International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 08 Issue: 04 | April - 2024 SJIF Rating: 8.448 ISSN: 2582-3930

Learning Reimagined: AI and Mixed RealityRevolutionize Indian Education

[1]Gyanendra Singh , [2]Mr. Sandeep Singh

Department of Computer Applications

Chandigarh School of Business, Jhanjeri, Mohali

Chandigarh Group of Colleges, Jhanjeri, Mohali

Abstract -- Artificial intelligence and mixed reality are realities now, not just ideas from science fiction films. AI analyzes data and can provide interpretation, just like the human brain. The efficiency and accuracy of this are causing the globe to adopt it presently. As opposed to mixed reality (MR), which combines the actual and virtual worlds to create new locations and scenarios, where things are both digital and tangible and interact with each other in real time. With a focus on Indian education, this paper provides a thorough overview of artificial intelligence (AI) and mixed reality technologies and their prospective educational applications.

Together, artificial intelligence (AI) and mixed reality can revolutionize education by enhancing learning outcomes and bringing fresh resources to the classroom that have the power to change traditional methods of instruction. Like any new technology, there are hazards involved in using it, though. Experts are even in danger because of its immense power, which has the potential to fundamentally alter several industries and cause a large number of job losses. which has the potential to fundamentally alter several industries and cause a large number of job losses.

Keywords -- Mixed Reality, Artificial Intelligence, Indian Education

I. INTRODUCTION

In today's fast-paced technology world, AI and MR should be the major consideration in the Indian modernized most population education. Think of yourself being in a digital environment where you can talk to an AI language model as seamlessly as any other individual, change descriptions into beautiful images, create complex 3D models that come to life and visit them through a virtual reality. This is how ChatGPT + DALL·E image creation, Alpha 3D AI & VR are combined which marks the new era of HCI (Human-Computer Interaction). This really expedited knowledge transference by means of using ChatGPT's for quick NLP based answers to some student questions transforming learning system into conversational mode. At the same time DALL-E's ability to generate images could help convey visual appeal educational materials leading to promote understanding and retention.

This has resulted from artificial intelligence (AI) and Mixed Reality (MR) leading to a new age of innovation and transformation in many fields including education also. Today, Artificial Intelligence (AI)and Mixed Reality (MR) technologies have evolved significantly with better tools and applications. These led to a new age of innovation and transformation in many fields, including education too. AI and Mixed Reality technologies now days offers new tools and applications which is better and more precise than earlier that have the potential to transform traditional teaching and learning methods in most diverse Country like India. AI has a wide variety of potential uses in education, including improving productivity of learners, learning outcomes, personalized instruction, instant feedback, and student engagement. When all these for such big and diverse population is not possible.

II. ARTIFICIAL INTELLIGENCE

The term "artificial intelligence" is used, according to Russell and Norwig, "when a machine mimics the cognitive functions that humans associate with other human minds, such as learning and problem-solving" [2]. Here we will take explanation of OpenAI whose product is ChatGPT.

A. OpenAI

"A powerful machine learning software that uses the Generative Pre-trained Transformer (GPT) algorithm to generate human-like responses to text-based inputs" this is how ChatGPT works, which was introduced by OpenAI (San Francisco, CA) in November 2022, characterizes itself. An extensive part of data, comprising written chats, books, webpages, and articles, was used to train ChatGPT. But ChatGPT can respond to suggestions in a conversational way because to a fine-tuning procedure that incorporates dialogue optimization (Health, 2023). A family of sophisticated language models called Generative Pre-trained Transformers (GPTs) uses deep learning to improve its output. Large datasets are used to train these models here are the features of the Open AI [14].

B. Models for text generation

Text generation models from OpenAI, such as GPT-4 and GPT-3.5, also known as generative pre-trained transformers, or "GPT" models for short, have been trained to comprehend both formal and natural language. Text outputs are permitted by models such as GPT-4 in response to inputs. These models also use the term "prompts" to describe their inputs. Basically, you "program" a model such as GPT-4 by designing a prompt, which usually involves instructions or some examples of how to accomplish a task successfully. A wide range of

tasks, such as discussion, summarization, creative writing, content or code production, and more, can be accomplished with models such as GPT-4. See our guides on prompt engineering and introductory text production for additional information. Assistants Assistants refer to entities, which in the case of the OpenAI API are powered by large language models like GPT-4, that are capable of performing tasks for users. These assistants operate based on the instructions embedded within the context window of the model. They also usually have access to tools which allows the assistants to perform more complex tasks like running code or retrieving information from a file. Read more about assistants in our Assistants API Overview API Overview [15].

