Revolutionizing Leadership Training with Virtual Reality: Preparing Indonesia's Next-Gen Workforce through Startup Case Studies

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Abstract: *Along with the rapid development of the digital era, Indonesia needs leaders who are able to adapt and innovate to strengthen its competitiveness on the global stage. Unfortunately, traditional leadership training methods are now considered inadequate to meet the increasingly complex demands. This research focuses on exploring the use of Virtual Reality (VR) technology in leadership training by analyzing literature from various sources to identify the potential, benefits, and challenges that exist in the implementation of VR in this training. Using the library research method, this study examines in depth the literature's views on the effectiveness of VR as a training medium that offers a realistic and immersive simulated environment experience. The results showed that VR can assist trainees in honing critical leadership skills, such as sound decision-making, effective communication, and crisis management, under safe yet realistic conditions. Based on these findings, VR integration is recommended as one of the main approaches in leadership training programs in Indonesia to equip aspiring leaders with relevant skills in the digital era.*

Keywords: Virtual Reality (VR), Leadership Training, Digital Era, Indonesia, Adaptive Leadership Skills

INTRODUCTION

In an era of globalization and digital development that is full of uncertainty, the business world faces rapid change and is difficult to predict. New technologies are constantly evolving, making traditional business models less relevant amidst these dynamics. To survive and compete in the global market, Indonesia needs leaders who are able to adapt, innovate, and think critically in the face of complex challenges. Today's leaders are expected to have the ability to make quick decisions, manage crises, and innovate in various situations. In response to this need, Virtual Reality (VR) technology is a promising training method to shape leadership skills that are relevant to today's global demands.

VR technology is gaining importance in leadership training due to its ability to create simulated environments that closely resemble real conditions (Baroroh and Agarwal 2022). The technology has been successfully used in various sectors, including medicine and the military, demonstrating its effectiveness in simulating complex situations that are difficult to achieve through traditional training. In the medical field, VR allows health professionals to practice skills in complicated surgical scenarios without direct risk to patients. Likewise, in the military, VR is used for simulating crisis situations and battle drills, allowing soldiers to practice responses in high-risk conditions without any real physical threat. This kind of simulation experience helps participants to practice decision-making skills under pressure, which is an important quality for a leader (Lampropoulos and Kinshuk 2024).

VR's ability to create realistic experiences makes it a potential training method for

developing leadership skills, such as decision-making, effective communication, and crisis management (Alcañiz, Parra, and Giglioli 2018). This research aims to explore the use of VR in leadership training in Indonesia, especially [88] in the challenging and dynamic startup sector. Startups in Indonesia are part of the growing digital economy, so there is a high need for responsive and creative leaders. In this case, VR is considered to be able to overcome the limitations of traditional training methods that are less interactive and often cannot reflect complex and stressful business situations.

Furthermore, the application of VR in leadership training can provide a more in-depth and immersive learning experience for aspiring leaders in Indonesia. Through VR, participants can hone skills in a safe yet reality-like environment, allowing them to practice leadership abilities without any immediate risk (Sosial 2024). Therefore, this research underscores the importance of applying VR technology in leadership training as a step to increase the effectiveness of training programs and prepare a generation of Indonesian leaders who are ready to compete at the global level. Through VR, it is hoped that future leaders will get a realistic experience that can help them deal with complex situations in the ever-evolving business world (Cortellazzo, Bruni, and Zampieri 2019).

METHODOLOGY

This study used a library research approach by collecting information from relevant academic articles, journals, books, and online sources. Literature sources were selected based on relevance to the topic of leadership training using VR, publications within the last five years, and the quality and credibility of the sources used. The analysis process was conducted qualitatively with content analysis techniques, to identify patterns, similarities, and differences in the application of VR in leadership training. This approach allows researchers to explore a deeper understanding of the impact of VR on leadership skills in the startup sector, as well as the challenges and opportunities that exist.

RESULTS

A. Utilization of VR in Leadership Development

The utilization of Virtual Reality (VR) technology in leadership training has brought significant changes in the way companies prepare future leaders, especially in the increasingly dynamic business world. VR offers a much more immersive and immersive training experience compared to traditional training methods, which are often limited to theory teaching or classroom discussions (Sebastian Salim and Ivander 2024). In the context of leadership, the ability to lead a team, make quick decisions, and deal with crisis or conflict are key competencies that a leader must have. VR technology provides an opportunity for trainees to interact in simulations of real situations that they may face in the working world (Multidisiplin et al. 2023). Through this experience, they not only learn from theory, but also from challenging hands-on experience, helping them to hone their skills under conditions of uncertainty and pressure.

