METAVERSE BASED CLASSROOM EDUCATION

Dr.M.Vargheese(Professor/HOD),Aashika.S.MCSE department PSNCET(Autonomous),Tirunelveli,India

ABSTRACT

Students inMetaverse can interact with teachers and communicate with classmates through their avatars. This can create great learning opportunities and increase student motivation. Using AR in the classroom can help teachers create interactive classrooms that engage students and thus enhance learning. Integrating AR products into daily operations can help businesses solve problems and increase operational efficiency. Metaverse describes a not- too distant future where people use technology to transcend their physical environment. It is a network of 3D virtual worlds where people can do business and build relationships by interacting with avatars

INTRODUCTION

The spread of the COVID19 pandemic has forced people to rethink what we teach. Metaverse, a 3D digital space that combines the real world and the virtual world, is seen as a trend with great potential in the future of education. However, according to the new project, several existing studies discuss the Metaverse from an educational perspective.In this article, we first introduce the vision of the Metaverse, including its history, definition, and common features. Then, the meaning of metaverse learning is clarified, detailed analysis of metaverse learning is proposed and its features are discussed in depth.

Also, four potential uses of Metaverse in education are explained with reasons and examples: blended learning, language learning, technical learning and inclusive learning. Also, Metaverse issues are presented for learning. Finally, a research summary of metaverse education is recommended for future research. We hope this Metaverse project involving computer science and technology education will become the Metaverse in education and lay a foundation for future research.
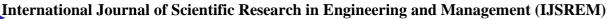
METAVERSE

Digitally enriched world is the real and business model series. In the Metaverse, people can use their avatars to perform various tasks while working or playing in a real digital environment. Metaverse is a virtual shared space concept created by fusing virtual augmented physical reality with regular physical virtual reality. Metaverse is a simulated virtual world that complements the real world, where people can interact with each other and with virtual content and environment in real time. Metaverse is a virtual environment where users can place themselvesas avatars and pretend to be in the real world.

This virtual world is one of the digital spaces that connects people and can be used for many different purposes.

Metaverse Origin:

Metaverse is a compound word composed of "meta" (beyond; beyond) and "verse" (source of "universe", cosmos; all earth), introduced a new virtual world created earlier. real world. The term "metaverse" first appeared in the 1992 cyberpunk science fiction novel "Avalanche" by American novelist Neil Stephenson (Stephenson, 1992;

Joshua, 2017). In this novel, people can interact and interact with each other through digital agents (avatars) in a 3D environment that reflects the real world. Over the next three decades, the concept of meta-universe appeared more and more in science fiction films such as Ready Player One, Lucy, and The Matrix. The virtual world seen in movies back then could not be seen in reality. In this decade, the rapid development of new technologies such as wearable devices and three-dimensional (3D) photography has helped people enter the virtual world. In March 2021, sandbox game Roblox was listed in New York as the "first stock in the Metaverse" aura; In October, Facebook announced its rebranding plan and changed its name to "Meta". Since then, countries around the worldhave been slowly making efforts to make this a reality.
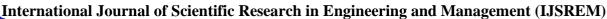
Meaning and properties of Metaverse

As a new concept, Metaverse has been much discussed by scientists. As per the records available, In 2007, the metaverse research organization Acceleration Studies Foundation took the lead in proposing a metaverse approach, suggesting that the metaverse is a combination of the physical and physical acceleration of ordered virtual space. According to two axes: "magnification and simulation" and "proximity and outside", the metaverse roadmap is divided into four scenarios: augmented reality, closed life, virtual world and glass world. This is an early concept for a finite technology metaverse. Since then, different international narratives have emerged with the development of technology. Mark Zuckerberg announced his plan to turn Facebook into a "metauniverse": an online world where people can express themselves, work, play and socialize with avatars, often with headphonesor glasses.

Tsinghua University Journalism Research Center (2021) states that the virtual world is an Internet and social application that combines the virtual world with the real world; It's like a combination of many new technologies: XR (Augmented Reality) offers a real and immersive experience. the digital twin of its environment reflects the real world and creates the blockchain lending, trading and barter process; know the relationship between the social, economic and personal in the virtual world and the real world. world and allows users to interact in the virtual world. content creation and editing. In this context, there seems to be no consensus on the meaning of Metaverse, there is no unified entity called the Metaverse; instead, some applications see Metaverses with some probability.

