

# SCOPE OF METAVERSE IN EXAMINATIONS

<sup>1</sup>Yash Patil, <sup>2</sup>Mrs. Flavis Gonsalves

Mumbai Education Trust's Institute of Computer Science, Mumbai, India

---

## ABSTRACT

Over the years, technology has changed the education system in many ways, the most important exception being conducting Examinations. Traditionally exams are conducted in pen and paper mode in a classroom or an examination center. The adoption of new technologies led us to conduct examinations online using computers and the internet. Recently due to the covid19 pandemic conducting online exams became a necessity rather than a convenience. These days many universities, institutes, and competitive examination bodies are switching to online examinations. With the application of the Metaverse, we are open to whole new possibilities of conducting exams over the internet. In this paper, we will look into an elevated version of online examination with the help of metaverse and how exams can be conducted and how it can tackle the problems of the usual online exams.

---

Keywords: Metaverse, Examination, VR, Education

---

## INTRODUCTION

Exams enhance teaching by supporting teacher planning and consistent student preparation. Examinations are not limited to measure educational or societal potential of the students but incorporate in a way of coping with the educational system. Reviews often determine the level of educational objectives are achieved as well such as the extent to which educational institutions meet the needs of the community and society. Exams can affect both teaching and learning.

As of now most of the examinations are conducted in traditional ways i.e., classroom-based examination or commonly known as offline examination. The general process of this test includes two subjects, the examiner and the candidate, the person or organization who conducts and/or supervises the examination and the candidates who appear for the examination respectively. To successfully conduct such examinations other supporting entities like invigilators, question paper setters and distributors, management and helping staff etc. are equally involved. These entities are usually accommodated in a physical space like examination center which consist of all the infrastructure required for offline examination. All this infrastructure requires a lot of time and resources.

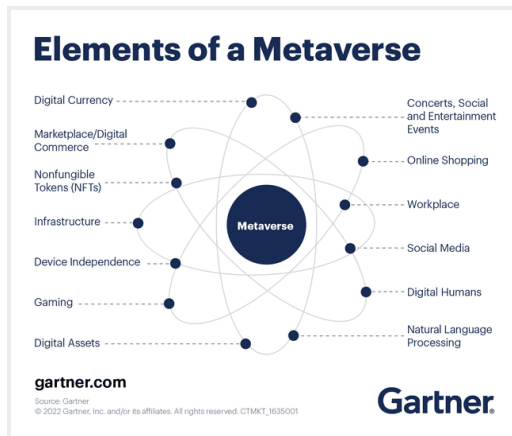
The other most common mode of examination is online examinations. Unlike offline review, this process uses less infrastructure and other costs. In this type of examination, instead of being physically present in exam centers, everyone is connected to each other via the internet. This test method requires less resources and eliminates the need for questions and answer scripts, as well as exam room scheduling, invigilator coordination, and more. Exams are taken online using web-enabled devices such as laptops and desktop PCs. Most of the questions on these assessments are multiple choice, and candidates need to choose the correct answer from a list of options. Most online examination platforms also offer auto-evaluation facilities to speed up the process of generating results.

Both types of examinations mentioned above have their own set of drawbacks, and with the help of metaverse, most, if not all, of these flaws can be overcome. A metaverse is a network of 3D virtual worlds focused on social interaction. It can be defined as a simulated digital environment that uses augmented reality (AR), virtual reality (VR), and blockchain, along with digital media concepts, to create environments for rich user interaction that simulate the real world. In Metaverse you may do almost everything you can in real life, such as observe and converse with people, interact with items in your surroundings with your hands, exchange information and

resources, and in our case, it can also be used for taking exams online and help in better assessment of candidates.

## OVERVIEW

The Metaverse is a combinatorial innovation since it operates on numerous technologies and trends. Augmented reality (AR), flexible work methods, head-mounted displays (HMDs), an AR cloud, the Internet of Things (IoT), 5G, artificial intelligence (AI), Blockchain, and spatial technologies are all contributing tech capabilities. [1] Consider a Metaverse to be the next step in the evolution of the Internet, which began as a collection of bulletin boards and websites. These locations eventually became destinations on a virtual shared area, like how the Metaverse will grow.