C. Insertions

A vector representation of a piece of data (such some text) that aims to retain some of its meaning and/or substance is called an embedding. When compared to unrelated data, embeddings of similar chunks of data tend to be closer together. Text strings are the input for OpenAI's text embedding models, which output an embedding vector as the result. Search, grouping, recommendations, anomaly detection, classification, and other uses for embeddings are all beneficial. See our embeddings guide to learn more about embeddings [16].

D. Tokens

Tokens are the units of text processing used by text creation and embedding models. Tokens are character sequences that are frequently seen. For instance, a short, widely used word like "the" is represented as a single token, whereas the string "tokenization" is broken down into "token" and "ization". Keep in mind that each word's initial token in a sentence usually begins with a space character. To test particular strings and observe how they are converted into tokens, use our tokenizer tool. For English writing, one token is about equal to four characters, or 0.75 words.One restriction to bear in mind is that the total prompt and generated output for a text generation model cannot exceed the maximum context of the model [17].

III. HARNESSING AI AND MIXED REALITY FOR EDUCATION ADVANCEMENT IN INDIA

A. The merits of AI tools and Mixed Reality in education

AI is a field of study that focuses on the artificial replication of human intelligence's cognitive abilities to create software or machines capable of performing tasks typically carried out by humans [1].The outcome of this fact is far more critical than the technology that aids in its achievement [3]. Despite teachers, researchers, managers, and students all facing perennial problems, new approaches to problems faced by these three Intelligence in Education (AIEd) is an interdisciplinary approach which incorporates computer science, psychology, and education with an intent to bolster the support of AI in education [12]. AIEd tangles the applicability of various AI technologies to facilitate and to maximize the participation in teaching-learning process. Harnessing the potentialities of AIEd technologies, subject-matter, and pedagogical methods all are interlinked and must be designed in such a way where all are integrated to maximize the learning experiences [11].

B. Advantages of mixed reality in education

MR is seen as the merging of real and virtual worlds to produce new scenarios and new environments, where physical and digital objects co-exist and interact together in real time (Croatti & Ricci, 2018) [5].A pedagogical idea or method known as experiential learning places a strong emphasis on practical learning situations in order to improve comprehension and foster the development of skills [7]. The use of mixed reality in experiential learning can improve the learning process by allowing students to participate more actively and dynamically with challenging subjects [8]. The learning outcomes, motivation and performance of students in science classrooms can be significantly enhanced by using mixed reality technologies and its immersive environment [9]. Past research has consistently demonstrated that an immersive and experiential learning environment can significantly enhance comprehension and understanding of the complex of scientific concepts and ideas. Further, it has also been demonstrated in the previous research from the cognitive perspective that mixed reality can also be a potent tool that can help students in improving their understanding and recall of scientific concepts by actively involving them in hands-on experiences and simulations [10].

IV. BENEFITS OF AI TOOLS AND MIXED REALITY IN INDIAN EDUCATION

A. AI-powered personalized learning

Personalized Learning with ChatGPT is a groundbreaking educational tool that serves at the diverse learning paces, styles and languages of students in India.One of the main benefits of AI in education is its potential to personalize learning experiences for individual students.

As Kelleher and Tierney (2018) note, AI algorithms can be used to create personalized learning plans for students based on their individual needs, interests, and abilities. This can help improve learning outcomes and engagement, as students are more likely to be motivated by content tailored to their interests [8]

B. Virtual tutors and assistants

Virtual tutors and Assistant makes the game changing effect in Rural India which grapples with an enduring struggle in providing quality education to its rural and remote areas including tier-2 , tier-3 cities. Multilingual Education in a Diverse India is easily possible with these AI tools because we know India's extraordinary tapestry of languages, with hundreds spoken across its regions, necessitates a multilingual education approach. Similarly due to diversity preserving Cultural Treasures with AI is beneficial due to its cutting-edge capabilities of AI image generation present a groundbreaking opportunity to safeguard India's magnificent cultural heritage.

Potential of AI that Could Impact Indian Education System

India is now world's most populated country, for this crowd to survive and make a better place for society to live education is an important milestone. Indian education system has a lot of challenges in front of him although it is expanded at various levels with its uniqueness. Artificial intelligence sure can help to overcome some of challenges faced by our education system and can provide certain ease to the formal education system. AI can be potentially used to overcome the language barriers which are faced by our education system. AI can give

smooth functioning to the various levels of education. AI can give individual instructions to the students based upon their past academic performances, which will be of great significance because in traditional settings it was not possible for a teacher to do this. AI powered tools will enhance the management capabilities of the teachers at various levels of Indian education. AI powered tools can be used in curriculum development; research data analysis related to education, this will enhance the capabilities of teachers, educational administrator and policy makers [23].

