

Virtual Reality: The Gateway to Next-Generation Skill Development and Talent Attraction

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Abstract:

This paper explores the transformative role of virtual reality (VR) as a gateway to the future of skill development and talent attraction. As the technological landscape continues to evolve rapidly, traditional approaches to learning and recruitment are being redefined. VR emerges as a disruptive force, offering immersive and interactive experiences that transcend the limitations of conventional training and recruitment methods. We are examining the current challenges in skill development and talent acquisition, emphasizing the need for innovative solutions to bridge the gap between education and industry demands. It then goes into the capabilities of virtual reality technologies, showcasing their potential to revolutionize skill acquisition by providing realistic and context-rich learning environments. Through simulations and interactive scenarios, VR not only enhances traditional training methods but also enables the acquisition of complex skills in a risk-free and adaptive manner. The discussion presents facts from various industries to illustrate the successful implementation of VR in skill development and talent attraction.

Keywords:

VR training, gamification, skills shortage, talent attraction

1. Introduction

VR's roots date back to the mid-20th century (Figure 1). However, it took until the end of the 20th century, with the development of rudimentary head-mounted displays and interactive simulations, for VR to take concrete form. Over the past few decades, VR technology has grown exponentially, driven by advancements in hardware capabilities, improvements in software, and a deeper understanding of the psychological aspects of immersion. The journey in VR development has been an amazing one, but it hasn't been without its challenges. High cost, limited access, and the need for powerful computing hardware were the initial barriers to widespread adoption. Additionally, the quality of early VR experiences was often not good enough to create truly engaging and immersive virtual worlds. Overcoming these hurdles required a collaborative effort by researchers, developers, and industry pioneers.

An important change in the VR environment is the transition from PC-based VR (PCVR) systems to standalone VR devices [1]. Traditionally, VR experiences have been associated with high-powered computers, limiting accessibility and practicality. The advent of standalone VR, featuring standalone devices with integrated computing power, frees users from relying on fixed setups. This move democratized VR, making it more accessible to a wider audience and opening the door to new applications beyond gaming and entertainment.

As we consider the transformative potential of VR [3] in skill development and talent acquisition, it is important to recognize the complex evolutionary history that has brought us here. This article explores the challenges being overcome and the opportunities presented as VR evolves, and explores the new ways in which immersive experiences can change and

redefine how individuals acquire skills and organizations interact with top talent. We will focus on the transition to standalone VR as a catalyst for the times.