One of the key advantages of VR-based training is its ability to present experiences that demand fast and accurate decision-making, complex problem-solving, and team management in stressful situations (Hutajulu, Eliyana, and Susita 2021). In specially designed simulations,

participants are trained to deal with crises or major changes that affect their business. They learn to make decisions with limited information and in limited time, which is particularly relevant in the context of the startup world, where markets often change dynamically and leaders must be ready to adapt quickly. In addition, VR allows for a broader simulation of team relationship management and how to lead in stressful situations, both involving technical and emotional aspects (Triono et al. 2024).

With the VR approach, trainees can gain practical experience in overcoming real- world challenges (et al. 2021). This training not only provides an understanding of leadership theories, but also provides direct consequences of every decision made, deepening their understanding of the importance of the right decision and its impact on the team and the company.

B. Virtual Reality Hardware and Software for Leadership Training

Virtual Reality (VR) is an advanced technology that allows users to experience a fully immersive virtual world, as if they were in a real situation created by a computer. In the context of leadership training, VR offers an opportunity for leaders or aspiring leaders to practice in a safe yet highly realistic environment. With VR, leadership simulations can create real-world scenarios where leaders can hone their skills in the face of complex challenges. Here is a detailed explanation of the hardware and software used, as well as how VR works in leadership training.

1. **Hardware in Virtual Reality**

   Hardware is a critical component of the VR experience that allows users to interact with the virtual world realistically. A variety of hardware is used in leadership training to support the experience, including:

   - **VR Headset,** A VR headset is the primary device used to present immersive experiences of virtual worlds. Equipped with 3D screens and motion sensors, these headsets allow users to view and interact with virtual environments in real time. For example, headsets such as Oculus Rift, HTC Vive, and PlayStation VR provide a three-dimensional view and track users' head movements, thus creating the illusion that they are actually in a virtual world.
   - **Motion Controllers,** To interact with elements of the virtual world, users use hand controllers that allow them to perform actions such as leading meetings, giving instructions, or negotiating. These controllers track hand movements or touch to provide a more intuitive and natural experience in leadership training.
   - **Computer or Console,** A computer or console that has high processing power is essential for running VR software. Powerful graphics specifications (such as NVIDIA GeForce GPU) are required to ensure the VR simulation runs smoothly without interruption. These devices support the visualization of complex virtual worlds with realistic graphics, allowing participants to have a more immersive experience.

2. **Software in VR**

   VR software is the part that connects the virtual world with the training scenario. In leadership training, the software is designed to simulate real-world situations that a leader might face. Some of the main software features used in VR training are as follows:

- **Simulating Real World Scenarios,** VR software can create simulations that closely resemble real situations in a leader's life. Simulated scenarios can include a variety of situations, such as leading a meeting, overcoming an organizational crisis, or making strategic decisions. Using VR, aspiring leaders can practice solving such challenges in a fully controlled environment.
- **Interactivity and Feedback,** One of the biggest advantages of VR is its ability to provide immediate interactivity and feedback. Users can interact with elements within the virtual world, and the software will provide responses based on the actions they take. In leadership training, this is particularly important as it allows participants to see the impact of their decisions and correct their approach in real time.
- **Performance Tracking and Analysis,** Many VR software comes with tracking features that allow trainers to monitor and analyze participants' performance. By monitoring the decisions they make, their reactions to certain situations, and the way they adapt to changes, trainers can provide more specific and relevant feedback and help participants understand the areas they need to develop further.

3. **Types of VR in Leadership Training**

   There are several types of VR used in leadership training, with different approaches according to the objectives and skills to be trained:

   - **Immersive VR with Headset (Fully Immersive VR),** In this type of VR, users are fully immersed in a virtual world using a headset equipped with motion sensors. The experience is highly immersive, allowing participants to experience first-hand sensations in a virtual world, such as leading an important meeting or negotiating under stressful conditions. This type of VR is particularly effective for training that requires direct physical interaction with the environment, providing a more intense and realistic training experience.
   - **Non-Immersive VR (Computer-Based),** Unlike VR with a headset, non- immersive VR uses a computer monitor or screen as a window to the virtual world. Users can interact with the simulation through controllers or other input devices. Although this experience is not fully immersive, computer-based VR still provides significant benefits in leadership training, especially for scenarios that focus on decision analysis or data-driven simulations.

