

Depth of Understanding of Virtual Reality Among Chinese Young People

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Abstract:

Background: With the rapid development in recent years, virtual reality technology has been applied in many life scenes. Young people in China have also establish a basic cognition of virtual reality through these. However, the depth of cognition still varies between different people. In order to further analyze, this article conducted relevant research. Method: Based on the survey data obtained from the 2023 “Chinese Young People’s Awareness and Acceptance of Virtual Reality Technology”, this article collected information on the application patterns of virtual reality in various fields and negative feedback from Chinese young people on virtual reality technology. The article analyzed the sources of Chinese young people’s cognition of virtual reality and the reasons for the varying levels of cognitive depth. Result: Chinese young people’s understanding of virtual reality comes from virtual reality technology applied in fields such as entertainment, home furnishings, education, and healthcare. The reasons for uneven cognitive levels can be divided into internal and external factors. Internal factors include expensive and difficult to carry VR devices, difficult to find suitable scenes, and unsatisfactory promotional effects. On the other hand, external factors include the prevalence of other equipment in the same industry, low cost-effectiveness in development, and users’ persistent doubts.

Keywords: Virtual reality; cognitive depth, data analysis.

1. Introduction

Virtual reality (In the following article, “VR” will be used as a reference), as one of the rapidly developing cutting-edge technologies in the 21st century, is penetrating every aspect of life. Nowadays, its presence can be seen in multiple fields. With the development of technology, the hardware equipment and technology of VR have also been continuously upgraded

and improved. This is also the reason why its application scenarios are no longer limited to the fantasy world, but gradually enter the public view. But even though VR has immeasurable potential, which has demonstrated its broad application prospects in many fields and helping young Chinese people establish a shallow cognition of VR. There are still significant differences in the depth of cognition among people.

“Chinese Young People’s Awareness and Acceptance of VR Technology” shows that 80% of the respondents said they had heard of virtual reality, but only 30% of these respondents had actual VR experiences. This indicates that although the concept of VR technology has left an impression in the minds of most young people in China, but its actual popularity and cognitive depth are relatively low. So what is the reason of most young people in China only stay at the level of “heard of” virtual reality? What is hindering the further promotion of VR technology among this group? Therefore, this study will start with the application of VR in different fields such as entertainment, home furnishings, education, and healthcare, and analyze how various fields can use VR to obtain novel and effective results to attract young Chinese people to learn about and establish basic cognition. Next, furthering explore why the actual experience rate of VR among young people in China is low by dividing it into internal and external factors. The final conclusion is drawn to expose the reasons behind this phenomenon. Exploring these issues is of great significance for choosing the direction of virtual reality technology’s future development.

2. Chinese Young People’s Understanding and Sources of VR

According to “Chinese Young People’s Awareness and Acceptance of Virtual Reality Technology”, more than 80% of the respondents have heard of VR technology. This result is related to the fact that VR technology has gradually integrated into people’s daily lives, bringing convenience in various fields to people [1].

2.1 VR in the Entertainment Industry

VR technology is widely used in the entertainment industry, including but not limited to games and film and television [2]. VR games stand out among numerous gaming devices for their unique immersive experience, which involves highly simulated visual, auditory, and tactile feedback, sparking players’ interest and further understanding of VR technology. The interactive operation that requires hands-on participation makes the game more challenging

and immersive, and attracts players who love challenging difficulties to try. As shown in Figure 1, the VR game “I Expect You To Die”. In this game, Players take on the role of a special agent and solve various challenges in dangerous situations. This type of game greatly tests players’ reaction ability. Compared to playing on traditional phones or computers, VR devices can bring stronger and more intuitive impact. During the play period, players’ understanding of VR continues to deepen. VR is no longer just a form of entertainment similar to other mainstream electronic products, but a new choice that can bring innovative interactive experiences. Along with the deepening of cognition, it has changed players’ traditional views on games, and games are no longer confined to two-dimensional screens.