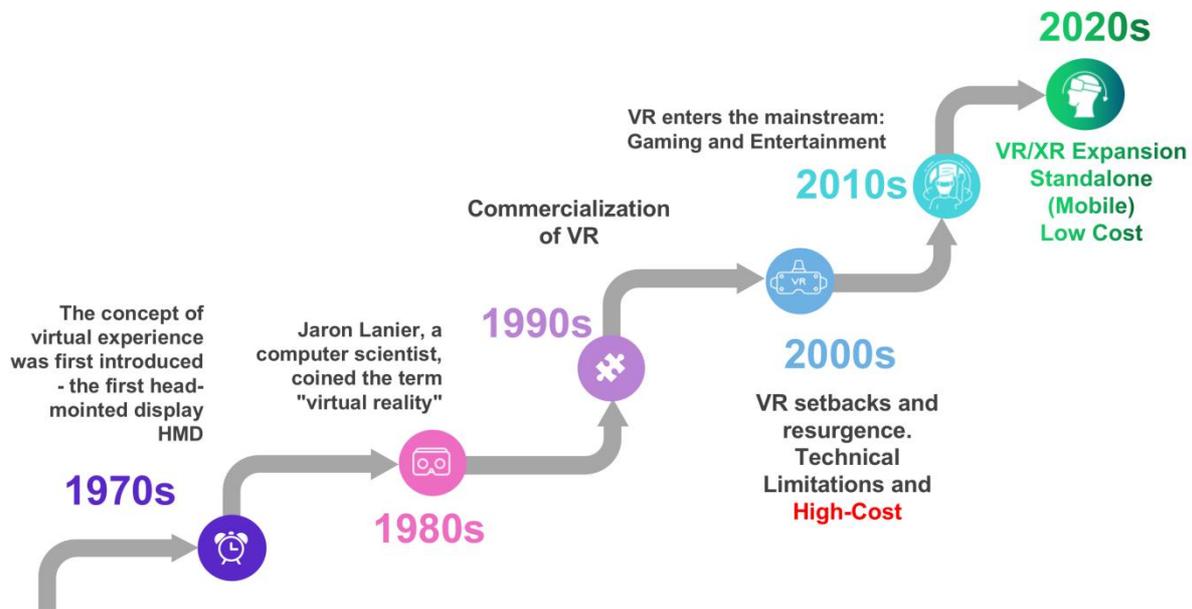


Figure 1. History of VR Technology Development

2. Transformation from PCVR to Standalone VR

VR technology has undergone a remarkable evolution, marked by a technological transformation from connected PC-based VR systems to the revolutionary era of standalone VR. As we undertake this research, it is important to understand the technical complexities underlying this transformative change [2][3].

In the early stages of VR development, users were tied to powerful PCs and required cables and external devices to achieve a seamless VR experience. The demand for high-end computing power and specialized equipment has limited access to VR to a select few and limited its use to specific fields. However, dynamic advances in hardware and software technology have ushered in a new era for VR, and standalone VR devices have proven to be a game-changer. Moving from PCVR to standalone VR is more than just a change in form factor. This represents a fundamental shift away from dependence on external computing resources, with standalone VR devices integrating powerful processors, graphics capabilities, and sensors in a compact format, freeing users from the limitations of physical connectivity. I'll release it. This change will not only improve mobility, but also make VR more accessible to a wider audience, democratizing it.

Technological advances, such as the development of efficient mobile processors, have played a key role in making standalone VR a reality. These processors are designed to deliver robust computing performance in compact devices, enabling VR experiences without sacrificing quality. Additionally, advances in sensor technology such as inside-out tracking and gesture recognition are increasing the immersive and interactive nature of standalone VR, further blurring the lines between the virtual and physical worlds.

3. Gamification

Gamification, a concept based on the integration of game elements and mechanics into non-game environments, is a transformative force in the field of human interaction and motivation. Originating from the ancient use of games and challenges in early civilizations to teach skills, gamification has evolved significantly, especially with the advent of digital technology.

Since ancient times games have been an integral part of human culture serving not only as a source of entertainment but also as a powerful tool for education and skill development. Early civilizations recognized the educational value of games and challenges and used them as effective means of teaching basic skills and knowledge.

The digital age ushered in a new dimension of gamification, marked by the rise of serious gaming in the late 20th century. These serious games were notable for serving purposes beyond entertainment, such as training, simulation, and behavior modification. In pursuit of more effective learning methods, serious games seamlessly integrate game mechanics to increase engagement and make learning new skills and knowledge a more dynamic and interactive process.

Serious games represented a paradigm shift in using game elements for purposes beyond traditional entertainment. By combining game design principles with educational and behavioral goals, serious games have provided a powerful combination that engages users while promoting learning and skill development. Incorporating game mechanics such as points, levels, and rewards adds a level of immersion to these experiences, creating an environment that fosters cognitive engagement and improved memory retention. The field of gamification is constantly evolving with continuous research and innovation aimed at finding new ways to promote engagement, motivation, and behavior change in a variety of situations. This development goes beyond traditional gaming platforms and permeates many aspects of daily life, from education and training to health and professional development.

In today's context, gamification is a dynamic field that provides a versatile toolkit for designers and educators looking to create experiences that attract, motivate, and encourage desired behaviors. As technology advances, the potential applications of gamification are expanding, opening new frontiers for leveraging the inherent appeal of games to achieve meaningful outcomes in non-gaming contexts.

