Metaverse in Education Sector

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Abstract:- The Internet is a global system of interconnection of a network. People can communicate easily whenever and wherever they want. Now the time has changed not only to communicate but also to live our lives in an imaginary world. Metaverse is a technology that is the advancement of AR and VR. Collaboration of Metaverse in artificial intelligence through deep learning algorithm and machine learning architecture. Due to the technology of Augmented Reality, Virtual Reality and Metaverse can make people live in their Virtual world. Metaverse plays a major role in education so students learn through a realistic view of images in 3D, virtual experience, adventure, and more. Nowadays schools are organized with interesting virtual classrooms, virtual class activities, and practical learning. In this journal, we understand how Artificial Intelligence to metaverse play a major role in the education system to learn student interestingly.

Keywords:- Augment Reality (AR), Virtual Reality (AR), Artificial Intelligent (AI).

I. INTRODUCTION

Nowadays the development of technology makes our life easy in various fields such as education, medicine, entertainment, and so on. Artificial Intelligence makes the computer think like humans through a process of trial and-error method. The influence of AI has a major impact on the metaverse. AI is developing machines as smarter as human intelligence. Metaverse allows users to feel as though they are in the center of the action. Various reality AR and VR combine with AI to perform a virtual effect. In the metaverse, powerful technologies such as blockchain, cryptocurrency, AR and VR, Artificial Intelligence, 3D Reconstruction, IoT, Edge computing, and 5G are implemented. Metaverse collaborates with AI to benefit the education system so students and teachers can utilize and learn through real experiences. In AR with devices people can view a virtual experience in our surrounding more than that VR using a headset people enter into a virtual world and feel how they land in their virtual environment. In the metaverse instead of a real person a digital avatar is created and that digital avatar acts in the position of that real person. Digital avatar plays the role of students in the education system and feels real experience while they learn science, geography, society, and much more.

II. ARTIFICIAL INTELLIGENCE

Artificial intelligence is the ability of a machine to think like a human brain. AI enables the machine to gain knowledge by giving data to the machine. So, the machine can understand and analyze the required data given to it. From unstructured and semi-structured data, it extracts fact and performs analysis, identifies patterns in the data, and learn new behaviors. AI performs human tasks using integrated human feedback in mortgage call transcripts, customer service calls, and more. UNESCO supports the definition and development of AI competencies for teachers. Learning with AI with the use of AI-driven tools in teaching and learning environments, Intelligent tutoring systems, dialogue-based tutoring, automatic writing evaluating, chatbots, and also AI tools support for disabled students.AI can help the metaverse user-friendly and easy-to-use platform.

III. METHODOLOGY

A. Augment Reality in Education

In the physical environment, digital images and information are allowed to be displayed as an illusion. For viewing the images, smartphones are needed.AR is used in education to understand children readily compared to direct classroom teaching. Teaching through detailed visualization, Object animation, macro and micro visualization, and different viewing angles. Augmented reality textbooks make students interested in learning. While learning geography and science subjects objects in 3D make students understand easily. AR experience is that it includes 25% digital reality and 75% existing reality.

B. Virtual Reality in Education

Virtual Reality is not only used for entertainment purposes but also used for education. Various VR headsets are available in the market Google Cardboard, Oculus Rift, Meta Quest 2, and much more. In Schools, students can wear headset devices and experience the realistic effect happing in the virtual world. Edtech Review [2017] states that the top 5 schools use AR and VR technology. Students and teachers experience the VR technology effect in their learning and teaching method. Student experience and get involved on a practical scale. Leading School San Francisco Unified School used Nearpod VR in their school to plan out the lesson. The school sent several virtual field trip lesson plans. Virtual 360-degree science lab, Gaming experience in VR enables learners to explore and learn while playing.

Teachers will describe, and tell a story regarding the topic while students are traveling in the virtual world. Accountancy PWC published research on the advantage of using VR for learning to find that it is 400 % faster than class-based learning. [VR advantage, PWC 2021]

C. Metaverse in Education

Metaverse needs VR/AR headsets and a wearable sensor for creating an interactive virtual world. Metaverse develops 3D software for immersive 3D space, Virtual landscapes, and simple 3D avatars. Need large storage facilities to store NFT and created objects such as avatar.AI tools Chatbots assist used in the metaverse. NLP, Speech Recognition, Computer vision, translation, and AR technologies are implemented in Metaverse to make it a user-friendly and easy-to-use platform. Metaverse making use of AI in Data learning, Digital humans, and and Language processing. Students will benefit from a more "cyber-physical learning experience and gain knowledge from virtual experience. In the metaverse, students touch and feel the object making learning fun with gamification. Flexible learning concepts with an interactive curriculum. In 3D models, students can get close to and examine abstract and complex concepts such as a human cell or an entire planet. Inspired education School launched Metaverse with a groundbreaking VR technology report by inspired Edu [2022]. The students can connect with their schools anywhere in the world. Students experience the first-hand and sheer size of an animal, pull together chemical atoms and explore the human body. In the Deep fake tech generator, Students can input the text of their speech/presentation and have a deep-fake avatar do the presentation for them.