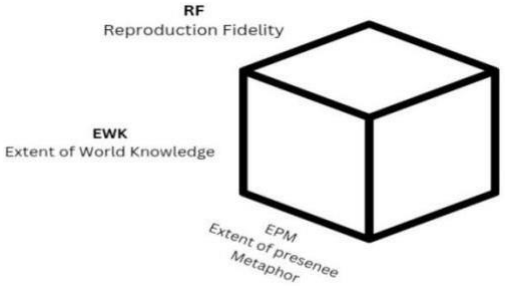
NEP 2020: Give Ground to AI To Make its Intervention - National educational policy is a document which gives the direction to the education system. Various policies in India have suggested various new recommendations depending upon the time when they created. NEP 2020 talks about various new innovations for the Indian education system Artificial Intelligence is one of them. In these various courses are suggested based upon artificial intelligence. It talks about 360-degree assessment of the students; artificial intelligence can surely be of a great advantage. NEP also emphasized the quality of education at various levels. AI supported tools can be of great importance for this.NEP 2020 emphasizes upgrading the research in the fields of AI by which we would be enabled to cater to the needs of our educational system. It recommends for the establishment of National Research Foundation (NRF) and National Education Technological Forum (NETF) to envision the unmatched potentialities of artificial intelligence and to conduct research regarding these disruptive technologies to make our students aware about the negative aspects of AI as well. NEP 2020 also suggested to develop AI based software to track the educational growth of students by the support of various data sources. These software will also helps in the career choices of students, their preferences, their strengths or weakness, interest zones etc. which could be based on the data that is received by the machine by tracking students through their learning years [18].

C. Mixed Reality in Indian Education

Monitor based (non-immersive) video displays, for example "window-on-the-world" (WoW) displays. Video displays that use immersive head-mounted displays (HMD's), rather than WoW monitors. HMDs equipped with a see-through capability, with which computer-generated graphics can be optically superimposed, using half-silvered mirrors, onto directly viewed real-world scenes. Same as the previous point, but using video, rather than optical, viewing of the "outside" world, Completely graphic display environments, either completely immersive, partially immersive or otherwise, to which video "reality" is added; and , Completely graphic but partially immersive environments (e.g. large screen displays) in which real physical objects in the user's environment play a role in the computer generated scene, such as in reaching in and "grabbing" something with one's own hand [20].

Figure.1 Reality-Virtualty Continuum (Milgram and kishino)

Figure 1 shows the reality-virtuality continuum by Milgram and Kishino (1994), where there is one part of the general area of mixed reality (van Krevelen & Poelman, 2010). In particular, they affirm that



in virtual environments, VR can replace the surrounding environment with a virtual one. Milgram et al. (1994) introduced a three-dimensional taxonomic framework for classifying MR displays, comprising: Extent of World Knowledge (EWK), Reproduction Fidelity (RF) and Ex text of Presence Metaphor (EPM) (see Figure.2)

Figure 2. Three dimensional taxonomic framework for classifying MR displays (Milgram,Takemura)

D. Virtual field trips and simulations

Immerse students in historical events: Imagine standing alongside gladiators in the Chatrapati Shivaji Maharaj period or witnessing the signing of the Declaration of Independence and any other important incident of history that we want to feel to by present there. Explore the wonders of nature: Travel the depths of the ocean, soar through the rainforest canopy, or trek across the vastness of the Rajasthan Deserts having +50 degree to Himalaya Mountain having -50 degree. Dissect complex systems: Step inside the human body and expensive or critical machines to explore the intricate network of organs or delve into the inner workings of a spacecraft respectively [21].

E. Interactive learning experiences

Mixed Reality provides Interactive learning experiences as we have a familiar window-based experience to introduce people to your content. From there, add SwiftUI scene types specific to vision OS, such as volumes and spaces. These scene types let you incorporate depth, 3D objects, and immersive experiences. Build your app's 3D content with RealityKit and Reality Composer Pro, and display it with a RealityView. In an immersive experience, use ARKit to integrate your content with the person's surroundings [19].

F. Hands-on experiments with virtual objects

It provides Hands-on experiments with virtual objects there are product of apple vision pro which provide people that feature that they

can select an element by looking at it and tapping their fingers together to do anything from that. They can also pinch, drag, zoom, and rotate objects using specific hand gestures. SwiftUI provides built-in support for these standard gestures, so rely on them for most of your app's input. When you want to go beyond the standard gestures, use ARKit to create custom gestures.

V. OVERVIEW OF VISION OS

Vision OS is the operating system that powers Apple Vision Pro. Use vision OS together with familiar tools and technologies to build immersive apps and games for spatial computing.

Developing for visionOS requires a Mac with Apple silicon. Create new apps using SwiftUI to take full advantage of the spectrum of immersion available in visionOS. If you have an existing iPad or iPhone app, add the visionOS destination to your app's target to gain access to the standard system appearance, and add platform-specific features to create a compelling experience. To provide continuous access to your content in the meantime, deliver a compatible version of your app that runs in visionOS [19].

