IMMERSIVE TECHNOLOGY IN NEP 2020: UNLOCKING CREATIVITY AND TRANSFORMING EDUCATION TO GEN Z AND GEN ALPHA

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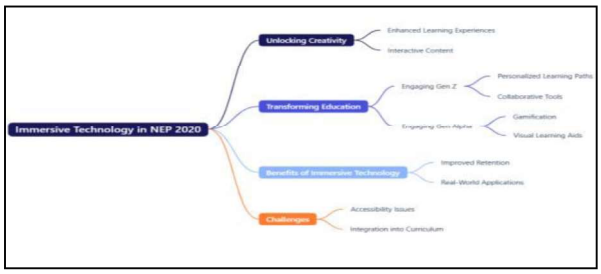
ABSTRACT

The National Education Policy (NEP) 2020 in India aims to transform the education system by integrating digital technologies like Augmented Reality (AR) and Virtual Reality (VR). AR enhances the real-world environment by overlaying digital content, while VR simulates real-life scenarios for practical learning. These technologies offer benefits like enhanced engagement, improved retention, personalized learning, and safer environments for skill development. However, challenges include high costs, limited availability, health concerns, and technical issues. To ensure equitable implementation, the government and educational institutions must focus on cost-effective solutions, digital literacy training, and infrastructure development. With proper implementation, AR & VR can revolutionize education in India, making learning more engaging, inclusive, and effective, preparing students for the 21st-century knowledge economy.

Keywords: transformative shift, virtual reality, augmented reality, national education policy, experiential

INTRODUCTION

The National Education Policy (NEP) 2020 is a transformative framework introduced by the Government of India to reshape the country's education system for the 21st century. It replaces the previous NEP 1986 and focuses on creating a holistic, flexible, and multidisciplinary learning environment. The policy aims to bridge the gap between theoretical knowledge and practical skills by integrating modern teaching methods, digital technology, and experiential learning. One of the key highlights is the shift from the traditional 10+2 system to the 5+3+3+4 structure, ensuring early childhood care, foundational knowledge, and lifelong education. With an emphasis on inclusivity, vocational training, and the use of regional languages, NEP 2020 envisions an education system that empowers students with critical thinking, creativity, and problem-solving abilities. The policy also promotes technological advancements like Artificial Intelligence (AI), Augmented Reality (AR), and Virtual Reality (VR) to make learning more interactive and engaging. By 2040, NEP aims to achieve universal access to quality education, fostering a knowledge-driven economy and positioning India as a global leader in education and innovation.



OBJECTIVES

- To analyze the impact of immersive technology on student engagement and learning outcomes.
- To evaluate the challenges and limitations of integrating AR & VR in educational settings.
- To explore potential policy frameworks for widespread adoption of immersive technology in education.
- To assess how immersive technology aligns with NEP 2020's vision for experiential learning.

SCOPE

This study focuses on how immersive technology aligns with NEP 2020 in transforming Indian education. It covers:

- The role of AR & VR in various educational fields like medicine, engineering, and humanities.
- Challenges, solutions, and recommendations for integrating immersive technology in schools and universities.
- Policy interventions and strategies for nationwide implementation of AR & VR in education.

FUTURE RESEARCH DIRECTIONS

- Development of cost-effective AR/VR solutions for economically diverse educational institutions.
- The role of AI in enhancing AR/VR-based personalized learning experiences.
- Long-term effects of immersive learning on cognitive development and student performance.
- Comparative studies between traditional and immersive learning methods in various subjects.

OPPORTUNITIES OF NEP WITH THE HELP OF IMMERSIVE TECHNOLOGY

NEP 2020, with its emphasis on digital transformation, provides multiple opportunities for leveraging immersive technologies like AR & VR:

1. **Skill Development & Vocational Training**: Virtual labs allow students to practice technical skills without physical constraints. AR-based vocational training provides hands-on experience in fields like engineering and medicine.
2. **Inclusive & Personalized Education**: Special education students benefit from AR/VR tools that cater to their unique learning needs. AI-driven VR platforms offer customized learning paths, improving student comprehension.
3. **Remote Learning & Accessibility**: VR classrooms allow students in remote areas to experience high-quality education. AR applications make complex subjects more understandable, reducing educational disparities.
4. **Enhanced Teacher Training**: VR-based teacher training modules provide real-world classroom simulations. Educators can use AR to create interactive lesson plans, improving teaching efficiency.
5. **Research & Innovation**: Universities can develop AR/VR-based research projects to push the boundaries of knowledge. NEP's focus on digital literacy fosters a tech-driven research ecosystem.