Secondly, in terms of film and television. VR viewing is vastly different from traditional film and television. Because the audience’s identity has shifted from being a spectator to being a part of the story, their emotional experience is also more direct and intense [3]. Some viewers’ enthusiasm for this emotional impact led them to choose VR. For example, the VR panoramic interactive video shown in Figure 2 “Biolum”. From the perspective of scientific researcher Rachel, dive into the deep sea to explore the reasons for bioluminescence and explore the mysterious and terrifying unknown realm.

Finally, in terms of tourism. The popularity of VR technology in the tourism industry can be seen from the VR viewing devices installed in most scenic spots. As shown in Figure 3, the VR project “Flying Over Dunhuang” at the Mingsha Mountain Crescent Spring Scenic Area in Dunhuang provides visitors with a new and more comprehensive perspective on the beautiful scenery of Dunhuang. Whether in film and television and tourism, VR undoubtedly brings unprecedented experiences to users. Modern technology is difficult to provide people with a first person perspective on certain landscapes, so VR is used to showcase them to people. This unique responsibility has made people realize the uniqueness and importance of VR. The scenes presented by VR also leave an unforgettable impression on people, leaving the shock brought by VR technology deep in their minds.



Fig.1 screenshot of “I Expect You To Die”[4]

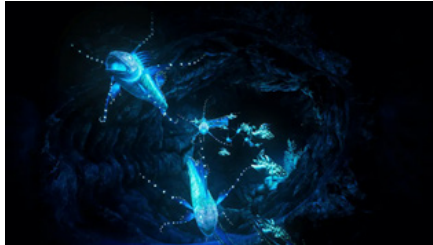


Fig.2 screenshot of “Biolum”[5]



Fig.3 Visitors to ”Flying Over Dunhuang”[6]

2.2 VR in the Entertainment Industry Home Furnishings Industry

VR technology also utilizes its features to bring convenience in the home furnishings.

A common feature is the VR viewing function shown in Figure 4, which has been implemented in most intermediary software. For example, the Chinese real estate agency software “Anjike” allows customers to view every corner of the house without leaving their homes. Not only customers can use fragmented time to check anytime and anywhere, eliminating the time and energy of going out to view houses, It also saves real estate agents the step of leading customers to view the property, leaving more time to handle other business.

In addition, virtuality means that people can use VR tech-

nology to simulate desired effects. Compared to physical simulation, this greatly reduces costs and allows for unlimited attempts and modifications [7]. Therefore, VR can also be seen in home decoration and furniture customization. As shown in Figure 5, IKEA’s VR furniture customization and decoration preview function. With the support of algorithms, customers do not need to measure the size of the room and furniture themselves, but can quickly and conveniently use VR scenes online to combine and match furniture until they achieve the desired effect. Things that can bring convenience to people are often more likable. People may not have a clear understanding of VR technology, but they have already left a good first impression of it due to these convenient functions that are closely related to life. This is beneficial for VR to be accepted by the public and increases their trust in VR technology.



Fig.4 VR online showings [8]

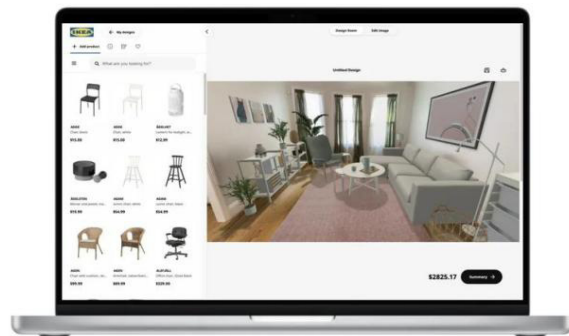


Fig.5 IKEA’s decoration preview function [9]

2.3 VR in the Education Industry

VR technology used in education is one of the earliest ways many young people in China learned about VR. VR, when used as a learning tool, has made students realize the significant help it provides. It turns what was once impossible into possible, offering students a unique way of learning [10]. It deepens their understanding of the subject matter and increases their awareness of VR technology. Whether performing dangerous experiments in a lab or

being placed in risky environments to learn from experience, VR technology can simulate scenarios that ensure the safety of both teachers and students while allowing students to learn relevant knowledge. For example, in the fire scene simulation in Figure 6, the realistic sense feedback lets students truly feel the fear and danger of a disaster. As a result, some schools in China have already set up VR training rooms (as seen in Figure 7), allowing more students to learn about VR technology.