As per the records available, In the early 2000s, many social games such as Second Life (released in 2003) and World of Warcraft (released in 2004) began to attract millions of people. They are the leaders of what is now known as the Metaverse; however, they have received little attention since (Wiederhold, 2022).

Continuing this trend, some online or social games have regained popularity in recent years. One of the most popular games is Roblox, a sandbox game in user-generated content (UGC) format, where users can create their own virtual worlds and enjoy interacting with other players. At the same time, assets can be created by developing the game and selling it to other players. As David Baszucki (Jeon, 2021) points out, Metaverse has eight main themes: Self, Relationship, Uncertainty, Uncertainty, Diversity, Communication, Business Copy, and Success. Also, ZEPETO is the most represented social network in Korea (NAVER Z Corp, 2022) with around 200 millionusers worldwide in 2020.

In ZEPETO, anyone can customize their unique avatar by taking selfies and dressing up, and use their virtual characters to interact with others through body movements, voice calls and snapshots;   Additionally, users can also create and sell AR fashion items to generate revenue. It was announced that the virtual fan signing event of the world-famous girl group Blackpink was held at ZEPETO, the number of participants exceeded 30 million, and the number of clicks on the avatar performance exceeded 40 million. Researchers have pointed out digital games as different models (Hwang & Chien, 2022; Prieto et al., 2022). In this case, the virtual world is not traditionally known as digital games or social networks, and there are some special features to consider.

COMBINATION OF VIRTUAL AND REAL WORLD

This is the essence of the virtual world. As stated in the Metaverse Roadmap, Metaverse is a combination of virtual augmented reality and regular physical sandbox. Creations produced in virtual worlds. The narrowing or even disappearing of the difference between the virtual world and the physical world makes the user experience in the virtual world more useful, more practical and closer to reality. Fast and free access with the support of high- speed connectivity such as 5G/6G, users can instantly enter the virtual world using smart devices (such as headphones or glasses) without time and space limitations. From this point of view, it provides free and fast access to users by switching between the real world and the virtual world.

DIGITAL IDENTITIES

Instead of a static image in the virtual world, each user can change their digital identity in the form of an avatar. The structure of digital signs is more user-defined and higher than before, for example, avatars can change face content and even a hundred. It is the representative of the user in the virtual world, reflecting the identity of the user and representing his identity in the real world. In addition, users can control and manage the avatar with the help of time tracking technology. In this context, realtime 3D representation of users (i.e. digital characters) plays an important role in ownership, discussion, reflection and interaction in the virtual world.
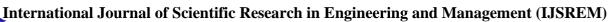
IMMERSIVE MULTI-SENSORY EXPERIENCE

In the virtual world, realistic and colorful virtual scenes modeled by technology can bring a deeper understanding to users. With the help of technologies such as sensors, VR, AR, IoT, users can interact with virtual objects or objects they want in the real world by moving and running. As Mark Zuckerberg announced the "embodied Internet," the metaverse will allow people to have a real, immersive, multimodal experience as if they were in the real world, or even the real world, as per the records available.

DECENTRALIZED AND EDITABLE CONTENT

Compared to the previous Internet model where content was restricted to certain groups such as developers, Metaverse gives all users the right to edit or create content of a virtual nature with changes in its properties, location or orientation. As seen from Roblox or Facebook (Jeon, 2021; Zuckerberg, 2021), users can create almost anything they can imagine.

Additionally, players are allowed to create or edit content that others have shared (Taylor and Soneji, 2022). More importantly, users can own and operate their own digital devices, and security technologies such as blockchain can secure and track their own devices (Vergne, 2021; Min and Cai, 2022; Vidal-Tomás, 2022).

Given the above discussion of the virtual world, we can think of the virtual world as a 3D digital space that combines the real and virtual worlds, without the constraints of the physical world (eg, time, place). It allows users to participate in various activities (such as work, education, training, social, work) through avatars and interact with other players and virtual equipment, giving users the opportunity to edit content. Users can also enjoy a richer, more convenient and unique experience than ever before. They're used for : Recreation, Travel and Tourism, Education and Training, Social Work, Real Estate, Health, Finance and Accounting andAdvertising and Entertainment.

