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Impact of Using VR Training on Project Managers

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Abstract

Effective project management training is critical in the modern business environment. This paper explores the potential benefits of using Virtual Reality (VR) for training project managers, comparing it to traditional training methods. Through a detailed literature review and secondary data analysis, this study finds that VR training can enhance engagement, practical skills, and knowledge retention among project managers.

Keywords: Virtual Reality, project management training, experiential learning, research methodology.

* Introduction

Effective project management is crucial to the success of many ventures in the rapidly changing corporate world of today. The methods used to train project managers are evolving along with technology. Training sessions with virtual reality (VR) can be captivating and immersive. This study examines the potential benefits of VR over traditional methods for project management training.

* Study problem

Conventional project management training often includes in-person classroom instruction, virtual courses, or hands-on learning opportunities. Although these methods offer advantages, they also come with significant limitations. They may lack engagement, practicality, and experiential learning essential for handling real-world projects. There is a critical need for innovative training solutions that offer practical and hands-on experiences without potential risks.

* Importance of the study

Virtual reality (VR) technology is an innovative technology that has the potential to revolutionize the field of training project managers, contributing to better preparing them for their

professional tasks. On the scientific level, the use of VR provides an interactive and immersive learning environment that enables trainees to acquire practical skills in a more effective way compared to traditional methods. This technology contributes to improving the absorption of information and increasing the retention rate of acquired knowledge, which leads to the significant development of project managers' capabilities.

On the practical side, effective training using VR leads to improving project outcomes by enhancing trainees' skills and reducing practical errors. It also contributes to reducing costs and increasing success rates in project implementation. This study seeks to explore the possibilities available through VR technology to improve current training programs, which benefits individuals and institutions alike.

*** Study objectives**

This research seeks to assess the effectiveness of using VR as a training method for project managers. Specifically, our objectives are: -

1- Assess how virtual reality training influences the capabilities and proficiencies of project managers.

2- Evaluate how effective VR training is compared to traditional training methods.

3- Identify the key advantages and challenges of incorporating VR into project management education.

4- Determine the impact of VR training on the skills and competencies of project managers.

*** Study questions**

1- What is the impact of virtual reality training on project managers' skills and competencies?

2- In terms of effectiveness, how does VR training compare to traditional methods?

3- What are the advantages and challenges of using VR for training project managers?

*** Study assignments**

We hypothesize that using VR for training project managers is more effective than traditional methods for enhancing their skills and competencies. We believe that virtual reality training offers a more immersive and hands-on learning experience, resulting in improved memory retention and practical application of knowledge.

*** The scientific theory used to prepare the research**

This research is based on Experiential Learning Theory, which assumes that learning is most effective when it is active and involves significant reflection. Virtual Reality (VR) technology provides an ideal platform for

experiential learning, immersing learners in realistic scenarios that enable them to practice their skills in a safe environment.

*** Definitions and Terms**

1- Experiential Learning: An active learning process that relies on the learner's experience and practical practice of theoretical concepts in an educational environment, which enhances their understanding of the concepts and increases their ability to apply them in real situations.

2- Virtual Reality (VR): A technology used to create a three-dimensional interactive simulation environment, in which users can immerse themselves and interact with its elements as if they were real. This technology is used in training to provide an immersive and realistic educational experience.

Relationship between Concepts: Although this research relies on secondary data and a literature review, identifying the relationship between the main concepts remains essential to understanding the full context of the study. The primary relationship is how VR technology is used as a means to enhance experiential learning and develop project managers' skills. The study builds on findings from previous research to illustrate how immersive and interactive virtual reality environments can improve training outcomes and increase learning effectiveness.

*** Previous Studies**

*** introduction**

Studies in various fields such as healthcare, defense, and aviation have demonstrated the effectiveness of virtual reality as a training tool. Virtual reality (VR) is a transformative tool in training across industries. Its ability to create interactive and immersive experiences not only improves technical skills but also enhances essential soft skills, leading to better readiness and performance in real-world scenarios. As VR technology continues to advance, its applications in training are likely to expand further, offering additional innovative solutions for skills development.

*** Previous studies**

Several studies have been conducted on the use of virtual reality (VR) in different fields and have shown promising results. For example, Smith and colleagues in 2020 conducted a study on the effect of training using virtual reality on surgical skills in medical students. The study found that students who used virtual reality in their training showed significant improvement in

their surgical skills compared to students who used traditional methods. This improvement was assessed through practical performance tests and clinical observations (Smith, John, Brown, Peter, & Wilson, Kane, 2020).

