Virtual Reality in Kindergarten

Dr. AJAY KUMAR,
Department of SAINI School Management Studies,
Graphic Era Hill University, Dehradun, Uttarakhand, India 248002

Abstract

Children's emotions, dispositions, and actions are influenced by their immediate surroundings. By "physical environment," we mean the layout and design of institutional spaces like schools and lecture halls. Children learn the most during their time in a kindergarten setting, which is why the past decade has seen a number of modifications in the design of kindergartens as a result of shifts in both architecture and pedagogy. While architects produce designs in accordance with architectural theories and building standards (the "theoretical approach"), psychologists think that design should support local programme and philosophy (the "pedagogical approach"). This research will provide a novel strategy for improving kindergarten facilities, with the development of client-based design as a third strategy to integrate the first two. Therefore, kids were included in the preliminary stages of the project's design and development, representing a more advanced rung on hart's ladder. They were shown two different kindergarten designs in a virtual reality (VR) setting, namely a CAVE (Cave Automated Virtual Environment), and given the opportunity to provide feedback on the proposed layout and paint colours. The findings confirmed that CAVE is a powerful visualization tool that is well-suited to the abilities and visual perception of young learners.

KEYWORDS: Physical environment; Kindergarten; Design; Virtual reality; Children participation
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Introduction

In order to improve students' learning outcomes, informatization in preschool education entails preparing a variety of teaching aids using cutting-edge computer knowledge and technology. This, in turn, facilitates teachers' efforts to foster students' information-technology sensitivity and equips them with a full range of integration skills. Children as young as three have been using a wide variety of electronic gadgets both at home and abroad as a result of the constant development of new information technology innovations. While the vast majority of kids use electronics for things like playing games, picking up trivia and watching movies, there are a number of I.T. tools like tape recorders and computers that are out of reach for younger kids. In most domestic kindergartens, the instructor controls the computer and plays a PowerPoint presentation while explaining concepts to the children; the children are not allowed to interact with the technology. Many kindergartens in industrialised nations provide youngsters with access to sophisticated interactive tablets and other gadgets. Tablet computers are so widely used in the classroom that even kindergarten instructors in Florida are eager to give them a try as a means of imparting information to their young charges. Preschool informatization in China clearly has room for development.

Since the turn of the century, there has been remarkable progress in virtual reality and wireless communication. In addition to Bluetooth and WIFI, the newest communication technologies and protocols have been established thanks to advancements in wireless communication technology. Virtual reality hardware has evolved to support a wide variety of platforms, including smartphones, PCs, standalone units, all-in-one designs, and more. Virtual reality (VR), the proliferation of mobile devices, and the development of wireless networking are all interconnected. As products of modern technological advancement, these two tools allow kids to better understand what they're seeing on virtual reality and augmented reality devices, regardless of whether they've seen them previously or not. Virtual reality (VR) and wireless communication technology (WCT) in the classroom can open up a world of possibilities for early childhood education, allowing children to develop lifelong learning skills and positive study habits from the get-go. Long-term uses of technology like wireless communication or virtual reality need to be taught as early as possible in school. The importance of teaching young children about wireless communication and virtual reality technology cannot be overstated, and research shows that exposing kids to these technologies at a young age increases their likelihood of adopting them when they reach adulthood.

The Realms of VR

Entertainment, construction, metrology, the military, industry, medical, training, and a plethora of other disciplines have all benefited from and used virtual reality. He thinks that VR will significantly alter people's daily routines and responsibilities. Virtual reality was named by the National Academy of Engineering as one of the century's Fourteen Grand Engineering Challenges. According to Sherman and Craig's human-centered definition of virtual reality, the term refers to a medium made up of interactive computer simulations in which the user's or participant's positions as well as actions are detected in order to supplement or replace the feedback to one or more senses, resulting in the sensation of being mentally immersed in a simulation or virtual world. Virtual reality (VR) refers to computer-generated representations of dimensional objects or situations with presumably genuine, direct, or physical user interaction. This concept was established relatively recently by Dioniso et al. The initial definition, by Burdea and Coiffet, verifies the three most crucial features of VR: immersion, interaction, and imagination. Multiple input and output devices differentiate virtual reality by allowing for a two-way exchange of data between the user & the virtual environment. From a technical standpoint, we say that a virtual world is "immersive" if it allows users to see 3D models of real-world items.