Few examples :

1. **Easy Transfer:**

Cryptocurrencies and Small . Today's digital world requires digital currency, and digital wallets and cryptocurrencies facilitate digital currency. Users do not need to connect the bank in Metaverse and cancomplete the payment with a few taps.
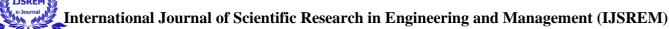
2. **Virtual Event Opportunity:**

Your favorite player in the series will not be as good on screen as in the Metaverse environment. By organizing virtual events for your customers, you can help them better understand their needs. Museums and galleries can also switch to the Metaverse radar to get the popular demand they deserveAt a recent event, an exhibition of NFT avatars was held and 300 unique avatars were sold in one day.

METAVERSE SCHOOL:

The world we live in is constantly changing with new ideas. Only a few years ago, few of us could have predicted how social media will change the world. Blockchain opens up new avenues for innovation in many different fields. Imagine talking to brands and avatars and being able to buy and sell any product anytime, anywhere. As per the records, the global market is estimated to be worth $100 billion in 2022 and will grow to $1.52 trillion by 2029 with a compound annual growth rate (CAGR) of 48%.

The future of the Metaverse depends on meeting two basic needs of all humans: connecting with others and creating something. It is always evolving and in the future Metaverse will expand into e-commerce, sales and marketing, finance, crypto business, etc. People can buy, sell and make their own goods in this 3D world. This type of e-commerce makes more sense than anything else on the internet. Immersive virtual reality technology is at the peak of its popularity today. They were created for medical research, but gradually they became the needs of the entertainment industry. With the help of special glasses and software, anyone can quickly become an operator of the game or conquer the heights of online casinos and gain access to the best online casino games for real money. The manufacturers of these products declare that they are completely safe for children and adults. But doctors who acknowledge the dangers of virtual reality glasses say otherwise. We recommend that you study thistopic in more detail.

Learning with Virtual Reality

These glasses are used for educational purposes in many countries. For example, it is recommended to use a special task before allowing a novice to drive.

VR Technology Therapy

Military personnel with post-traumatic stress disorder (PTSD) often use virtual reality glasses to overcome this condition. VR helps eliminate phobias and can speed up the healing process. Patients practice movement and other behaviors while immersed in virtual reality in the hospital. After that, they showed a faster positive recovery than patients who only received care.

VR Fun and Gaming

The benefits of VR headsets don't apply to the entertainment industry either. Now that there is no interaction between the player and their favorite game, the better the technology, the more realistic the virtual world will become. Major software vendors publish games and applications, and experiment with graphics and sound.

AUGMENTED REALITY (AR):

Augmented Reality (AR) is an interactive experience that combines the real world with computer-generated content. Subjects can encompass a wide variety of senses, including sight, sound, touch, somatosensory, and smell. AR can be defined as a system with three main features: integration of the real and virtual world, real-time interaction, and 3D recording of real objects. In this way, augmented reality replaces people's constant perception of the real world environment, while virtual reality replaces the user's real world environment with simulated one. Augmented reality is often synonymous with mixed reality. Augmented reality and computer-mediated reality also overlap in terminology. The main value of reality is the integration of objects of the digital world into people's perception of the real world, incorporating the senses perceived as parts of the environment, not just information. The first functional AR systems to provide mixed reality to users were developed in the early 1990s, starting with the Virtual Fixtures system developed in the United States.

Then the augmented reality application expands sectors such as education, communication, health, entertainment. In education, content can be accessed by scanning or viewing images or using icons with a mobile phone that does not have AR technology. Augmented reality is used to improve the environment or situation and provide a better experience. With AR technology such as adding computer vision, incorporating AR cameras into smartphone apps, and object recognition, information about the real world around the person was interactive and digitized. Information about the environment and its products is superimposed on the real world. This information may be virtual. Augmented reality is technical knowledge that adds to existing reality or reality, eg. Seeing other real data or measurements, such as electromagnetic radiation, does not correspond to their actual location in space. Augmented reality also has great potential for collecting and sharing soft information. The augmentation is usually done in real time with the surrounding context in the semantic context. Random data is sometimes combined with additional data, such as scores from video games. This includes the benefits of augmented reality technology and overhead display technology (HUB).