4. **Simulation Development for Leadership**

   Training The VR simulations used in leadership training are designed with great care to create a relevant and rewarding learning experience. Here are the key steps in creating a simulation:

   - **Scenario Design,** VR designers create scenarios based on real leadership challenges. This scenario can include a variety of situations, such as facing financial problems, overcoming conflicts between teams, or planning major changes in the organization. Each simulation is tailored to the training objectives to be achieved, such as honing decision-making skills or improving communication skills.

- **Interactivity in Simulation,** VR simulation is not only about visualizing the virtual world, but also about active interaction. Participants can talk to virtual characters, make decisions, and see the consequences of their actions. This creates a more dynamic and immersive experience, so participants can learn in a more engaging and responsive way.
- **Feedback and Evaluation,** Once the simulation is complete, participants will receive immediate feedback on the decisions they have made. The system will provide an evaluation based on their performance, including an analysis of strengths and weaknesses in decision-making, as well as suggestions for improvement. This way, participants can continue to develop and improve their leadership skills to face greater challenges in the real world.

C. The Effectiveness of VR Based on Research

Existing research shows that the use of VR in leadership training is very effective in improving participants' decision-making abilities and emotional resilience (Sofia et al. 2020). A study conducted shows that trainees who use VR can make decisions faster and more precisely compared to those who use traditional methods. In crisis situations, participants are proven to be able to process limited information more quickly, as well as act more decisively and measurably, which is a vital skill in leadership.

In addition, VR has also been shown to increase participants' emotional resilience. Emotional resilience is the ability of a leader to remain calm, rational, and effective in stressful situations or when facing uncertainty. In the VR simulation, participants can directly feel the emotional impact of the decisions they make, which teaches them to manage stress, anxiety, and other emotions in the face of challenging situations. Research shows that VR-based training is more effective in training emotional resilience than traditional training, which tends to rely solely on theory and discussion.

VR can also strengthen participants' communication skills, both in the decision-making process and conflict management. One of the great advantages of VR is its ability to simulate team interactions in a variety of challenging scenarios, allowing participants to practice their communication skills in highly stressful situations. Effective communication is a crucial aspect of leadership, especially when managing diverse teams or interacting with various external parties. Therefore, VR-based training provides an opportunity to practice communication skills in real-world contexts that are often fraught with tension and challenges.

D. Advantages of VR Over Conventional Training Methods

One of the main advantages of VR-based training is the much higher level of engagement and interactivity compared to conventional training methods (Syafiq 2024). In traditional training, participants are often passive listeners who receive information from the instructor or the material presented. In contrast, VR-based training creates an active experience that allows participants to directly engage in simulated real-world situations, influence the outcome of the scenario at hand, and learn from the impact of the decisions they make. With a more immersive experience, participants not only learn theory but also test their skills in situations that require

quick decision making, team management, and hands-on problem solving.

VR-based training also allows the creation of more complex and diverse scenarios. VR can simulate profound changes in the market, international crises, or internal conflicts within teams that require collaboration and quick decisions. In these simulations, participants are tested in strategic decision-making that requires them to provide the right response in a short period of time. Unlike traditional training that relies more on case studies or theoretical discussions, VR provides practical experiences that allow participants to learn from hands- on experience.

In addition, VR is able to overcome the limitations of conventional training in developing emotional and psychological skills that are important in leadership. In VR simulations, participants can experience first-hand the pressure and stress that comes with making big decisions, as well as learn how to manage the emotional impact of those decisions. VR-based training is particularly valuable because the business world often demands decision-making in uncertain and stressful situations. Therefore, the experience provided by VR can help participants better prepare for similar situations in the future.

E. Challenges of VR Implementation in Indonesia

While the benefits of VR-based training are clear, its implementation in Indonesia, particularly among startups, still faces several challenges. One of the main barriers is the cost associated with the hardware and infrastructure needed to support this technology (Parra et al. 2021). Despite the increasingly affordable price of VR devices, many startups in Indonesia still have limited budgets and cannot allocate funds to purchase VR hardware or build the necessary infrastructure.