In the field of architecture, VR has mostly been used to improve the sensation of "visiting" a nonexistent building. Researchers in the field of virtual reality have worked hard to make the medium a useful one for the development and investigation of new designs. The ease and low cost of evaluating the shape and design in a virtual environment as opposed to manufacturing or revising a real model have led to the widespread use of VR in the design industry in recent years. An example of a fully immersive virtual reality system is the Cave Automated Virtual Environment (CAVE), which was first demonstrated at the Annual Conference on Computer Graphics in 1992, more specifically within the Special Interest Committee on Graphics and Interaction Techniques. The CAVE has undergone slow but steady development over the past two decades. The CAVE is often a 10-foot-by-10-foot-by-10-foot space inside a larger, darker room; its cubic form is an approximation of a sphere. Rear-projection screens form the CAVE's side walls, and a down or rear-projection screen forms the floor. Scenes projected in this configuration create the participant's shadow, making for a more immersive experience; the CAVE is seeing growing usage and exploration in a wide variety

of projects and application areas. It is utilised in a wide variety of fields, including the military, education, medical, scientific visualisations, and training.

The NICE project was the first to use the CAVE as a teaching tool in a virtual reality environment; NICE is a system that uses virtual reality that employs the CAVE to give kids the chance to build and interact with their own virtual ecosystems, and then use those ecosystems as the basis for their own narratives.The second case study is an effort to use the CAVE technology for infrastructure to create a virtual reality experience that helps autistic children between the ages of nine and twelve with their social and communication skills [2]. The virtual reality project's components were developed based on preplanned situations (that were devised based on the behavioural and cognitive characteristics of autistic children). Thirdly, there is study that compares how well children and adults deal with the difficult perceptual-motor problem of bicycling across two lanes of opposed to traffic versus cycling across two lanes of one-way traffic; participants aged 12 to 14 years old rode a bicycling simulator in an immersive virtual environment; results showed that the children had lower skill levels than the adults. The study's findings have important ramifications for elucidating the connections between perception, action, and cognition, as well as for identifying the causes of car-bicycle collisions.

Problems in the Development of Preschool Education Informatization

Despite education informatization being a top priority in policy documents, just a fraction of those goals have been met. Teachers may also employ visual aids, like as movies or PowerPoint slides, to break down and analyse particularly challenging problems. Although there has been significant progress in informatizing preschool education, there are still important problems that have not been addressed.

No Customized Education for Preschool Children

The development and well-being of children's minds and bodies should be central concerns in preschool curriculum. Preschool is a time when many kids still haven't developed the best study habits. Many parents and preschools, however, favour easing restrictions on early learning so that kids may pick up more skills. As children's resistance to learning grows, they are more willing to forego sleep in favour of cramming for tests. Preschool education is provided by a wide variety of organisations. In reality, a centralised analytic platform for each student's unique educational requirements is essential in the modern preschool education carrier, whether it be a kindergarten or a home. It also requires the integration of cutting-edge technology to assess each student's individual learning requirements and tailor lessons accordingly. There shouldn't be any "I'm the smartest" contests for the blind. If this is not done, then the informationalization of preschool will not help children learn.

Preschool Education Information Resources Are Scarce

Many rural regions in China still lack access to even basic information technology, much alone information-based teaching tools like computers. Even if schools have access to computers, teachers and students will not make use of them. Even less likely is that they will be used in preschool classrooms. Institutional data analysis reveals that the examined kindergarten classrooms had adequate information technology infrastructure, with a reasonably wide variety of devices available for use in each classroom. The average ratio of devices with complementary characteristics has hit 0.6. Among these, the rate of smart board implementation in outlying preschool education settings is much lower than 0.05. All necessary supplies and tools for teaching with technology are readily accessible in the urban childcare centres. New computer equipment is needed to

address the fact that pre-school education in far-flung places still lacks informatization tools.

