VIRTUAL REALITY IN EDUCATION

By, Mr. Dinesh A. Madhav, CSE(DS)

The virtual reality is being more and more used in the education, enabling the student to find out, to explore and to build his own knowledge. This paper presents an Educational Software for presence or distance education, for subjects of Formal Language, where the student can manipulate virtually the target that must be explored, analyzed and studied. With a simple interface, with easy comprehension and using, this paper presents an educational software where the student manipulates the objects that will be studied in 3D, getting easier the study of concepts and theories about Automatons, Regular Expressions and Minimization of Automatons interacting directly with the object in 3D. To the design of the automatons, the software uses tools in 3D, such as the Blender and the VRML (Virtual Reality Modeling Language) and to the publishing of a page on the internet it is integrated with the Program Language PHP (Hypertext PreProcessor). The results reached with the use of the developed software show the attributes that make the ideal Virtual Reality for situations of research and learning taking the discipline as a reference of the classroom to the computer labs and making it more interesting to the student, making the learning easy.

WHAT IS VR?

In a VR simulation a computer simulates and displays an environment through which we can walk and interact with objects and simulated people (commonly referred to as ‘agents’ or avatars). A virtual environment is depicted usually as a three-dimensional world and often virtual worlds try to replicate the real world both in appearance and in the way that objects behave (e.g. the simulation of gravity). It should be noted however, that there is no necessity that this virtual space be similar to the real world. Indeed, one of the virtues of virtual environments is that they can be used to depict entirely unrealistic scenarios. However, for training purposes virtual environments simulate the environment in which the student will eventually operate and provide

a safe environment in which to test scenarios that would be either too difficult or dangerous to perform in real life. There are many types of VR implementations and below we have listed 4 common setups: 1. Desktop VR (Monoscopic or Stereoscopic) 2. Immersive VR (HMD, CAVE, wide screen) 3. Collaborative Systems 4. Mixed or Augmented Reality Desktop VR, as its name suggests, has the user seated in front of a desktop computer monitor with interaction provided by a controlling device such as a computer mouse. In immersive systems the users' field of view is completely obstructed by the visualization display in the form of a helmet worn on the head. Collaborative systems may be either desktop based or immersive and involve the interaction between two or more avatars controlled by humans. A recent, and most successful implementation of a collaborative system is Second Life (www.secondlife.com). Attempts are also being made to harness the power of collaborative systems for research purposes (e.g. The Presence Project, www.presenccia.org). Mixed reality systems employ a combination of the real world viewed either directly or through a camera with overlaid computer generated content. Although relatively new, these systems have potential for training students in engineering and medicine.

HOW CAN VIRTUAL REALITY IMPROVE EDUCATION ?

Virtual reality can improve education by providing students with memorable and immersive experiences that would otherwise not be possible. What's more, it can all take place within the classroom.

VR is accessible to every student and can be easily monitored by teachers. Virtual experiences have the power to engage and inspire students in a unique and powerful way.

Given the growth of VR within education, and the positive response from schools, we wouldn't be surprised if VR made it onto the curriculum at some point in the future. Curriculum aligned content and structured VR lesson plans have already been developed and are available in the UK.

How can virtual reality help students?

There are so many ways in which virtual reality can help students but the main points are below:

1. Students learn better through experience
VR provides students an opportunity to learn through experience, in contrast to the traditional methods of reading and writing.

2. VR has the ability to inspire
Being able to see and experience extraordinary locations within the classroom is completely unique to VR and it is inspirational to students.

3. VR sparks the imagination and encourages creative thinking
The immersive experience that VR provides is unparalleled in teaching. Students are "transported" out of the classroom and their imagination is allowed to flourish.

4. VR in education promotes peer interaction
Throughout the VR experience, students are encouraged to interact with each other. Afterwards, they are eager to share their thoughts and discuss their experiences.

5. VR engages students
Many students get bored with classic teaching methods. The modern technology of VR gets students' attention like nothing else. We find that students instantly want to try out VR.

6. VR provides realistic travel experiences
Using VR, schools can provide students with travel experiences that would not be possible or practical. Schools can save time and money whilst providing students with incredible experiences.

7. VR in the classroom is inclusive
With VR, every student gets the same opportunity to enjoy the experience. Unlike traditional school trips that can be too expensive for parents or too impractical for their children, VR is for all students.

8. VR offers memorable educational experiences
Long after the VR has finished, students remember the experience and they are eager to reflect on it in future lessons.

ISSUES RELATING TO THE USE OF VR

Here we consider some of the key problems and drawbacks of using VR as an educational tool. We have identified the following three general and potentially serious drawbacks that have limited or restricted the general application of VR in education:

1. Potentially high financial costs of acquiring a system.
2. Lack of realism/fidelity/skill transfer issues.
3. Physical effects on end-users.

CONCLUSION

In conclusion, the integration of virtual reality (VR) into education and its potential benefits. It highlights how VR can enhance learning by providing immersive experiences, inspiring creativity, and promoting peer interaction. Furthermore, VR is seen as an inclusive and memorable educational tool that can engage students in a unique way.

However, the text also acknowledges some issues related to the use of VR in education, such as the potentially high financial costs, concerns about the realism and skill transfer in VR environments, and potential physical effects on users.

Overall, the adoption of VR in education offers exciting possibilities for enriching the learning experience, but it also requires careful consideration of its costs and potential limitations. The field of education may continue to explore and harness the benefits of VR while addressing these challenges to provide more accessible and effective learning opportunities.