**Fig. 1 Different Elements of Metaverse**

### What's the hype about Metaverse?

The Metaverse is generating a lot of buzz, with several technology businesses claiming to be Metaverse companies or constructing [2]. Metaverses to enhance or augment people's digital and physical experiences. Furthermore, activities that are currently carried out in separate settings will someday be brought together in a single Metaverse, such as:

- Buying online avatars' clothing and accessories
- Purchasing virtual land and building virtual residences
- Taking part in a virtual social gathering
- Immersive commerce allows you to shop in virtual malls.
- Virtual classrooms are being implemented to provide immersive learning experiences.
- Digital art, collectibles, and assets are all available for purchase (NFTs)
- For on boarding employees, customer service, sales, and other commercial activities, communicate with digital avatars. [3]

In a technical sense, there is no one way to enter the Metaverse. The concept isn't fully developed yet since it will require a single unified universe that is interconnected in the same way that the Internet is. As a result, there is no one Metaverse program that can be launched. However, because the Metaverse is fundamentally a digital realm, parts of it can be found on a variety of platforms. These pieces take the shape of various applications and games that allow users to enter them and interact with avatars while socializing and playing.

### Examples of Metaverse

1. In gaming industry Axie Infinity:

A play-to-earn game where a player can farm in game tokens which can be then sold on the open market for real money.[4]

2. In retail industry ZARA:

A fashion brand outlet where users can try out the clothes in metaverse instead of going to the store before buying them.[5]

### Application of Metaverse in Examinations:

So, in order to experience the Metaverse, we'll need to have at least one of the applications (that implement metaverse elements) installed on our devices [6]. All we need is a very good internet connection like 5g, Internet-connected devices like smartphones, computers, and smart wearable to interact with virtual worlds.

To implement the metaverse in the field of education, or in our case, particularly for examinations, universities can contract third party service providers like Zepeto to create virtual exam centers for them where students can undergo assessment.

Exams using metaverse can be administered at an exam center or at a place that the examinee prefers. The infrastructure required is comparable to that for an online test, with the exception that numerous more technologies have been incorporated to enhance the experience. From a Virtual Reality standpoint, the user must log in using the appropriate application, strap on the VR headset, and interact with the virtual aspects of the assessment using the Controllers.



Fig. 2 Virtual Reality Glasses

## RESEARCH METHODOLOGY

### Challenges with current examination systems:

1. Arrangement of supplies take too many resources-

Each student must receive a copy of the questionnaire, along with the answer sheet and supplements, from the institution. As a result, they must arrange for the delivery of question papers and answer sheets to the testing center. Many times, question papers and answers papers get misplaced or leaked which creates an untruthful environment for the organization.



Fig. 3 Zepeto Based Metaverse Classroom

**Solution:**

Because metaverse is a cloud-based platform, question and answer papers will be sent to students in their devices which reduces the danger of physical damage at any point. Because it utilizes blockchain, any digital breaches are prevented, making it significantly more secure than traditional online assessments [7].

## 2. Grading long answer-type questions is difficult-

Even while online exams have made invigilators' jobs easier, long answer-type questions are still a concern. Subjective responses necessitate manual grading, which requires additional time from examiners. This is where the modern and old systems collide.

**Solution:**

Using a controller, it is possible to write subjective answers. The controller will act as a pen and can track the user movements which will help to interact with the aspects of virtual assessment. Thus, grading of subjective replies will become easier.



**Fig 4. Pencil Used for Virtual reality**

## 3. Vulnerable to cheating:

Cheating is one of the biggest drawbacks of an examination system. Students' computers offer a variety of ways to cheat, including attaching external drives, file sharing, and enlisting the help of others via their smartphones or smartwatches, among other things. Furthermore, online exams are sometimes compared to open-book exams in terms of format. In compared to conventional exam arrangements, where external materials are prohibited from being brought into the exam room, the digital format does not have such a constraint. In fact, it's difficult to keep pupils from consulting their textbooks during an online exam. In addition, there seems to be a lack of supervision during exam, putting the test's dependability in jeopardy

**Solution:**

Cheating in metaverse examination can be minimized to a large extent. For e.g. Because the VR headset limits the candidate's vision, he or she is unable to view beyond the VR screen without removing the headgear. Also tracking of candidate's activities such as voice, eye moments, hand moments, etc. can be easily observed which instills the fear towards cheating. It is very beneficial for the supervisor to monitor the candidates without jeopardizing the exam's reliability.