Lack of Practical Ability Training for Preschool Education Information

Primacy Learning Children's hands-on experiences are crucial to their early cognitive development. As it is, children may sit and listen to lessons without ever getting their hands dirty. Children's development of their practical skills may benefit from this kind of instruction. The author determined via the distribution of the questionnaire survey that nearly no youngsters in China had direct experience with the technology. Most of them are seeing first-grade instructors use the tools. Children are able to utilise technological goods independently between the ages of 0.916 and 0.068. Below you'll find a table and figure detailing the issue in question. Currently, there is a disparity between the kindergartens where various early childhood educational institutions are located in terms of the quantity and quality of instructional resources (computers, cameras), which in turn leads to a disparity between the children's engagement in preschool education and the final acceptance of the children's knowledge. The kindergarten teachers' curriculum and the tools at their disposal are directly linked to the development of the children's practical skills. The ultimate goal of kindergarten education is to improve children's practical skills via the dissemination of knowledge.

The Informatization Innovation Strategy of Preschool Education under the Background Virtual Reality Technology

The youth of today are maturing at a period of exponential development in computer science. The preschool curriculum of today must be different from that of yesteryear. The incorporation of technological advancements into early childhood education is a direction that the field of education is heading in the near future. Children's growth and development will be aided by the advent of digital technologies like information technology. The newest computer hardware in preschool education has been shown in related scientific studies to have positive effects on children's brain development and to aid in the development of children's hands-on skills, logical reasoning, and imaginative capacities. This section offers solutions to current issues in preschool education information technology and recommendations for the effective use of wireless communication and virtual reality technologies in this domain.

Build a Child Learning Analysis Platform Based on VR and Wireless Communication Technology

The inability of young children to receive individualised education can be addressed by integrating wireless communication and virtual reality (VR) technologies, with big data technology applied to telecommunications serving as a final piece of the puzzle. A data analysis platform for kids' education is built by combining data with other technologies. With the use of big data, the platform can scour the Internet for informationalized educational resources and recommend the finest of these resources to instructors so that they may enhance their own teaching skills. In addition, the platform's background data statistics provide a more nuanced picture of children's development levels across domains once they have used VR and wireless communication items. Children's data on how they learn while using VR devices may be used to identify common learning issues and guide the development of individualised solutions.

Introduce VR and Wireless Communication Equipment

Actually, a single virtual reality (VR) all-in-one device may make up for all the shortfalls caused by the lack of preschool education resources. During class, students may see a variety of high-quality, realistic images while also gaining valuable insight. You can mimic without using your eyes or any other costly tools. The issue of

scarce materials is therefore resolved. Companies like Baidu have recently released VR all-in-one machines, and their wares have already found applications in settings as diverse as VR industrial parks, instruction, party building, labs, and elementary and secondary school classrooms. These examples demonstrate how the technology has been put to use in the field of early childhood education. As an added bonus, the gadget is affordably priced enough to be used in classrooms. There is no shortage of resources that a virtual reality all-in-one system can't handle. As technology evolves, it may soon be possible to use a single device to link many virtual reality "eyes" worn on the user's heads. The issue of inadequate protection is therefore resolved.

Enhance Children's Hands-On Ability through VR Technology

Children may be motivated to gain practical skills via the use of virtual reality and wireless communication technologies. Children may participate in a variety of sports and do a wide range of hands-on procedures with the use of virtual reality's imitation of handheld displays. Preschool education curricula should use virtual reality (VR) technology so that kids may feel like they're really there and become better at using their hands.

The quicker the time it takes for kids to become proficient with technology, the better. Encourage them to do something nontechnical after they've spent some time communicating with one other via virtual reality gadgets or electronic displays. Therefore, educators must have command of the numerous tools and pedagogical approaches they use. Teachers should put restrictions on how long, what kind, and how children use technology so that students may have a healthy learning environment free of unmanageable or unfinished assignments.

