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IS390 – IS Reading and Research

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**Introduction**

The developing and expanding technology of Augmented Reality (AR) is primarily known for its ability to superimpose digital objects or data on to the physical world, enabling the interaction between the end-user and the parallel existing digital objects and the tangible physical world. Augmented Reality has attracted a lot of attention in recent times due to the vast potential of this technology to enhance different sectors, including career and trade-related instruction along with primary and secondary education. Augmented Reality technology presents an extraordinary way of attaining knowledge by giving the user a deeply interactive and immersive learning experience. This immersive learning environment using AR technology can greatly enhance the user’s comprehension of the presented information along with augmenting the user’s potential to retain that information for future use.

This study will strive to investigate the utilization of Augmented Reality as an instructional tool for job training and formal education. The primary emphasis of this study will be placed on the potential advantages and disadvantages of the implementation of this technology. Additionally, the secondary purpose of this study is to highlight some of the current uses of this technology and present through overview of Augmented Reality technology and its potential to transform the realms of education and training.

**What is Augmented Reality (AR)? How does it differ from Virtual Reality (VR)**

One of the seemingly most common things to happen in the English language is to take two things whose function is very similar but distinctly not the same and use the terms interchangeably and this has happened to a very large extent with AR and VR. In some cases, this is due to a lack of in-depth knowledge of the two items and to that end this section is going to try to explain the difference between Augmented Reality and Virtual Reality.

The dictionary at merriam-webster.com defines augmented reality as “an enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device” [INLINE CITATION WEBSTERS DICTIONARY] and to augment that a report created by the Naval Research Laboratory in Washington DC defined augmented reality as “an AR system supplements the real world with virtual (computer-generated) objects that appear to coexist in the same space as the real world” [INLINE CITATION RECENT ADVANCES IN AR] and goes on to say that an augmented reality system needs to combine real and virtual objects in the real world, runs interactively in real time, and aligns real and virtual objects with each other in order to be considered a true AR system.

One of the key takeaways from these pieces of information is that AR needs to interact with the real world which as we will soon see is something that is not needed with virtual reality systems.

Like with augmented reality let us start with the dictionary definition of the term. According to the dictionary at merriam-webster.com the definition of virtual reality is “an artificial environment which is experienced through sensory stimuli (such as sights and sounds) provided by a computer and in which one’s actions partially determine what happens in the environment.” [INLINE CITATION WEBSTERS DICTIONARY]. This definition backs up the majority of the definitions found in the article What is Virtual Reality? A healthcare-focused systematic review of definitions. This article published in March of 2023 goes into an in-dept comparison of the terms surrounding virtual reality in the medical field. One such definition was quoted as “Virtual reality (VR) can be defined as an approach to user-computer interface that involves real-time simulation of an environment, scenario or activity that allows for user interaction via multiple sensory channels.” (Adamovich SV, 2009) [INLINE CITATION WHAT IS VR? A HEALTHCARE-FOCUSED …]. As you can see in both of these definitions the key feature of virtual reality is that it is just that virtual, or a simulation.

There are many other differences between virtual reality and augmented reality but the primary one that users need to be aware of is.

* Virtual reality isolates the user from their physical environment while augmented reality tries to maintain the user’s connection to the real world.

Especially if you are selecting between an augmented or virtual reality training or education program, it might be vital to your selection.

**How does AR work?**

At this point it is well established that augmented reality over lays digital information on top of the physical environment that is around the user. How this works is very technical, and an in-depth understanding is not really necessary for the over all understanding of this papers topic but for completion’s sake we will include a shortened explanation of how augmented reality devices work.

Let us divide this explanation into three parts Sensing the real world, overlaying virtual content, and interaction and display. In order for an augmented reality device to sense the world around it relies on many different sensors to get an understanding of the world. Some of these sensors can include cameras, GPS, depth sensors, and gyroscopes

**Brief history of AR**

**Uses of AR in professional training**

Augmented Reality technology demonstrates various applications in job training. These can encompass the augmenting of tried-and-true conventional methods and more innovative and modern techniques. The use of Augmented Reality allows trainees to engage in realistic simulations manipulating virtual objects from within an environment that is both secure and monitored in order to maximize the trainees learning experience and ensure that the trainees training environment is safe ENTER MEDICAL USES LIKE SURGERY AND THE LIKE, HAZARDOUS DUTY TRAINING.

Augmented Reality has a proven track record of lowering costs ENTER TECHNICAL AND ENGINEERING INFORMATION HERE … POSSIBLE CHART OR GRAPH TO SHOW THE DROP IN COST FOR TRAINING. Augmented Reality does this by offering tailored training scenarios that are tailored specifically to work environment that the trainee is going to be involved in. AGAIN REFERENCE MEDICAL USES LIKE SURGERY AND

**Uses of AR in an educational setting**

Augmented Reality’s role in formal education got off to a semi rocky start, due primarily to the initial cost of procurement of the equipment on limited budgets FIND SOURCES ON THE PRICES FOR A CLASSROOM. The institutions that have the ability and means to acquire access to Augmented Reality equipment have steadily applied the technology with the goal of providing their students with fascinating and interactive learning environments. FIND DATA ON WAYS HUMANS LEARN – LOOK AT NEW URLs IN CLASS NOTES. Augmented Reality technology offers educators a new tool to use to convey complicated and detailed information through an instinctive and hands on approach. LEARNING PROGRAMS AND WEBSITES FOR VR AND AR. This instructional technique can be instrumental in assisting with the students comprehension and grasping of the before mentioned complex and detailed concepts, by providing a safe, highly immersive, and interesting learning environment where the student can interact with subject related virtual objects in ways that were not available to educators in previous generations.

**Conclusion and recommendations**