IV. PROPOSED SYSTEM

The incorporation of classroom learning and virtual activity-based learning has an effective learning environment for students. A student's attention span in physical classroom education is about 10 to 15 minutes. Implementation of ICT tools has an interest in listening to the classroom. Physical activities with AR textbooks and VR headsets engage students actively in the classroom. Switching the environment from the real to the virtual world has to remain attentive in class. In-Class activities, as well as virtual class activities for students, have effective learning. Shorter classroom sessions and virtual activity-based learning get an easy understanding of content. Web-based AR and VR tools have to develop students' skills such as problem-solving, critical thinking and analyzing. Using the hand and body to interact with 3D objects allows students to absorb knowledge.

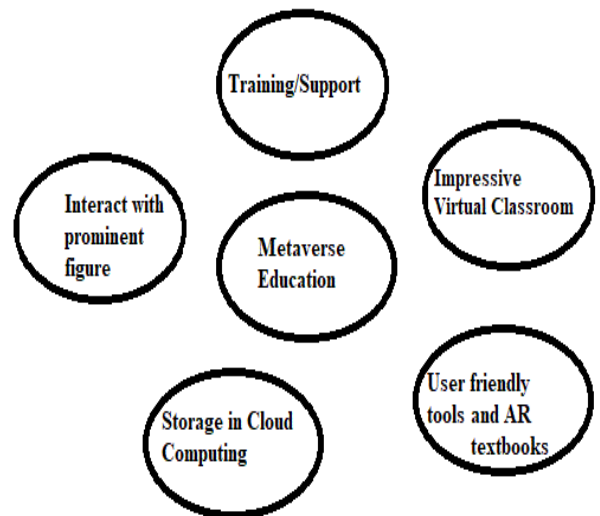## V. IMPLEMENTATION OF METAVERSE IN EDUCATION

Fig 1: Implementation of Metaverse in Education.

At the Metaverse school campus, students learn and connect in an impressive virtual classroom and do various activities in the virtual campus. Learn through AR textbooks and various user-friendly tools can improve and gain knowledge through practical learning. Students touch and feel 3D digital objects while they learn Science, Social, Mathematics, and various other subjects. In the Virtual world, students can interact with prominent figures through a digital avatar. Constantly give training to teachers and students for using technologies.

VI. GROWTH OF METAVERSE IN EDUCATION

The survey in Google trends searching regarding Metaverse in education is more when compare to Augmented and Virtual reality in education. Upgrading school with recent technology makes growth in education.
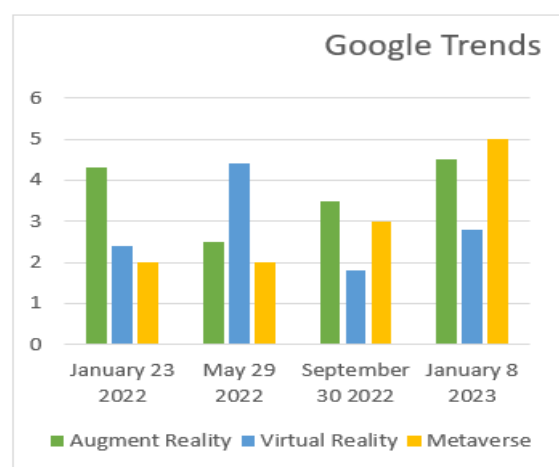

Fig:2 Comparison of Google Trends in searching keywords in Augment Reality, Virtual Reality, and Metaverse, Collected on January 8, 2023.

In searching history, there is a modulation in augmented and virtual reality topics. Metaverse topic is high when compare to augmented and Virtual reality. Therefore, it understands the topic of a metaverse in education is searching more nowadays.

VII. CHALLENGES IN THE METAVERSE

While learning through Metaverse, students get more involvement in a virtual world. Students have psychological problems when they enter to virtual world from the real world and vice versa. Digital avatars make more imagination in students' minds. AR/VR headsets affect students' eyesight. Learning in Metaverse technology is costly when compared to the normal classroom environment. Data security and privacy are less that all schools watching their speech and facial expression. Cyberattacks in the metaverse could even cause physical harm. Students have less practice in reading and writing skills. To maximize the benefit of Metaverse in education give training for teachers and students to use the technology effectively and efficiently.

VIII. CONCLUSION

In the education sector, the presence of the metaverse is a new concept compared to existing educational technologies. Due to the effect of the metaverse students learning and understanding of concepts will be more. Reinforcement for students while they learn through 3D learning methodology. As discussed above, the metaverse can provide great opportunities and innovations for education. There is no doubt that Metaverse will change the education sector in the future.

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