

# VR Glasses and Leap Motion Trends in Education

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**Abstract**— In recent years, a growing number of virtual reality products have been developed. Species diversity, there are hand-held, wearable and so on, their interactive tools, application scenarios still have explored of stage continuously. Virtual reality products are widely applied to various industries, such as entertainment, health, business and education among. Currently, the real education applied to them, and universal access to education which remains to be the continuous development and exploration. This paper is trying to VR glasses and Leap Motion in conjunction with these two products, optimize the combination of these two products to play to their strengths, and applying them to educate them, to improve teaching efficiency, to enhance students' learning efficiency, so that education get optimized. The main research method used is literature study and case analysis.

**Keywords**— VR glasses; Leap Motion; education; development trend

For different devices, about the multi-touch, gesture recognition, voice control, and other interactive devices abound. These products come to get familiar with, and apply them to their respective fields. At present, among the education, the use of VR glasses to learning or teaching or small, because very few resources on education, most is now in the field of gaming and video, on these areas a lot of resources on educational resources or to research efforts, the game can use education-related content so that students with not only experience the excitement, it will therefore fall in love with this unique approach to learning, so as to equip the relevant knowledge.

## I. VR GLASSES AND LEAP MOTION RESEARCH STATUS

### A. Foreign Research Status

Abroad has been led by the sheep, at the forefront. March 9, 2016 just after the American SXSW (South by Southwest) Education Conference, Conference shown the latest technology products from around the world, is held annually in Austin, Texas, a series of films, interactive multimedia and music Festival and Congress. A very important part of this Congress is the SXSW Conference on Education (SXSWedu), brings together the most innovative education, influence of teachers, professors, administrators, businessmen and politicians, through lectures, hands-on, watch the videos, entrepreneurship contest etc, so that the participants are close

to contact with the latest educational philosophy and practice to discuss the hot topics at the forefront of education, and is slowly changing the future of education. Where someone shows "VR glasses and Leap Motion", is Linnea companies from Mexico will LeapMotion bound on Oculus, and whom designed the educational content. Their new is that, through motion capture and VR, so that users are more immersion and interactivity.



Fig.1 Leap Motion and Oculus presentation charts

They use LeapMotion gesture tracking development kit Orion, reportedly can achieve complete fingers tracing, identification point of view, there are obstacles, confusion and background lighting environment is abnormal, can still accurate gesture track. Via the included helmet Oculus LeapMotion products, users can experience through hands to rotate freely, combinations, assembling the body, or parts by hand perfect combination of fuel, Tui, etc, and to a spaceship above. The combination of the two is no longer a single feeling VR eyes to see the scene, you can not move through gestures, and interact with objects in the scene to interact with the optimal combination of both, you can experience the real visual, tactile, auditory the perfect combination, giving a sense of immersion never experienced before.

### B. Research state in China

I enter the Chinese CNKI "VR glasses and Leap Motion", the search results to 34, for the keyword input "VR and Leap Motion" search results to 322, if you enter "VR" or "interactive", search there will be thousands of results, indicating that these words are hot this year. These two devices alone do have a lot of examples, but the combination of the two is extremely rare.

Although the current situation of VR is not very optimistic, but some companies are still willing to invest VR industry, but there are some areas of education companies willing to VR technology into education, many of them New Oriental, Baidu and so these companies. Where in 2015, and New Oriental music as entered into a collaboration, they will use VR in English classroom teaching them. Baidu also plans to 2017 in some schools in poor mountainous areas build some VR classrooms, poor mountain children to bring a new experience, namely VR teaching. VR technology and Leap Motion are still in the break of the business model and product development, the company will also be other VR technologies and applications focused on the game Leap Motion and video fields, so far, the domestic rare VR device application to classroom case. In contrast, the Chinese education market is very large and highly fragmented, integration of related educational resources is necessary.

## II. THE RELEVANT OVERVIEW OF VR GLASSES AND LEAP MOTION

### A. VR glasses

VR glasses, also are known as head-mounted display, a head-mounted display (Head Mounted Display, HMD), which first appeared in the military field, real-time tactical information display, auxiliary cat prospective targets and night vision, has now widely used three-dimensional game various fields flight simulation, surgery, etc., and its basic principle is to image the tiny display through the optical system to generate a magnified virtual image.



Fig.2 .VR glasses Related Products —Oculus Rift DK2

### B. Leap Motion

Leap Motion is another new interactive devices and Kinect somatosensory after. It is used to capture hand movements, precise extent can capture all hand portion of articulation, a new generation of submillimeter manual 3D control technology. Leap Motion almost makes staff and imaging integration. By finger movements, without touching other devices to the direct control of the computer, including the computer image zoom, rotate, move, instruction, precise control, and other empty writing, sensing range of the system can be accurate to a hundredth of a millimeter<sup>[1]</sup>.



Fig .3 .Leap Motion's presentation charts

### C. VR glasses and optimal combination of Leap Motion

LeapMotion gesture tracking development kit Orion is dedicated to the preparation of VR, Orion technology will be more smooth, more sensitive to track finger movements, with the VR equipment, makes use of both more natural<sup>[3]</sup>. When people with dry immersive VR glasses virtual reality scenario, at the same time they lost contact with the real world, and this time you will need to remove VR glasses back to reality, but the emergence of Leap Motion can help you solve this issue, which is expected in the virtual reality world and the real world is established between the players of a bridge, becomes the actual situation in the world communicator, just a Leap Motion is then installed it in front of the VR glasses, infrared camera through the Leap Motion installed on and to help capture software, real world screen, allowing the player to see the Oculus Rift in the real world looks like - a bit like a virtual reality helmet to increase the augmented reality function, so do not pick frequently wearing VR glasses.