Gamification in VR training [4][5] is a powerful and innovative approach to improving the learning experience. By integrating gaming elements into the training process, companies/organizations can make learning more engaging, immersive, and effective.

Here we consider important aspects of gamification for training in VR:

1. Immersive learning environment:

VR offers unique advantages by creating immersive environments that recreate real-world scenarios. Gamification goes a step further and adds interactive elements such as challenges, quests, and simulations to make the learning experience more engaging and memorable.

2. Motivation and commitment:

Games are designed to be entertaining by their nature. By implementing game mechanics like points, rewards, and levels into the VR training, participants are more likely to stay motivated and engaged. The sense of accomplishment from overcoming a challenge or reaching a higher level contributes to a positive learning experience.

3. Scenario-based learning:

VR gamification allows creation of realistic scenarios that for example employees might experience in their roles. This approach allows learners to apply knowledge to practical situations and improve problem-solving and decision-making skills. VR simulation can recreate complex situations that are difficult to simulate using traditional training methods like classroom or e-learning.

4. Progress tracking and feedback:

Games provide instant feedback on performance and help learners and trainees recognize their strengths and opportunities for improvement. VR training with gamification features can track progress, provide real-time feedback, and provide personalized learning paths. This not only contributes to continuous improvement, but also promotes a sense of accomplishment.

5. Collaborative learning:

Many games encourage collaboration and teamwork. Applying these principles to VR training encourages participants to work together to achieve a common goal. This collaborative learning environment can improve communication skills, teamwork, and the ability to solve problems as a group.

6. Adaptive learning path:

VR gamification enables adaptive learning experiences. The system can dynamically adjust task difficulty based on learner performance, ensuring training is both challenging and achievable. This personalized approach maximizes the efficiency of the learning process.

7. Behavior change and skill transfer:

The immersive nature of VR combined with gamification increases the potential for behavioral change and skill transfer. Learners can practice and reinforce desired behaviors in a risk-free environment, improving retention and application of skills in real-world scenarios.

8. Competitive factors:

Incorporating an element of competition through leaderboards and timed challenges can encourage healthy competition among learners. This not only brings more fun, but also motivates individuals to perform better than others, leading to a sense of accomplishment.

9. Cost-effective training:

Although the initial investment in VR technology can be sometimes significant for many organizations, gamified VR training can be a cost-effective solution in the long run. It reduces the need for physical resources, travel, and on-site training, making it a scalable and efficient training method.

4. VR training efficiency

To the best of our knowledge, the most recent study on the efficiency of VR training in comparison with traditional learning methods is the PwC report from 2020 [6]. The summary of this extensive study and the most important learning efficiency parameters are presented in Figure 2 and the following:

Training speed: Employees completed VR training up to 4x faster than in-person training and up to 1.5x faster than e-learning.



Figure 2. Main VR training efficiency findings in comparison with the traditional learning methods. Source: PWC Study on Effectiveness of Virtual Reality Training in Enterprises, 2020

Improved confidence: Employees who received VR training were up to 275% more confident in applying the skills they learned, an increase of 40% compared to classroom learning and 35% compared to e-learning.

Emotional connection: VR learners felt 3.75 times more emotionally connected to content than classroom learners and 2.3 times more than e-learners.

Focus and commitment: Learners trained in VR were up to 4 times more focused than e-learning learners and 1.5 times more focused than their classmates.

As a conclusion from the study, it can be derived that VR skills training is more effective than traditional methods and can lead to increased confidence, emotional connection, and focus. Also, using VR for soft skills training is a more cost-effective and worthwhile investment than in-person instruction or e-learning. This report suggests that VR is poised for enterprise-scale use, as falling costs and advances in technology make it an increasingly viable option for effective training programs.

A review of the existing literature shows that the effectiveness of VR in learning and training has been previously studied. Table 1 provides an overview of various studies demonstrating mainly positive outcomes from integrating VR into learning and training contexts.