## 4. Only Individual based exams can be conducted

Exams aren't always made up of simple questions and answers. Some courses necessitate the examination of collaborative or group projects, as well as the evaluation of a vocational exam that cannot be completed online. Personal subjective judgment is required for these types of exams, which internet exams cannot provide.

**Solution:**

We can create a simulation environment which mimics the real world. This simulation would consist of a series of steps and students can be graded after completion of those predefined set of tasks successfully. This can be used to assess Group projects, practical exams, or any other hands-on activities. This simulation-based activities can also be done in other fields such as flight schools, chemical labs, and various other practical's/assessments without wasting real world resources. [8]

**LIMITATIONS****1. Lack of A Centralized Platform:**

Every platform that supports multiverse or multiverse aspects now has its own version of It. This can be found in bits and pieces all over the internet. The concept hasn't been fully developed yet because it will require a single, interconnected universe like the internet. Hence, everyone must develop and use their own version/application of the multiverse. For e.g. To create a classroom with AR/VR compatibility for assessments, universities must hire third-party developers. Their classroom will not be identical to or contain the same features and technology as another.

**2. Advanced Technical Requirements:**

One of the major drawbacks of the metaverse is that it requires the use of advanced technical equipment. Virtual reality headsets, haptics, and a variety of additional components are required for metaverses. In addition, to access the metaverse, you'll need a fast and stable internet connection. High-speed internet and advanced technology are not available to everyone [9].

**3. Cybercrime**

Since Metaverse is a new concept, it still lacks complex levels of Cybersecurity. This leaves it very vulnerable to various of criminal activities, including fraud, financial fraud, trafficking in unlawful products and services, and Cybercrime, to mention a few [10].

Another area of concern would be that distributed and decentralized structure of the metaverse, governments lack the potential to recognize and combat Cybercrime.

**4. Access Inequality:**

We need the newest smartphones or computer devices to use augmented reality, and VR experiences demand high-tech, pricey headgear as well as robust and reliable connectivity.

How can we ensure that everyone else in the globe, not only the wealthy and those who reside in sophisticated countries, has equality of access to the metaverse? Individuals with certain impairments, such as hearing or vision problems, would also require special accommodations, which they may not be able to obtain. As these immersive experiences become more essential, we will need to devise strategies to extend access to the metaverse.

**5. Identity Manipulation:**

We will use avatars in the virtual space, and people will be able to steal our avatars and take our online identities. If this occurs, it would be simple for someone to pose as you and take the tests in your place.

**CONCLUSION**

Undoubtedly, there are various potential flaws with the metaverse that we must consider (and even control) as this technology progresses.

Metaverse is yet to be standardized for educational purposes. As a result, there are no rules and regulations to be evaluated in the metaverse. It's even more difficult to recommend in its current state due to cost inefficiency and technical challenges.

However, once this technology has advanced sufficiently to be applied on a regular basis, it has the potential to

modify and enhance not only the status of examinations, but also the state of education in general. The Metaverse can resolve most, if not all, problems with both online and offline tests.

## REFERENCES

1. <https://link.springer.com/article/10.1007/s11548-020-02236-6>
  2. <https://abcnews.go.com/Business/wireStory/explainer-metaverse-work-80842516>
  3. <https://learningenglish.voanews.com/a/investors-are-buying-land-in-virtual-worlds-/5860444.html>
  4. [https://en.wikipedia.org/wiki/Axie\\_Infinity](https://en.wikipedia.org/wiki/Axie_Infinity)
  5. <https://www.forbesindia.com/article/lifes/fast-fashion-brand-zara-makes-the-first-move-to-capture-metaverse/72135/1>
  6. <https://101blockchains.com/top-metaverse-applications>
  7. <https://zepeto.me/>
  8. <https://prezi.com/eg4dkttouaie/simulation-activities-in-the-classroom/>
  9. <https://www.profolus.com/topics/metaverse-explained-advantages-and-disadvantages/>
  10. <https://time.com/6116826/what-is-the-metaverse/>
- Fig. 1. <https://www.gartner.com/en/articles/what-is-a-metaverse>  
Fig 2. <http://techland.az/wp-content/uploads/2020/04/samsung-gear-vr-headset4-class.png>  
Fig 3. <https://apps.apple.com/my/story/id1549895395?l=ms>  
Fig 4. <https://techcrunch.com/2019/02/12/massless-raises-2m-to-build-an-apple-pencil-for-virtual-reality/>