VI. FUTURE REFLECTION ON INTEGRATION OF AI AND MIXED REALITY

Let's understand the future by understanding the future of the Vision Pro. As stated, the Vision Pro is a first-generation device running 1.x software; it has shortcomings as well as strong points, confusing choices, and functions that are absent. It's also quite wonderful. Surprisingly well, the concept is executed. And that's what makes using Vision Pro so effective: realizing that spatial computing is a practical application that isn't simply a sci-fi fantasy. The way that Vision Pro combines information and data with reality, as well as the manner that the windows and programs remain locked in, truly do represent a paradigm leap in computer usage.Not only can they zoom, drag, pinch, and rotate objects with specific hand movements, but their technology is still very new. SwiftUI by default supports these common gestures [22].

VII. CONCLUSION

This chapter presents an overview of the application MR and AI technologies in a variety of teaching and in learning environments which is existed in Indian Education. The application of these technologies in education can be seen as a set which influences, supports and improves teaching methods, strengthening the educational process and helping to develop new ways of learning. Using these technologies the students can design their virtual world learning environments [13]. which will improve their productivity in such most diversed country on the planet.

VIII. REFERENCES

1. IGI Global. What is a Higher Education Institution? Available online: https://www.igi-global.com/dictionary/higher-educationinstitution/13096 (accessed on 7 September 2021).

2. ministère de l'Éducation et de l'Enseigment Supérieur. Digital Competency Framework. Québec : Gouvernement du Québec. 2019. Available online : http://www.education.gouv.qc.ca/fileadmin/site_web/documents/ministere/Cadre-reference-competencenum-AN.pdf (accessed on 12 June 2021).

3. Russell, S.; Norvig, P. Artificial Intelligence: A Modern Approach; Pearson: London, UK, 2003.

4. Ili´c, M.; Popovi´c Ševi´c, N.; Risti´c, B. Integrating Human Resources and Customer Relationship Management for Student Satisfaction in Higher Education: Gaining a Competitive Advantage. In Proceedings of the International May Conference on Strategic Management (IMCSM), Bor, Serbia, 25–27 September 2020; pp. 501–508.

5. Croatti, A., & Ricci, A. (2018, June). A model and platform for building agent-based pervasive mixed reality systems. In International Conference on Practical Applications of Agents and Multi-Agent Systems (pp. 127-139). Springer. 10.1007/978-3-319-94580-4_10

6. Kelleher, C., & Tierney, B. (2018). Artificial intelligence in education: Applications and prospects. AI Magazine, 39(3), 45-49.

7. Maas, M.J.; Hughes, J.M. Virtual, augmented and mixed reality in K–12 education: A review of literature. *Technol. Pedagog. Educ.* **2020**, *29*, 231–249.

8. Pickering, J.D.; Panagiotis, A.; Ntakakis, G.; Athanassiou, A.; Babatsikos, E.; Bamidis, P.D. Assessing the difference in learning gain between a mixed reality application and drawing screencasts in neuroanatomy. *Anat. Sci. Educ.* **2022**, *15*, 628–635.

9. Weng, C.; Rathinasabapathi, A.; Weng, A.; Zagita, C. Mixed reality in science education as a learning support: A revitalized science book. *J. Educ. Comput. Res.* **2019**, *57*, 777–807.

10. Smith, E.; McRae, K.; Semple, G.; Welsh, H.; Evans, D.; Blackwell, P. Enhancing vocational training in the post-COVID era through mobile mixed reality. *Sustainability* **2021**, *13*, 6144.

11. Adiguzel, T., Kaya, M. H., & Cansu, F. K. (2023). Revolutionizing education with AI: Exploring the transformative potential of ChatGPT. Contemporary Educational Technology, 15(3), ep429. https://doi.org/10.30935/cedtech/13152.

12. Mishra, A., & Kumar. P. (2023). Introduction of artificial intelligence to revolutionize the Indian education system: A buzz or reality? Educational Metamorphosis 2(1), 1-6.

13. Jacka, L., & Booth, K. (2019). Students as designers of virtual world learning environments. In PreService and In-Service Teacher Education: Concepts, Methodologies, Tools, and Applications (pp. 1697-1712). IGI Global. doi:10.4018/978-1-5225-7305-0.ch079

14. KI Roumeliotis, ND Tselikas - Future Internet, 2023 - mdpi.com. Chatgpt and open-ai models: A preliminary review. mdpi.com

15. KS Kalyan - Natural Language Processing Journal, 2023 - Elsevier. A survey of GPT-3 family large language models including ChatGPT and GPT-4.sciencedirect.com

16.

17.