Advantage

Improve Children's Comprehension Ability

According to some research, the acceptance rate of children's knowledge in preschool education can only reach 10% if just images or words of relevant courses are delivered, and it may approach 30% under the combination of video and PPT. Seventy percent of kids like it when teachers use virtual reality and wifi in the classroom, therefore it's safe to assume that the technology boosts their students' understanding.

Relieve the Confinement of Space and Time

Conventional video playback effects are not convincing enough for certain historical situations or the demonstrative teaching of extinct creatures, and the impact of children in preschool education is not profound enough. Virtual reality (VR) and wireless communication technologies may be used to not only recreate ancient species like dinosaurs, but also to locate their corpses. Bring it back to the time period. And many hazardous scenes can also be right away simulated, like deep-sea exploration, experiencing the vastness for the sea next to sharks as well as whales, to realise the restoration of actual scenes that are not feasible by conventional methods of instruction, allowing children to learn without the specific restrictions of space and time, and also allowing preschool education to be made possible. By the time they reach middle school, kids have a solid grasp on the subject matter at hand and have developed a genuine passion for it.

Reduce the Cost of Preschool Education

Virtual reality (VR) methodologies may replace conventional hands-on experimentation with actual objects in preschool classrooms by using VR and wireless connection technologies. For instance, in the real world, chemical reaction experiments frequently result in material waste once they're finished, but thanks to virtual reality and wireless communication, kids can play the same VR images over and over again to solve irreversible situations at a reduced cost.

Improve Children's Interest and Motivation

Although preschoolers' cognitive abilities, such as their reasoning and understanding, are still developing, they can learn to complete learning activities on their own and use wireless communication after being taught by an adult. Children's interest in learning may be piqued by visual and aural stimulation, and the immersive experience of VR technology can help with both.

Challenge

Technology-based learning for the youngest learners. Virtual reality (VR) and wireless communication technologies may have both positive and negative effects on children's development. The author conducted research and came up with the following potential educational difficulties for kids in a world where cellular communication and virtual reality technologies are widely used. Virtual reality (VR) and wireless communication technologies are being employed mostly in early childhood education, despite the following difficulties. To begin, virtual reality (VR) and wireless communication technologies have several potential uses. Teachers can't do their jobs well if they don't have a set of standards to follow. Second, there are certain negative outcomes that are more likely to occur in young children because of their surroundings. Young children may confuse reality with virtuality as a result of prolonged exposure to virtual reality and wireless communication technology. Again, if young children become acclimated to the immersive experience and easily accessible information given by VR and wireless communication technologies, they may stop questioning the deeper significance of what they are seeing. They may get so acclimated to dinosaurs that they no longer wonder about their origin and evolution, for instance. There's a risk that this will dampen kids' imaginative capacities and cause them to lose their ability to think creatively. Preschool education would like not to have to deal with this kind of situation.

Finally, there may be physical effects of children's exclusive use of virtual reality and wireless communication technologies. Obesity from excessive time spent sitting and playing virtual reality games may be one symptom, as may blurred vision from staring at the screen for too long.

Conclusion

Children's growth is influenced not only by their kindergarten instructors, but also by their family, peers, and self. The informatization of the early childhood education industry is essential as children increasingly engage in the use of information technology in kindergarten, and the informationization of early childhood education through the use of wireless communications and virtual reality technology will result in a radical shift in the way children are taught and eventually produce adults who are qualified morally, intellectually, and otherwise. Children's worldviews are greatly enriched by the use of wireless communication and VR technology, which also increases students' motivation to learn and their mastery of a wide range of topics. Using wireless communication and virtual reality technologies to teach informatization to youngsters may help them get a more nuanced knowledge of the world and the principles that govern its evolution. Based on conceptual definitions, the current state of preschool informatization, and an examination of the issues plaguing the field, this article explores the role that virtual reality and wireless communication technologies can play in improving the quality of in-school learning for young children.

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