In addition, resistance to new technology is a considerable problem. Many companies, especially the more traditional ones, may feel skeptical of the effectiveness of VR-based training and doubt whether the investment will deliver results worth the cost. Therefore, more in-depth education and socialization about the benefits and evidence of successful VR implementation in other companies is needed. A better understanding of the huge potential of VR can convince decision makers to invest in this technology and believe in the positive impact it can have.

The limited infrastructure in Indonesia, especially in undeveloped areas, is also a major challenge in the implementation of VR. Access to high-tech and stable internet is still a significant problem. For this reason, cooperation between the government and the private sector is needed to improve digital infrastructure throughout Indonesia, especially in areas that are not yet covered by high-speed internet. With adequate infrastructure, VR technology can be accessed by more companies, especially startups outside big cities.

In addition, the development of VR training modules that are more affordable and accessible is also key to accelerating the adoption of this technology. With the presence of more practical, cost-effective, and easy-to-implement training modules, more companies, especially those with limited resources, can utilize VR to improve leadership skills for future leaders.

F. Special Case Study: VR Implementation by a Startup in Indonesia for Leadership Training

The use of Virtual Reality (VR) technology is now growing in the world of leadership training, especially for a number of Indonesian startups who are looking for effective and

efficient ways to hone the skills of future leaders. Some of these startups have integrated VR in training programs to improve technical and social skills that are important in leadership (KLEIN 2020).

For example, the startup Millealab uses VR to create simulations of complex work scenarios, so that participants can experience a work environment that is close to real conditions. Thus, the participants can practice decision-making in stressful situations without any real risks. In addition, Primeskills applies VR to practice communication and teamwork skills through the simulation of interpersonal situations that require in-depth problem-solving skills.

The success of these startups in leveraging VR demonstrates the superiority of technology in providing a more immersive and interactive training experience—something that is difficult to obtain through traditional training methods. However, several challenges such as high device costs and limited access in some regions of Indonesia have become obstacles in the wider application of VR. Therefore, collaboration is needed between the private sector and the government so that the adoption of VR in training can be more evenly distributed in Indonesia, as well as support human resource development through technology-based training.

With real examples of startups in Indonesia, this article further emphasizes the relevance of VR in leadership training in Indonesia. The experience of these startups shows that despite some challenges, VR has great potential in supporting the development of leadership skills that are relevant to the needs of the industry today.

CONCLUSIONS

This research confirms that Virtual Reality (VR) technology has great potential to revolutionize leadership training in Indonesia, especially in the rapidly growing startup sector in the digital era. Based on an in-depth library research approach, it was found that VR is able to deliver a more immersive and effective training experience compared to conventional methods that are generally limited to theory and classroom discussions. VR provides opportunities for trainees to experience simulated real-world situations that are challenging and stressful, allowing them to hone leadership skills such as quick decision-making, crisis management, and effective communication within a team.

The main advantage of VR-based training is its ability to present practical experiences that force participants to make decisions under limited and stressful conditions, which closely resemble the challenges faced by leaders in the real world. Research also reveals that VR can increase participants' emotional resilience, help them manage stress and anxiety in difficult situations, and improve communication skills that are needed for effective leadership. In the dynamic and changing context of startups, these skills are becoming increasingly important to ensure success and competitiveness in the global market.

While the use of VR in leadership training brings significant benefits, its implementation in Indonesia, especially in the startup sector, still faces several challenges. The cost of hardware and infrastructure required to support VR technology is a major barrier, especially for companies with limited budgets. In addition, resistance to new technology and limited digital infrastructure in some regions hinder the adoption of this technology. Therefore, collaboration between the

government, private sector, and industry players is needed to increase understanding, expand access to digital infrastructure, and provide more affordable and practical VR training modules.

Overall, VR offers an innovative and effective approach to leadership skills development in Indonesia. Therefore, it is highly recommended to integrate VR in leadership training programs, given its ability to provide realistic and challenging simulations. With wider utilization of VR, Indonesia can prepare future leaders who are adaptive, creative, and ready to face increasingly complex global challenges.

REFERENCES

Alcañiz, Mariano, Elena Parra, and Irene Alice Chicchi Giglioli. 2018. "Virtual Reality as an Emerging Methodology for Leadership Assessment and Training." *Frontiers in Psychology* 9 (SEP): 1–7. https://doi.org/10.3389/fpsyg.2018.01658.