Fig .4.VR glasses and Leap Motion

Orion device directly embedded in the VR glasses, shows that we can not only wearing a VR glasses to see three-dimensional three-dimensional world, and we can control the operation of the hand scene presented objects<sup>[4]</sup>. Now we do not know visual, auditory immersion, also includes immersive tactile experience personally, think about it, if they are used for education which is how wonderful invention it!

### III. VR GLASSES AND LEAP MOTION ANALYSIS APPLICATIONS IN EDUCATION

(1) VR glasses and Leap Motion use optimization, help to improve students' interest in learning, stimulates students' motivation to learn<sup>[5]</sup>.

Immersive VR glasses, and Leap Motion manual control allow learners to experience a different learning situation, it seems really not true learning environment greatly inspired deep intrinsic motivation students who want to explore. Immersion (immersion) a good description of the people into the game of psychological processes and states. If the game can make players feel the virtual environment they experience is the real physical world, see, hear and control environment as they have learned in the real world. Interactivity is the degree of operational users within the virtual environment and natural objects to get the degree of feedback from the environment, such as the user's computer can be entered (such as gestures, language commands) to respond, or even feel the virtual objects the presence of<sup>[2]</sup>. This experience is bound to allow players to enter the game situation better, better stimulate students' intrinsic motivation psychology, you will want to play this game motivation motivation converting wants to learn, will be on student learning to play amazing effect.

(2) VR glasses and Leap Motion use optimization, more conducive to students to internalize the knowledge and experience the joy of learning<sup>[6]</sup>.

They use a combination of both, plus a wealth of teaching resources, teaching resources suitable for this general educational game software, which is an effective combination of the three will not let students feel boring, or lose interest in learning, teaching will be learned content in the way the game is rendered, and allow students to use VR glasses and Leap Motion to complete the learning task, experience the true joy of learning, so that students understand that learning is not boring, it can become very interesting and yet education significance.

(3) VR glasses and Leap Motion use optimization, more conducive to students immersed in learning situations.

By wearing VR glasses to see the learning resources designed specifically for learners of educational games, the use of VR glasses and Leap Motion is equivalent to the learner entered a post of their own learning environment, students can use gesture control, in the game participation and experience. For example, learners now go into a tropical forest is a learner shuttle in the forest which he relies on their own to find ways to escape this forest to make themselves rescued. This time the learner can learn through gestures stroke among themselves in the forest in which the orientation of the region in which to understand their forests, knows the local climate, topography, and where there is water, which direction to walk along the way will not there beast appears, and if you want to maintain physical strength, whether there can eat food, and so the forest. Through this experience I believe that some high school geography about the world's climate this piece of learning for most students is no longer a difficult task.



Fig. 5 .VR presentations equipment

This is a medical specialist in this way the human brain was observed scene, if Imagine medical students can have this experience, so for them, will certainly be more impressed, which would make their professional knowledge and skills more powerful, in order to cultivate more talents for our country.

(4)VR glasses and Leap Motion to optimize the use of more conducive to change the way students learn.

Learning through the game itself, for students is to transform a learning mode. Students nothing more than the traditional way of learning through teacher lectures, check their own learning materials, group discussion learning, etc., checks the information channel is the Internet search, go to the library, ask the teacher, and so on, there is now learning the game, change the student learning concept, students can not only learn through previous learning, you can also participate in the game by way of learning opportunities for students to learn that the addition of a choice. Appropriate teaching content manifested by the way the game, players can transform learners, digestion current knowledge learned in the game, and are happy to complete the initiative, not passive coping. At this time students will feel that learning can be done in such a relaxed atmosphere.

### IV.VR GLASSES AND LEAP MOTION IN EDUCATION APPLICATION RECOMMENDATIONS

(1) VR glasses and Leap Motion applied to some situational courses, such as history or political lesson, some important historical events, such as the prosperity of the tang dynasty its peak, can make similar resource, for students to study, students dressed VR glasses and Leap Motion, to appreciate the datang period of prosperity, students can through the bustling chang an avenue, feel the local customs.

(2) VR glasses and Leap Motion applied to some practical courses, such as chemistry and physics. Some actionable knowledge, can make the related learning resources, lets the student dressed in VR glasses and Leap Motion, waving finger also can carry out virtual operating. In chemical experiments, for example, some experiments are destructive, authenticity is not easy to operation, on the one hand, will bring great damage, on the other hand, the cost too is high, will cause the waste of resources. So, if the experiment made with VR glasses and Leap Motion to show learning resources, kill two birds with one stone, isn't it?

(3) Can also be used in the military field VR glasses and Leap Motion, such as on the cultivation of military talents can be used. Museum, large-scale exhibition hall can also be used. By making the corresponding resources, to use VR glasses and Leap Motion, achieve the result of a miracle.

## V. CONCLUSION

Technology is a driving force, in any era can push forward the continuous development of society, there is no doubt that the technology continues to update and promote the education innovation, the emergence of new technologies, the education sector will emerge adapted to hot, resulting in immeasurable impact on the current education system, teaching methods, learning methods, and so will. So, when VR glasses, appeared Leap Motion product will inevitably have a major impact in education among. They still have a good education among prospects, until the emergence of new technologies replace them. In fact, VR and Leap Motion and there are still too early for education, from the perspective of Internet technology development point of view, the emergence of any new technology, its applications are beginning start with entertainment, will be back into education art, entertainment

applications is also not universal, so education may take longer.

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