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# Digital Healthcare Innovation A Framework For The Study Of The Effect Of Ar & Vr In Medical Treatment

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## Abstract

Virtual Reality (VR) is the simulation experience that creates a virtual user environment. Augmented Reality (AR) integrates real-life experience into a computer by adding sounds, graphics, or other features which is an overlay of the tech on top of the real-world environment.

The research questions of the study include What is the effect of Virtual Reality (VR) and augmented Reality (AR) on healthcare? And what is the difference between traditional simulation of treatment and Virtual Reality (VR) and augmented Reality (AR) in healthcare? The methods of data will be employed in the study will include the use of these survey questions. The method of data analysis employed in the study uses both qualitative and quantitative analysis. Excel will be used to find the significant level of Virtual Reality (VR) and augmented Reality (AR) in healthcare. The Time constraints and errors during data collection are some of the study's limitations.

**Keywords:** Digital Healthcare Innovation: Virtual Reality (VR) and augmented Reality (AR) in healthcare.

## Introduction:

Virtual Reality (VR) is a stimulating experience that creates a virtual user environment. Then Augmented Reality (AR) integrates the real-life experience into a computer by adding sounds, graphics, or other features (Ayoub & Pulijala. (2019). Virtual Reality (VR) and augmented Reality (AR) are significant technologies in healthcare because they enable healthcare providers to interpret data accurately when attending to the patient (Zhan et al., 2020). Virtual Reality (VR) and augmented Reality (AR) help medical students practice treating the body before trying to patients. The technology also helps medical practitioners to carry out experiments (Lakhani et al., (2020). The technology can create the virtual human body using the computer, which displays critical human body parts. Therefore, technology can improve healthcare provision because it enables full examination of the human body by medical practitioners and medical students. Technology can also examine how to treat the complex diseases that affect human beings (Bergin, 2018). This is because this technology

displays the features of the human being on the computer. The technology can also help the patient to describe the disorder they are suffering from because it makes them better understand the different disorders and how they can affect those (Xiong et al., 2021). The study is critical because it will enable people to understand the importance of digital information in improving healthcare services.

### **Literature Review:**

According to the study by Jag & Gupta, 2021), Augmented Reality (AR) is essential to aid researchers in identifying critical information by using special glasses to improve the visualization of some features. Augmented Reality modifies the real world, enabling researchers to identify important information in healthcare. Mohamudally (2018) examined the importance of Virtual Reality (VR) & Augmented Reality (AR) in healthcare. The study explains this technology involves creativity to develop features that can help medical practitioners improve their services using technology. The study also states that this technology is made accessible through smartphones and computers that healthcare providers can easily use to advance the healthcare services they provide to patients. The study also states this technology involves using s complex algorithms to integrate the experiences from the real world into the computer. The study states that healthcare providers must examine how they utilize this technology in providing healthcare services. McCarthy & Support (2019) studied the importance of Virtual Reality (VR) & Augmented Reality (AR) in healthcare education. The study revealed that the use of 3D has been significant in the improvement of healthcare. The study identifies that using a projection-based AR system can help visualize the veins in the body, improving the analysis. The study identifies that researching important information through technology helps enrich academic sources such as textbooks. The study by Pillai & Mathew, 2019) focuses on the important application of Virtual Reality (VR) in healthcare. The study revealed that technology had been commonly used for games. Currently, the technology is significant to be used in healthcare because it creates the visual world, which aids the healthcare providers to practice as if they are performing in real life. In the study, Virtual Reality (VR) involves creating a virtual world that doesn't exist but makes the users experience it as if they are in real life. Kuhn et al. (2018) studied the importance of Augmented/Virtual Reality (AR/VR) and robots in a study in medical schools. The study identifies an increase in this technology in medical practices to provide important information about health practices. The study revealed that the application of this intervention in medication is significant because it aids in the provision of effective medicines.

### **Research Question:**

1. Can virtual reality (VR) and augmented Reality (AR) be used to improve in treatment of chronic diseases in the United States?

## Hypotheses

Virtual reality (VR) and augmented Reality (AR) can positively lead to the efficient treatment of chronic disease in the United States because it improves the visualization of disorder

## Methods/Methodology

The methods of data will be employed in the study will include the use of survey questions. The study participants will include healthcare providers, nurses, and doctors (Rosellini & Brown, 2021). Fifty participants will be selected from various healthcare centers to assess the effects of Augmented/Virtual Reality (AR/VR) on providing healthcare knowledge to practitioners (Bergin, 2018). Ethics will be considered in the study (Arifin, 2018). Ethical considerations will include considering the participants' confidentiality, and informed consent will be given to the participants. The method of data analysis that will be employed in the study will include the use of both qualitative and quantitative analysis. The qualitative analysis will include analyzing the response texts from the participants. The quantities analysis will; include determining the significance level of Augmented/Virtual Reality (AR/VR) in healthcare services using SPSS (Kolbe et al., 2021). The number of participants who support and oppose the effectiveness of Augmented/Virtual Reality (AR/VR) in healthcare will be compared.

The study will take place in the sampled hospital in the United States. The states from which the sample will be obtained will include California, Chicago, and Philadelphia to assess the impact of employing Virtual Reality (VR) & Augmented Reality (AR) in healthcare.

The tool that will be used to assess the impact of Augmented/Virtual Reality (AR/VR) will be Oculus Medium because it is easier to apply in the study.

## Timeline of the Study:



## Limitations and Future Research

One of the study's limitations is the time constraints because it will take several days to collect the data from the participants. The other limitation is that some participants are

unfamiliar with Augmented/Virtual Reality (AR/VR). This can contribute to biases during data collection (Tam et al., 2019). The other limitation is that the method used in the study can contribute to the invalidity of the data because the participants will consist of closed survey questions. Further research should be done to identify ways Augmented/Virtual Reality (AR/VR) can be applied to improve healthcare services (Pillai, & Mathew, 2019). The study will lead to more research since it will provide societal information as well as enhance research in the field of AR and VR, which will be used to teach medical students and provide pain-free experiences to patients.

It will make the researchers interested in furthering research on how Augmented/Virtual Reality (AR/VR) can improve healthcare operations (Lakhani et al., 2020). The research will be significant to apply in healthcare because it will facilitate study on treating complex diseases that affect human beings (Matamala-Gomez et al., 2019). Augmented/Virtual Reality (AR/VR) can enhance the identification of some of the factors that can cause health issues that cannot be seen in real life.

### **Implications of the study**

Augmented/Virtual Reality (AR/VR) will reduce errors in treatment in healthcare because it contributes to an accurate assessment of healthcare conditions (Rosellini, & Brown, T. A. 2021). Also Augmented/Virtual Reality (AR/VR) will reduce the rate of infection of chronic diseases because it will enable earlier mitigation measures.

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