Augmented Reality Benefits in Education:

AR is increasingly used in educational settings, especially to help students learn difficult topics. For example, students struggling with geometry can use AR to view and manipulate geometric shapes in 3D. Another application of augmented reality in education is to teach worldview through virtual tours and enable students to

interact with other cultures. While similar technologies like AR and VR are gaining traction in education, lessthan 10 percent of schools currently use augmented reality in their classrooms as Project Tomorrow.AR creates opportunities for teachers to help students master abstract concepts. Using the interactions and exper iments provided by AR technology, teachers can improve the classroom experience, teach new skills, encourag students to think, and get students excited to explore new learning.
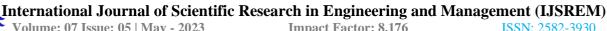
Virtual Reality:

Virtual Reality (VR) is a simulated experience that uses exposure tracking and 3D near-eye guidance to bring users into a virtual world as if they were there. Virtual reality applications include entertainment (especially video games), education (such as medical or military training), and business (such as virtual social networks). Currently, virtual reality systems use virtual headsets or multiple projection environments to create some real images, sounds and other sensations to simulate the user's physical environment. The user of a virtual device can look around, move around, and interact with virtual features or objects in the artificial world. This effect is usually created with a VR headset with a head-mounted screen and a small screen in front of you, but it can also be created with a specially designed room with several large screens. As per the records, Virtual reality often includes auditory andvisual feedback, but may allow other types of auditory and forced feedback through haptic technology.

BENEFITS OF VIRTUAL REALITY EDUCATION:

• Extends knowledge

• Increases knowledge, not just prior knowledge

• Helps understand complex concepts, concepts or ideas

• Learning without intervention

• Enhances students' creativity

• Makes students more effective 44 at increasing knowledge 44 Bad Topics like science

• Improve students' skills understand level

• Improve teachers' teaching skills using VR by providing in-depth information.

• Improve memory by connecting emotions to learning.

• It takes some time to understand complex concepts.

• Learning is based on the textbook and its link to content and practice.

• Entertainment, virtual tours and educational games are already available.

  • Develop children's thinking.(As per the collected data)

Mixed Reality:

Mixed Reality (MR) is a term used to describe the combination of real world and computer-generated systems. Physical and virtual objects can be combined and interacted in real time in a mixed reality environment. Mixed reality with haptics is sometimes referred to as visual haptic mixed reality. In the context of physics, the term "interactive reality system" refers to the link between a virtual reality system and its real counterpart. A 2007 article described a reality with a real pendulum and a pendulum that only exists in reality. The system has two states of steady motion: the 'dual reality' state, where the motions of the two pendulums do not coincide, and the

'combination' state, where the pendulum is associated with the steady phase. The use of the terms "mixed reality" and "interactive reality" is well defined in the context of physics and may be slightly different in other fields, but is often seen to be said to "connect the physical and virtual world".

BENEFITS OF MIXED REALITY IN THE CLASSROOM:

Direct knowledge creation can be a good way to interact with struggling students or provide another opportunity for them to learn. Increase attendance during school hours.When deciding where to go, student safety often influences choices, as well as the school's budget. Thanks to MR, this lesson is no longer limited.

EXTENDED REALITY:

Extended Reality refers to the collective term for Augmented Reality (AR) and Virtual Reality (VR). Sometimes the abbreviation "XR" is used to refer to both. The device is used to combine or mirror the physical world into a "digital twin" that can interact with each other.

The virtual reality and augmented reality space is growing rapidly and is widely used in entertainment, business, housing, education and remote work. Augmented reality is a term used to refer to well-known technologies such as virtual reality (VR), augmented reality (AR), mixed reality (MR), and other immersive technologies that will emerge in the future. All immersive technologies combine the physical elements and the virtual world to "expand"or create a full sense of the reality we have.

Advantages of Supplemental Capability:

• Provides a unique experience. Actually get in the loop and companies may offer users to visit attractions or trydoing it without leaving their home.

• Good information absorption. XR gives users a real-time view of the subject, enabling them to train moreeffectively.

• Safety training. People who have to perform high-risk occupations, such as soldiers or doctors, may do well intraditional classrooms.

• Uninterrupted data access.

XR breaks the distance barrier, so people can easily access information remotely.

WEB XR

TheWebXR Device API provides access to input and output functions commonly associated with virtual reality (VR) and augmented reality (AR) devices. It allows you to create and host VR and AR experiences on the web.

WEB XR purpose:

Enable XR apps on the web by allowing the page :

• Check if XR functionality is available.

