Role of virtual reality in education

Science, Computer Science

The use of virtual reality technology in the field of education is something that is gaining popularity. In the early years of computer technology, there were many limitations on the ways in which digital technology could be used in the classroom. The physical size of computers, in addition to their high costs, made them an unpractical option for educators. They were also limited in the tasks they could perform, so they did not provide educators with many tools. The modern world of computing is much different. Virtual reality programs can mirror real-world environments and interactions. The question of this research is whether or not it would be possible (and practical) for virtual reality technology to be implemented at public schools in the United States.

Background

In the early days of education in the United States, students were restricted to things like books and lectures in order to learn. The modern educational environment is different. Students in modern times have access to things like online videos, podcasts, and even game simulations that are based on lessons they are covering in class (Khan, 2016). On the downside, the presence of digital technology can also sometimes be a distraction for students. One student could use the website Youtube in order to do research on a class topic. However, a different student could visit the same website in order to view content that is entirely unrelated to the topics they are covering in class. Digital technology tools provide many opportunities for students to take control of their own learning experience. They also provide tools for students with attention problems to become even more distracted

when they are trying to learn new concepts. It is the task of educators to ensure that the tools are being used in an appropriate way.

While digital technology has been around for a while, virtual reality is something that is relatively new. In recent years, companies have created VR devices that allow a person to feel immersed in a digital environment. The most popular use of such technology is for gaming. People put on a headset and then walk around in a virtual environment. As they turn their head to look different directions, their in-game character also looks in those directions, which gives the game a much more realistic feel. Virtual reality programs could also be used for learning. For example, students in a biology class could use a VR program to dissect an animal. This would accomplish several things. For one, it would save the school the time and money of having to get the materials that would otherwise have been needed for a traditional dissection. In addition, it would also allow students to have an in-depth way of exploring the dissection and learning new things about the animal they are observing. If the VR program had things like quizzes and feedback, then it would also serve as a way of an instructor measuring the progress and retention of students.

Cost

Before discussing the concept of implementing virtual reality programs across the United States, it is first necessary to examine what the cost would be for such an implementation. School funding is lower in some areas than in others (Leachman et al., 2016). Some parts of the United States have been making annual cuts to education budgets (Leachman et al., 2016). The result is that some schools can barely provide the minimum requirements for their

students. A virtual reality program would not be considered a necessity, and would likely not be offered in school districts that are operating on a limited budget.

For virtual reality programs to work, a user must put on a headset. VR headset technology is still new, and the cost of one headset is typically in the range of $400 to $800. Although schools would not necessarily need to have a headset for each student, they would still need to have a reasonable number of headsets available for the students to take turns using. For example, a school may choose to purchase 20 headsets, and then give students different times that they are allowed to use the headsets. Simply purchasing the headsets alone would likely set a school back about $8k. However, the headsets are not the only cost related to virtual reality implementation. The software is what can get really expensive. Schools would need a company or individual to create educational content for the VR headsets. The process of designing software could be costly and time-consuming. Depending on the complexity of the software, it could potentially take months before it is ready to be used. A software team could charge anywhere in the range of $20k to $50k for the project. On the bright side, schools from across the United States could opt to use or purchase the same piece of software, which would save the time and money of having to create new educational software for each school in the United States. Using the same program would also act as a way of standardizing education in the United States.

The main benefit of a program that improves public education is that it can be used for fundraisers and grants. People are more likely to donate money to a program that is designed to improve education in America. If the program was instead designed for private profits, then it would be much more challenging to get funding for it. Since the program is designed to improve education throughout the United States, the costs of implementation and design could be split up and funded by multiple different sources.

Potential Problems

Whenever any novel technology or project is being created, there is always a possibility that things will go wrong. This is particularly true when the project involves digital technology. Things like software bugs and other glitches can cause problems for a team of people (Fitzgerald et al., 2014). In addition, there are also compatibility issues whenever a project is based on digital technology. For example, a team could code a VR program that is not compatible with older virtual reality headsets, and thus the project would have to be started over from scratch. Whenever school administrators are finding a team or organization to write the code for the project, they would also have to ensure that the team is familiar with what they want in the application, and that the coders have enough knowledge or experience in order to correctly complete the project. Finding the right team and management to start and complete the VR project could potentially pose many different problems. However, if appropriate time and care is taken, then those problems could potentially be avoided or mitigated.

Another potential problem for the project is in gaining support for it. Whenever projects involve new elements that have not been tested in the past, then administrators have less information to go on. They may view such projects as being much more risky than other projects that have similar versions done in the past. For something innovative like virtual reality, people at schools may view embarking on the project as being a major risk, and they may opt for improving education in other areas in which there are fewer risks and are past examples of other individuals or organizations that were successful. Gaining support from board members, politicians, and the general public may be challenging as a result of the fact that virtual reality is a new technology.

Parents may have a negative view towards virtual reality. Some parents see their young people using digital technology to get distracted from their homework. Those same parents may have a negative view about their children using even more digital technology at school. The opinions of parents are important, because parents make the decisions on where they want their children to attend school. If enough parents go against a proposed VR project at a school, then that school may lose funding as a result of the parents choosing to enroll their children in other schools that do not make use of VR technology. School districts would have the task of educating parents about the project and everything that was planned.

Other Schools

In modern times, VR devices are being used in some classrooms. VR technology is not in widespread use in the educational system of the United States. However, some universities have implemented elements of a virtual

reality system. One example is University of Phoenix. The online university allows students from remote places to take their coursework online. The university does not currently use virtual reality headsets, but they do use a more limited VR machine. Their website has a section where people enrolled in certain classes can login online and take part in a learning simulation. The simulation is an animated virtual environment. Students walk around and interact with different people and objects in the environment in order to enhance their learning experience. There are several quizzes and tests at different stages of the simulation, and they are designed to give the student and the instructor an idea of how much information the student retained when going through the simulation. Digital simulations present many opportunities for future learning.

Conclusion

Virtual reality technology is still in its early years. The headsets are expensive, and only limited programs are currently available to run on them. However, it is likely that the field of VR will rapidly advance in the future. The capabilities of VR technology make it an appropriate choice for educators. The current costs of implementing VR across classrooms is too high, but it is possible that in the future, it will be a good option for schools in the United States.