Table 1. Selected Previous VR Efficiency in Training Studies, Research Context and Findings

Title	Authors	Findings	Published In
The Effectiveness of Virtual Reality-Based Training in Emergency Obstetric Care: A Systematic Review [7]	Fornieris, S. G., et al.	Positive outcomes in training healthcare professionals in emergency obstetric care using VR.	Simulation in Healthcare, 2019
The Effect of Virtual Reality on Learning Outcomes in Health and Safety Training [8]	Gao, Z., et al.	VR positively impacted learning outcomes in health and safety training compared to traditional methods.	Journal of Science Education and Technology, 2019
A Meta-analysis of the Cognitive and Motivational Effects of Serious Games [9]	Wouters, P., et al.	Investigates the cognitive and motivational effects of serious games, including those implemented in virtual reality.	Journal of Educational Psychology, 2013

5. Impact of Labor and Skills Shortage and Talent Attraction

Uncover talent by immersing yourself into their social ecosystems: Prospective employees thrive where community converges

According to a 2021 report from the TechForce Foundation, the impending retirement of baby boomers, workforce mobility, turnover, and new job creation will increase the demand for more than 19,000 trauma technicians annually in the U.S. from 2021 to 2025. is expected to occur.

At the same time, the American Welding Society has highlighted worrying trends in the welding industry, predicting a shortage of approximately 400,000 welders by 2024. This compelling data strongly suggests that the shortage of skilled technicians is not just a short-term challenge, but a long-term problem that threatens to impact industry capabilities in the coming years.

To address this critical challenge in the world of work, virtual reality (VR) technology is proving to be a promising solution [10]. VR has the potential to increase engagement, accelerate upskilling, and facilitate remote and self-guided training. This technology represents an innovative approach to addressing the ongoing skills shortage and provides a scalable and innovative way to prepare the workforce for the demands of these specialities.

Given that individuals often succeed within their communities, the use of VR technology offers an innovative solution.

An effective approach is to create virtual gamification simulations that are carefully designed to replicate the challenges and dynamics of real-world work environments [10]. These simulations provide a comprehensive and immersive experience, giving potential candidates a glimpse into the complexities of real-world scenarios. Using this method, companies can effectively assess candidate skills and ensure a match between skills and job requirements. Additionally, collaborative VR experiences have great potential, especially when it comes to allowing young talent to connect remotely with peers, mentors, and industry experts. This makes it easier to expand the professional network, even in a virtual space, and fosters a sense of community. Through collaborative VR initiatives, companies are not only bridging geographic gaps, but creating environments that help share knowledge, mentor, and seamlessly integrate new talent into the professional world [11].

6. Conclusions

Proactive strategies such as immersion in social ecosystems and the integration of game-based simulations can proactively address pressing talent shortages and effectively bridge the growing gap between education and industry needs. It has proven to be an important method. Immersing in the social ecosystem represents a paradigm shift beyond traditional recruitment and leveraging the diverse and dynamic networks in which potential talent grows. This approach not only allows for a more holistic understanding of candidates, but also a community-focused approach to talent acquisition. At the same time, the incorporation of gamified simulation represents a breakthrough in training methods within virtual reality (VR), creating realistic and adaptable scenarios that reflect the complexity of real-world work environments. The gamified VR simulations improve the practical application of learned skills. This not only enriches the learning experience but also better prepares individuals for the challenges they will face in their careers and attract the future workforce.

Moreover, VR's role as a dynamic force goes beyond the immediate problem of talent shortages. This represents a fundamental shift in the entire skills development and talent acquisition landscape, and VR technology, with its immersive capabilities and versatility is

positioned as a catalyst for change in organizations. This transformation is marked by a shift to a more engaging, personalized, and experiential learning environment. By seamlessly combining immersive experiences with innovative learning methods, VR is a pioneering solution that not only bridges the immediate skills gap but also anticipates and adapts to the changing needs of the modern world.

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