• Ask for XR tool capabilities.

• Gather XR tools and associated input devices.

• Send pictures of XR equipment to the appropriate post.

Not the purpose of WEB XR:

• Describe how a virtual reality or augmented reality browser works.

• Stream any VR/AR gear.

• "Metaverse.

METAVERSE EDUCATION:

as per the data collected, Tutorial focuses on integrating Metaverse into the curriculum, where students can engage in fun games to make learning more fun. The world has many benefits in education.

Below are some advantages of Metaverse Education.

1. Immersive Learning Experiences:

Schools can provide interactive learning experiences integrated with the Metaverse experience. The practice of learning in the virtual world helps students to imagine the 3D environment. It allows students to see and interact with their peers and 3D objects in their environment, just as they would in a physical classroom.
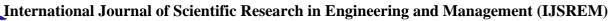
Metaverse education can enable students to experience many activities that cannot be done in traditional education, such as visiting the historical period, watching a rocket, walking behind the movement of satellites in space, and more. Eliminate the need for imagination.

2. GAMING:

Metaverse provides students with hands-on practice through games. Gamification is one of the main benefits of Metaverse Education, the process of combining something with the content of games to encourage user engagement.

Playing in the virtual world is combined with learning and entertainment to engage and engage students, where they have to complete interesting tasks. This encourages students to study and complete assignments on time. Learning becomes more engaging when objectives are given to students. Using gamification in metaverse learning, students are encouraged to stay focused and complete all assignments on time.

3.Hands-on Practice:

Metaverse assists students in a safe environment with hands-on activities that can be dangerous or difficult in the real world. It helps them gain skills in the virtual environment without harming themselves or others. Metaverse is revolutionizing traditional education by allowing students to hone their skills and prepare them for real life. Students can perform complex surgeries or dangerous experiments in the Metaverse without risking their lives.

4. Education:

Metaverse phenomenon has the effect of communicating virtual thoughts, ideas, and topics that seem real. It also provides the benefits of creating real-time peer-to-peer interactions and experiences. Metaverse helps students and teachers easily communicate without restrictions, understand each other better, and personalize learning. Schools can take students to different real-life situations where they can participate in activities and discuss what they have learned and their findings.

5. Learning Speed:

Students who took VR lessons learned faster than students in the classroom environment. Immersive Metaverse experiences through games, interactive sessions, 3D simulations and interactive games put learners first. Students in the Metaverse feel less distracted as they can better understand the content with 3D content that enhances the student's vision and attention. The virtual environment helps students learn faster and allows them to better visualize information.

6. Realizing Educational Potential:

Metaverse helps schools and students overcome financial constraints. Learning in the virtual world can reduce the cost of maintaining physical buildings and universities. Creating and maintaining a virtual environment is less costly than a physical classroom. Bringing learning to the Metaverse helps provide valuable learning materials and supports schools in lowering the cost of establishing physical education. For example, students can study on virtual cadavers in a simulated environment; this is cost effective compared to examining real cadavers.

7. Improve student performance:

Virtual learning provides a good way to help students understand key concepts by presenting concepts through ad hoc advice. They provide a learning-by-doing approach that helps improve students' academic performance. Entering virtual reality classrooms on Metaverse increases student satisfaction, engagement, and success in learning activities compared to traditional and online models. Various technologies in Metaverse allow teachers to access and view virtual student data to provide personalized instruction and study for each student.
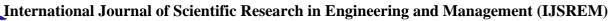
The data will also help monitor students' overall progress, identify where they are strong or lagging, and measure the effectiveness of their learning.

Also, incorporating the Metaverse into education helps gifted children learn the basics in this beautiful virtual world. These are some of the key benefits of Metaverse training.

How can virtual classrooms help rewrite the curriculum? The

Metaverse course is a rewrite of the original instruction language.

When we compare the traditional education with the education that Metaverse has, we can see the difference that Edverse wrote.

Benefits of the Virtual Classroom for Students

Let's take a simple example to understand the benefits of the virtual classroom for students. If a student from India needs to study culinary education, they will first have a hard time finding a suitable institution. The second problem one will encounter later is the distance one has to travel to the venue. As a result, not every meeting they attend grabs their attention and their retention rate is low.