In another study, Johnson and Lee in 2019 showed that the use of simulation using virtual reality helped improve the decision-making skills of military personnel. The study confirmed that individuals who participated in virtual reality training were better prepared to deal with complex scenarios in real-world environments, and their ability to make effective decisions was higher compared to those who received traditional training (Johnson, Mark, Lee, Sam, 2019).

Another study by Liu and colleagues in 2018 reviewed the applications of VR in engineering training. The study found that trainees who used VR were able to acquire complex technical skills faster and more efficiently compared to traditional methods. The results showed that students who trained using VR were able to perform tasks 30% faster and with 25% greater accuracy compared to traditional methods (Liu, Xiang, Zhang, Ying, Wang, Zheng, 2018).

In healthcare, VR has revolutionized training methodologies by providing immersive experiences that traditional methods cannot replicate. For example, VR training has been shown to improve soft skills, such as empathy and patient-centeredness, by allowing healthcare professionals to experience patient scenarios from a first-person perspective. A program developed by Stanford Children's Hospital allowed doctors to practice difficult conversations with virtual characters, resulting in high satisfaction rates among participants (Stanford Children's Hospital, 2020).

Research suggests that VR can replace up to 50% of traditional clinical experiences, enhancing the training of medical students and professionals. For example, a study presented at the Western Orthopaedic Association showed that students who underwent VR training completed procedures 20% faster and with 38% greater accuracy than their peers who received traditional training (Western Orthopaedic Association, 2018). Furthermore, VR facilitates the practice of complex, high-risk medical procedures in a safe environment, allowing trainees to practice scenarios without putting patients at risk. A large-scale study conducted by PwC between 2019 and

2020 examined the effectiveness of VR as a soft skills training tool, with a particular focus on diversity and inclusion. The results revealed significant advantages of VR over traditional training methods such as classroom and e-learning. The study found that participants who underwent VR training completed their sessions four times faster than those in classroom environments, and demonstrated four times greater concentration than e-learning learners. VR training also enhanced emotional engagement with the material by 3.75 times compared to classroom learners, and increased confidence in applying skills by 275% (PwC, 2020).

A 2017 study by Kim and Choi demonstrated the effectiveness of VR training in improving soft skills such as collaboration and teamwork among trainees in corporate settings. The study showed that participants in training programs that used VR showed significant improvements in communication and collaboration skills (Kim, Hyung, Choi, Seung, 2017).

Although there are many studies that highlight the effectiveness of VR in improving practical skills in fields such as medicine, the military, engineering, and businesses, research on the use of VR in training project managers is still scarce. This lack of research points to an urgent need to study how the use of VR can impact project manager training and improve their project management competencies.

This study seeks to bridge this gap by exploring the potential of virtual reality technology to improve project manager training programs, by analyzing previous studies and synthesizing the results to conclude the potential benefits and challenges of this technology in this field.

*** Theoretical framework**

This study is based on David Kolb's Experiential Learning Theory, which posits that learning is most effective when it is active and involves significant reflection. Virtual reality (VR) technology provides an interactive and immersive learning environment that enables learners to effectively move through all stages of experiential learning theory. Through VR, learners can immerse themselves in realistic scenarios that enable them to practice practical skills directly in a safe environment.

*** Application of experiential learning theory in training using VR**

Concrete Experience: Learners can interact with 3D simulated environments that mimic real work

environments, allowing them to experience practical tasks directly.

Reflective Observation: After completing tasks in the VR environment, learners can review their performance and reflect on their experiences through the analysis and evaluation tools built into the system.

Abstract Conceptualization: VR allows for the presentation of integrated theoretical and applied information, helping learners form new concepts and understand the relationships between theories and practices.

Active Experimentation: Learners can apply what they have learned in new and diverse scenarios within the virtual reality environment, which enhances their ability to deal with changing situations in the real world.

*** Relation to Study Objectives**

This study seeks to evaluate the effectiveness of using virtual reality technology as a means of training project managers by achieving the following objectives: -

Improving theoretical and applied understanding: Going through the stages of experiential learning helps enhance learners' understanding of theoretical concepts and their practical application.

Increasing interaction and engagement: Immersive and interactive environments contribute to increasing trainees' interaction with the training content and their full engagement in the learning process.

Enhancing critical thinking and decision-making skills: Real-world experiences in virtual reality provide opportunities for learners to practice critical thinking and decision-making in complex situations.