Additionally, in VR simulated museums, visitors can closely observe precious and fragile artifacts that are hard to see in real life. They can freely interact and explore the historical meanings behind them.

At the same time, VR also plays an important role in preserving intangible cultural heritage. The combination of advanced technology with traditional culture helps continue the legacy of these traditions, bringing back cultural elements that might have been buried over time. In the research paper “The Impact of VR Technology on the

Inheritance of Tangshan Shadow Puppetry” by Jun Wang and Yanze Yang, the influence of VR on China’s intangible heritage, shadow puppetry, is explored [11]. As shown in Figure 8, the combination of the two has produced impressive results, bringing attention to both. Some young people are fascinated by VR games and are eager to experience the charm of shadow puppetry through games, while others, with a deep love for traditional shadow puppetry, are willing to try the new VR technology.



Fig.6 Fire scene simulation [12] Fig.7 VR training rooms [13] Fig.8 VR shadow play [14]

2.4 VR in the Healthcare Industry

In the medical field, VR technology is useful for both doctors and patients, tailored to their needs. However, what remains the same is that it makes things easier while reducing the burden on both doctors and patients. It demonstrates its versatility and reliability, which has helped increase VR’s acceptance in society to some extent.

For doctors, VR can simulate surgeries for practice, offering flexibility with different surgery scenarios, difficulties, and case options. Compared to real dissections or animal experiments, VR surgeries avoid the risks and mistakes that might happen during actual operations and also reduce training costs. This allows doctors to quickly gain confidence or further improve their skills. Figure 9 shows

the VR surgery training process captured during research at the University of California, Los Angeles (UCLA).

For patients, as shown in Figure 10, VR can turn repetitive rehabilitation exercises into fun, goal-oriented games, helping patients adjust their mindset and engage more actively in practice for better recovery results [15]. It can also simulate uneven roads, crowded situations, or other complex life scenarios for patients to practice, helping them better adapt to real environments while ensuring their safety. Additionally, VR rehabilitation software includes real-time feedback and evaluation features, which can record patients’ movements and reactions during training and provide useful feedback and suggestions. This helps both patients and doctors efficiently understand and plan the next steps in treatment [16].

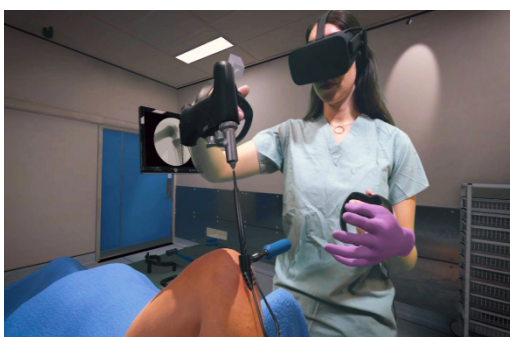


Fig.9 VR simulate surgeries[17]



Fig.10 VR rehabilitation training [18]

3. The Reason Why Most Young People in China Have only “heard of” VR

The report “Chinese Young People’s Awareness and Acceptance of Virtual Reality Technology” mentions that among the 80% of respondents who have heard of VR technology, more than 30% have actually experienced VR. This shows that VR has become quite popular among young people in China, but the depth of understanding is relatively low. The reasons for this can be explained by both internal factors of VR itself and external factors.

3.1 Internal Factors

The unique features of VR have brought it attention, but they also prevent some people from learning more about it.

First, VR devices are expensive. The price of basic VR headsets ranges from a few hundred to tens of thousands of yuan. For a complete VR setup, the price starts from thousands of yuan and can go much higher. Most VR devices are also large and oddly shaped, making them less portable than phones, laptops, or tablets. This has caused some people who are interested in buying to hesitate. Even though they may spend a lot on VR equipment, the usage and portability are lower compared to regular electronic products, making it less cost-effective.

