single day, allowing for exponentially more learning opportunities in a much shorter time. (Poker is another good example here.)

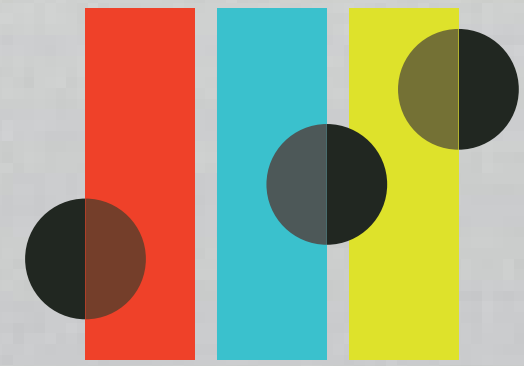
This is the central experience and opportunity of immersive learning today—controlled learning situations that simulate real world experiences, enabling effective and efficient learning by providing safe environments with unlimited tries and do-overs. We can now learn better and faster.

Immersive environments allow people to learn complex skills rapidly and effectively. They can help train a manager how to better interact with employees, and provide new skills to a frontline worker responding to an angry customer.

Today, we see learning and development at a tipping point, where the technological capabilities are sophisticated enough, and the cost of development and adoption are low enough, that immersive learning will transform every aspect of education, work, training, development—you name it.

Where once these technologies were only accessible to huge enterprises like Walmart or Ford Motor Company, within five years almost every small- to medium-sized business across the United States will leverage immersive technologies in some way to train their employees.

We are excited for today, and tomorrow, and look forward to continuing our partnerships with innovators, investors, employers, learning providers, educators, and others as we work to revolutionize learning and help people gain the skills needed for sustained, fulfilling, and secure careers. We are just beginning to understand the power of these technologies and solutions.



CENTER FOR APPRENTICESHIP & WORK-BASED LEARNING



In Partnership with the Center for Apprenticeship & Work-Based Learning

Launched in 2017, the Center for Apprenticeship & Work-Based Learning provides network and advisory services, training, and resources to employers, policymakers, and workforce development organizations as part of JFF's strategic offerings.

The Center also plays an important role in highlighting innovations that expand opportunities for people of color, women, opportunity youth, people with disabilities, and others who have traditionally been underrepresented in career advancement opportunities and well-paying jobs.

We believe in the power of apprenticeship and work-based learning, and we believe that with better access to the right information and support, this emerging community can drive this movement forward, improve people's lives, strengthen the American workforce, and provide businesses with the skilled workers they need to grow and prosper.

For more information, visit JFF's Center for Apprenticeship & Work-Based Learning, www.jff.org/center.



“Immersive learning through VR has proven to be critical to scaling our training program at Walmart. With VR we can deploy consistent, engaging training that simulates real-world experiences. We’re excited to support the work of JFFLabs to bring immersive learning and work-based learning to the retail industry and beyond.”

- Andy Trainor,
Vice President, **Walmart US Learning**



With Funding from Walmart

Our Impact Accelerator is designed for entrepreneurs and growth-stage startups offering immersive learning solutions that will identify, select, and support the training of entry-level and middle-skill talent in many industries.

The market scan and accelerator cohort are made possible through the generous support of Walmart.

About Walmart

Walmart Inc. (NYSE: WMT) helps people around the world save money and live better—anytime and anywhere—in retail stores, online, and through mobile devices. Each week, more than 275 million customers and members visit Walmart’s more than 11,300 stores under 58 banners in 27 countries or shop at its ecommerce websites. Walmart reported fiscal year 2019 revenue of \$514.4 billion and employs more than 2.2 million associates worldwide. Walmart is a leader in sustainability, corporate philanthropy, and employment opportunity. To learn more, visit corporate.walmart.com.

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