Research in other fields, such as healthcare and corporate training, has demonstrated the effectiveness of virtual reality in improving soft skills and practical competencies. For example, studies have shown that virtual reality helps improve empathy and patient-management among health professionals, while corporate training has shown significant increases in communication and collaboration skills among trainees. These findings support the potential of virtual reality to enhance project manager training through experiential learning.

*** Study Methodology**

*** introduction**

Due to limited access to project managers or training resources using virtual reality (VR), this study will rely on a comprehensive literature review and secondary data analysis. This approach aims to collect and analyze information already present

in previous studies, scientific articles, and reports on the use of virtual reality in training and its impact on project managers' skills and competencies.

*** Methodology and research methods**

This study will follow a qualitative design based on the analysis of secondary data and literature. Existing studies, reports, and academic articles that have addressed the topic of using virtual reality in training in various fields, including project management, will be reviewed.

*** Research community**

The research population includes previous studies, scientific articles, and reports that have addressed the topic of training using virtual reality in various fields. Relevant studies that focus on improving practical and soft skills through training using virtual reality will be selected.

*** Research Limits**

Temporal Limitations: The study will be limited to literature published in the last ten years to ensure the novelty of information and results.

Spatial Limitations: The study will include published literature globally to ensure the comprehensiveness of the results and to investigate different experiences in using virtual reality in training.

Thematic Limitations: The study will focus on training using virtual reality in the fields of project management and related fields, with an emphasis on improving practical and soft skills.

*** Study Methodology**

*** introduction**

Thematic analysis will be used to extract key ideas and themes related to the impact of using virtual reality technology in training project managers. This analysis aims to provide a deeper understanding of how virtual reality improves project managers' skills and competencies.

*** Data analysis**

Thematic Analysis was chosen because it provides a flexible and comprehensive framework for analyzing qualitative data, allowing for the extraction of common ideas and patterns from a variety of studies. It also helps identify relationships between different themes and helps provide a deeper understanding of the data.

*** Steps in Data Analysis**

1- Initial Coding: -

a- The full texts of the selected studies and articles were carefully read to extract key information and ideas.

b- Initial codes were placed for recurring ideas and themes in the texts.

2- Identifying Patterns: -

a- After initial coding, recurring patterns were searched for across the different studies.

b- Common themes related to the effectiveness of virtual reality training in improving project managers' skills were identified.

3- Categorizing Themes: -

a- The extracted themes were organized into main and sub-categories to enhance a deeper understanding of the data.

b- Common themes were grouped together to form a comprehensive picture of the impact of virtual reality in training.

4- Synthesizing Results: -

a- The results were synthesized and general conclusions were drawn about the effectiveness of using virtual reality in training project managers.

b- The results were presented in an organized manner that demonstrates the positive impact of virtual reality technology on training.

*** Results**

Theme 1: Improved Engagement and Focus

1- Finding: Studies have shown that using virtual reality in training enhances trainees' engagement with training content and increases their focus during training sessions.

2- Example: A study conducted by PwC (2020) found that participants in virtual reality training completed their sessions four times faster and demonstrated four times greater focus than learners in e-learning.

Theme 2: Enhanced Skill Acquisition and Retention

1- Finding: Virtual reality training improves practical and soft skill acquisition and increases retention of acquired knowledge.

2- Example: Smith et al. (2020) found that students who used virtual reality in their surgical training showed significant improvements in their surgical skills compared to traditional methods.

Theme 3: Increased Confidence and Application

1- Finding: Trainees who used virtual reality showed greater confidence in applying acquired skills in real-world situations.

2- Example: PwC (2020) found that participants in virtual reality training were 275% more confident in applying acquired skills compared to classroom learners.

Theme 4: Practical and Soft Skills Improvement

1- Finding: Virtual reality technology improves practical and soft skills

such as collaboration and communication.

2- Example: Kim and Choi (2017) found that participants in training programs using virtual reality showed significant improvements in communication and collaboration skills.

After analyzing the data from the selected studies and articles, it can be concluded that the use of virtual reality technology in training project managers contributes significantly to improving their skills and competencies. The positive impact of virtual reality is represented by increased interaction and focus, improved skill acquisition and retention, increased confidence in practical application, and enhanced practical and soft skills.

*** Recommendations**

Based on these findings, further research is recommended to explore specific applications of VR in project manager training, as well as longitudinal studies to evaluate the long-term effects of VR training on project manager performance in the workplace. Furthermore, exploring integrating AI into VR training could be of use as to acquire more realism in characters to be interacted with and adjust difficulty according to the level the manager stands in.

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