VIRTUAL REALITY

On the other hand, Virtual reality also known as VR refers to a digitally created three-dimensional environment in which all events taking place are similar to real-life instances as seen through the real senses of the user. The environment is made with the help of computer hardware and software, though users may also require the use of some devices like goggles, headsets, bodysuits, and others to interact with the environment.

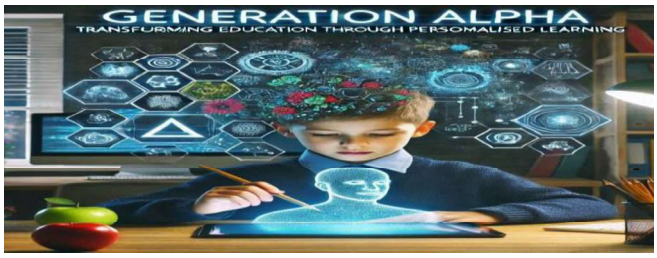


AUGMENTED REALITY

Augmented reality (AR) on the other hand is the addition of computer-generated images, videos, or sound to the existing real-world environment. AR technology places content on top of the real world and enhances the way a user sees the real world instead of replacing it.

AR devices are built with the capabilities of cameras, sensors, and displays. This can be

limited to smartphones and tablets that enable mob AR experiences or 'wearables' which may include Smart glasses and headsets. These devices record the physical environment and then incorporate the digital material (for instance, a 3D model, image, or video into the real space. AR has its uses in commerce, manufacturing, and entertainment industries they are fast becoming popular with consumers.



IMPACT OF IMMERSIVE TECHNOLOGY REGARDING GEN Z GEN ALPHA

The integration of Augmented Reality (AR) and Virtual Reality (VR) in education under the New Education Policy (NEP) 2020 brings both advantages and the Gray side from a student's perspective.

ADVANTAGES OF IMMERSIVE TECHNOLOGY IN EDUCATION

1. **ENHANCED ENGAGEMENT PLATFORM**
   - AR & VR make learning positive side
   - Concepts are visualized in 3D, making difficult subjects (e.g., science, history, and mathematics) easier to understand.
   - Example: Instead of reading about the solar system, students can experience space exploration in VR.
2. **EXPERIENTIAL LEARNING WITH IMMERSIVE MODE**
   - Students "learn by doing", which improves memory retention.
   - Example: Medical students can practice virtual surgeries before handling real-life patients.
   - Secure Learning Environments Allow students to practice skills without real-world risks.
   - Example: Engineering students can experiment with dangerous chemical reactions in a virtual lab.
3. **EASY TO ACCESS**
   - Helps students with different learning styles (visual, auditory, kinaesthetic).
   - Beneficial for students with disabilities—e.g., VR classrooms help visually impaired students "feel" environments.

- Learning can happen at one's own pace, improving self-learning skills.

4. **BRIDGING THE GAP BETWEEN THEORY & PRACTICE**
   - Theoretical knowledge is directly applied to real-world scenarios.
   - Example: Instead of reading about the Taj Mahal, students can take a virtual tour inside it.

THE GREY AREA OF AR & VR IN EDUCATION

1. **HIGH COST & LIMITED AVAILABILITY:** VR headsets and AR devices are expensive, making access limited to well-funded schools. Not all students can afford personal AR/VR equipment.
2. **HEALTH ISSUES & SIDE EFFECTS:** Prolonged VR usage can cause eye strain, headaches, nausea (VR sickness), and dizziness. AR & VR require screen time, which may increase sedentary behavior.
3. **LACK OF HUMAN INTERACTION:** Excessive dependence on AR/VR may reduce traditional classroom discussions and teacher-student interaction. Emotional and social learning may be compromised.
4. **DISTRACTION & OVERUSE:** Some students might use AR/VR for gaming rather than learning. VR environments can be over-stimulating, leading to distraction from the actual lesson.
5. **TECHNICAL ISSUES & LEARNING CURVE:** Glitches, bugs, or software crashes may interrupt learning. Not all students are **tech-savvy**, making it **harder for some to adapt** to new technology.

CONCLUSION

The National Education Policy (NEP) 2020 aims to transform India's education system by integrating immersive technologies like Augmented Reality and Virtual Reality. These technologies enhance learning experiences and provide hands-on exposure to real-world applications. However, challenges like accessibility, affordability, and digital literacy need to be addressed. Teacher training programs, infrastructure development, and localized digital content are crucial for seamless integration. Addressing these challenges will help India become a global leader in education and digital learning. "**Immersive technology is the first step in a grand adventure into the landscape of the imagination**." Based on the quotes, my title of the paper reflects Immersive technology opens the door to a world of creativity and exploration, allowing people to experience and interact with new ideas more engagingly and realistically.