Instead, Edverse's virtual classrooms give all students the opportunity to learn from experts in their fields from around the world. However, each student will have the opportunity to choose what they want to study and where they want to study. The second problem is solved by entering a metaverse class. Geo-blocks disappear as each class only clicks on one student. Finally, care and insurance enhance the expansion in e-learning.

As per the records, the results analysed of e-learning, SH!FT saw an increase in learning from 25% to 60%. Studies show that permanence in face-to-face education is between 8-10%.

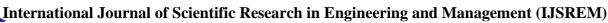## BENEFITS OF VIRTUAL CLASSROOM FOR TEACHERS

Georestrictions may affect teachers or students. As mentioned earlier, Edverse's virtual classroom handles this topic well. In addition, virtual classrooms will provide teachers with unlimited teaching opportunities. This means that the number of students they can teach will increase. In addition, 3D NFTs will be provided to teachers as a training model. These NFTs (we call them Ed-NFTs) can be used to teach students. These Ed-NFTs are an essential resource for all educators. For students to receive this information. These are just some of the limitless learning and teaching that Edverse's Metaverse courses have to offer.

VIRTUAL REALITY HEADSET

The Virtual Reality Headset (or VR Headset) is a headworn device that provides virtual reality to the user. VR headsets are widely used in VR video games, but are also used in other applications, including simulators and trainers. VR headsets often contain stereoscopic images (providing a separate view for each eye), stereo speakers, and sensors (such as accelerometers and gyroscopes) that monitor the user's head position to match virtual camera guidance with a real-world user. Some VR headsets also have eye tracking sensors and game controllers. VR glasses use a technology called head tracking that changes the image when the person turns their head. The process may not be perfect because if the head moves too fast there is a tradeoff. However, it provides an experience.

META QUEST 2

as per the available data, The Quest 2 received mostly positive reviews as an upgrade to the Quest, but came under criticism for some of its changes, including the watch strap, reduced suspension (IPD) options, and features users had to tap into on one. A Facebook account is required to use the Oculus headset and service.

Microsoft HoloLens: The Microsoft HoloLens is an augmented reality (AR)/mixed reality (MR) headset designed and manufactured by Microsoft. HoloLens runs the Windows Mixed Reality platform based on the Windows 10 operating system. Some of the tracking technology used in HoloLens goes back to Microsoft's Kinect, a device released in 2010 for Microsoft's Xbox game console. The Production Edition, a preproduction version of HoloLens, was shipped to developers in the US and Canada on March 30, 2016 for $3,000, allowing enthusiasts, experts, and companies involved in pre-production of HoloLens. Samsung and Asus have offered Microsoft to help build their own hybrid devices by working with Microsoft on the HoloLens concept and hardware. On October 12, 2016, Microsoft announced the global expansion of HoloLens and announced that HoloLens will be available for pre-order in Australia, Ireland, France, Germany, New Zealand and the United Kingdom. There is also a business suite (similar to Windows Professional) with business features such as BitLocker security. As of May 2017, the suites had sold for $5,000. Details given are as per the collected data.

SAMSUNG GEAR VR

TheSamsung Gear VR is a virtual reality headset developed by Samsung Electronics in collaboration with Oculus VR and developed by Samsung. The headset was released on November 27, 2015. When used, a Samsung Galaxy compatible device will monitor the headset's display and process, while the Gear VR unit itself acts as a controller, with views as well as an IMU for inertial measurement or rotation sent via USB-C. Micro USB connection to smartphone. The side of the Gear VR headset also has a touchpad and a back button, as well as a proximity sensor to detect when the headset is powered on.Gear VR was first released on September 3, 2014. To enable developers to create content for the Gear VR and to give VR and tech enthusiasts access to the first technology, Samsung haslaunched two new Gear VR concepts. consumer devices.

CONCLUSION

Metaverse will be a vision of many in the computer industry believe is the next iteration of the internet, that is, a single, shared, immersive, persistent, 3D virtual space where humans experience life in ways they could not in the physical world. The metaverse helps students enjoy more engaging lessons and also offers much more benefits asmentioned earlier.

References

1. *https://www.npmjs.com/package/metaversejs*
2. *https://elearningindustry.com/metaverse-the-future-of-technology/amp*
3. *https://www.diva-portal.org/smash/get/diva2:1721875/FULLTEXT02.pdf*
4. *https://github.com/M3-org/awesome-metaverse*
5. *https://learn.framevr.io/*