Baroroh, Dawi Karomati, and Aanchal Agarwal. 2022. "Immersive Technologies in Indonesia Faces 'New Normal' COVID-19." *International Journal of Technology* 13 (3): 633–42. https://doi.org/10.14716/ijtech.v13i3.5220.

Cortellazzo, Laura, Elena Bruni, and Rita Zampieri. 2019. "The Role of Leadership in a Digitalized World: A Review." *Frontiers in Psychology* 10 (AUG): 1–21. https://doi.org/10.3389/fpsyg.2019.01938.

Hutajulu, Richard Surungan, Anis Eliyana, and Dewi Susita. 2021. "The Effect of Digitalization and Virtual Leadership on Organizational Innovation During the COVID-19 Pandemic Crisis: A Case Study in Indonesia." *Anis ELIYANA / Journal of Asian Finance* 8 (10): 57–0064. https://doi.org/10.13106/jafeb.2021.vol8.no10.0057.

KLEIN, Müge. 2020. "Leadership Characteristics in the Era of Digital Transformation." *Business & Management Studies: An International Journal* 8 (1): 883–902. https://doi.org/10.15295/bmij.v8i1.1441.

Lampropoulos, Georgios, and Kinshuk. 2024. *Virtual Reality and Gamification in Education: A Systematic Review*. *Educational Technology Research and Development*. Vol. 72. Springer US. https://doi.org/10.1007/s11423-024-10351-3.

Multidisiplin, Jurnal Ilmiah, Mohammad Afrizal Miradji, Indah Sri Wahyuni, Nabila Maulidya Putri, Binti Wulandari, Aisyah Devi Irawati, and Rahmad Fardiamsyah. 2023. "Vol.+1,+No.+2+Desember+2023,+Hal.+279-287.." 1 (2): 279–87.

Parra, Elena, Irene Alice Chicchi Giglioli, Jestine Philip, Lucia Amalia Carrasco-Ribelles, Javier Marín-Morales, and Mariano Alcañiz Raya. 2021. "Combining Virtual Reality and Organizational Neuroscience for Leadership Assessment." *Applied Sciences (Switzerland)* 11 (13). https://doi.org/10.3390/app11135956.

Jihan Sabilah, Silvania Nurfandi Riyanti, and Nopriadi Saputra. 2021. "Kesiapan Kerja Generasi Milenial Di DKI Jakarta Raya: Pengaruh Kecerdasan Emosional Dan Keterampilan Digital." *Jurnal Akuntansi, Keuangan, Dan Manajemen* 2 (3): 225–42. https://doi.org/10.35912/jakman.v2i3.379.

Sebastian Salim, Brian, and Filbert Ivander. 2024. "Integrasi Realitas Virtual Dalam Pelatihan Pengembangan Teknis." *Jurnal Review Pendidikan Dan Pengajaran* Vol 7 No 2: 4256–63.

http://journal.universitaspahlawan.ac.id/index.php/jrpp.

Sofia, Lisda, Maulidya Shalzabila Indah, Arina Sabila, Stefanny Ayu, and Danny Mulyanto. 2020. “JURNAL PLAKAT Jurnal Pelayanan Kepada Masyarakat PELATIHAN KOMUNIKASI INTERPERSONAL UNTUK KOMUNIKASI EFEKTIF.” *PLAKAT: Jurnal Pelayanan Kepada Masyarakat* 2 (1): 72–80. www.hukumonline.com.

Sosial, Jurnal Ilmu. 2024. “PERAN KEPEMIMPINAN DEMOKRATIS TERHADAP KETERLIBATAN KARYAWAN DI ERA DIGITAL Yuni Antika, Dhesta Adhellya Santika, Natasya Alvionita, Dina Lestari Jurusan Adminsitrasi Publik, Fakultas Ilmu Sosial Dan Ilmu Politik Universitas Sriwijaya” 5 (1): 1–10.

Syafiq, Muhammad. 2024. “Public Studies and Business Administration Journal (PUSBA) Training and Learning Approaches” 1 (1): 32–38.

Triono, Sunu Puguh Hayu, Agus Rahayu, Lili Adi Wibowo, and Andry Alamsyah. 2024. “The Impact of Entrepreneurial Strategy on the Firm Performance of Indonesian Technology Startups.” *Jurnal Manajemen Indonesia* 24 (1): 84. https://doi.org/10.25124/jmi.v24i1.7303.