Second, some VR applications have extra requirements. For example, VR games often need a large space to move around. However, for many young people in China, their homes are often too small for VR gaming. Even if they manage to clear some space at home or go outside to play, furniture or outdoor obstacles may pose a danger to users wearing VR headsets, who can’t see the real world. User safety is not guaranteed. Renting a special space for VR would add more cost, which is not suitable for personal users.

Lastly, VR’s unique nature means that current advertising methods cannot effectively show the real VR experience. The most striking feature of VR technology is its highly immersive experience, but using regular videos to show VR scenes doesn’t highlight this. The visuals don’t look much different from typical phone or computer games. Given the high price of VR devices, it’s not practical to let customers casually try them out like other products.

3.2 External Factors

Some external factors, which cannot be easily controlled, have also affected the spread of VR. Compared to mainstream electronic products like phones, computers, and tablets, VR has fewer resources in gaming and video content.

First, VR started later, so the amount of content in its library cannot compare to other mainstream products that have been around for much longer. Second, developing VR games requires a lot of money and advanced technology, making it hard for small and medium-sized companies to enter this field. For large companies, the high development costs of VR games, combined with low profits, make them less appealing. According to the 2019 Global Gaming Industry Report by Super Data, the total revenue of global video games in 2019 (including streaming/VR/AR) was \$120.1 billion. Of this, mobile games took \$64 billion, PC games took \$29.6 billion, and console games took \$15.4 billion. After these three categories, the remaining categories, including VR, only made \$11.1 billion. This shows that only a small number of users choose to buy VR games, and the lack of audience is hard to fix quickly.

Another concern is that some people still have doubts about VR technology. Physically, some users may suffer from 3D motion sickness. If the VR visuals are too realistic, the brain may think it’s real, but other parts of the body won’t sense any movement, causing the brain to feel confused and scared. It then triggers dizziness as a defense mechanism. The more realistic the visuals, the worse the symptoms. However, realistic visuals are one of VR’s most important features, making it difficult for people with this condition to use VR products. Psychologically, the change in identity may also affect users’ emotions. VR turns people from observers into participants, and the realistic feedback through all five senses blurs the line between virtual and real. In situations like playing shooting games, exploring horror scenes, or facing tough decisions, some users may experience strong psychological effects. Feelings of guilt, fear, and responsibility can make users uncomfortable, leading them to fear and reject VR technology.

4. Conclusion

This article discusses the application of VR technology in some areas of life, such as VR games and movies in the entertainment industry, VR online convenience functions in the home sector, and VR scenario simulations in education and medicine. It finds that the presence of VR technology in daily life has laid a foundation for the cognitive development of young people in China. The obstacles faced by VR technology in promotion stem from both internal and external factors. Internally, VR is generally perceived as expensive and difficult to carry around; besides, it has additional requirements for usage space, making it challenging to ensure user safety in unsuitable environments. The difficulty of demonstrating the actual effects

of VR technology through modern advertising methods also adds to the promotional challenges. Externally, even before VR became mainstream, popular electronic products like smartphones, computers, and tablets had already captured the attention of young people in China. Regardless of improvements and content libraries, VR struggles to compete with these mainstream electronic products that have been part of people's lives for a long time. Moreover, the high input and low return of VR technology mean that only a few companies are willing to invest significantly in its development. Negative feedback from users experiencing 3D dizziness or psychological burdens contributes to the loss of some audience for VR.

Current research overlooks the notion of "Chinese young respondents," which is too broad. While this data provides some preliminary understanding, it fails to detail important factors such as the age, profession, education level, and regional differences of respondents that may lead to varying levels of VR awareness. Future research should increase the precision of data to ensure its reliability. For this study, segmenting respondents based on backgrounds like urban or rural dwellers, workers with different income levels, and students from various academic backgrounds would be beneficial.

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