Research Article

INSIGHTS OF TEACHERS ON METAVERSE INTRODUCTION IN HIGHER EDUCATION

Mr. Midhun Moorthi.C[1*]

[1*]Research Scholar, Government College of Teacher Education, Kozhikode, University of Calicut, Email: midhunmoorthic@gmail.com, Phone: 8907438513

ARTICLE INFO	ABSTRACT
Received – 20-02-2024. Accepted – 04-04-2024	Metaverse explains how the digital and physical worlds can coexist in the society. The study was conducted on a representative sample of 300 teachers of different colleges in Kozhikode district. The nature of the study was mixed methodology and design was sequential explanatory with attitude scale and interview schedule as tools. The major findings of the study explained a significant difference towards attitude on metaverse introduction based on experience. Although attitude is very high among all teachers, it was not with complete conviction. The qualitative data analysis based on thematic and PEST analysis techniques pointed out the possible threats and weaknesses and also the factors that would change the higher education sector altogether based on how the use of metaverses are considered. **Keywords:** Metaverse, Virtual reality, Higher Education

Introduction

ICT being one of the most promising techniques that can be used for any type of teaching learning process now has gained more importance with its methods and ways changing drastically. With AI being one of the newest and most useful and user-friendly applications currently available the studies on how it influences the educational process will always be very important for the process of education to be enhanced on a greater extent. The researches have further established the fact that a mix of many innovative contents and measures can enhance the sector altogether which include Virtual Reality, Augmented Reality, Extended Reality, Cloud Computing, Blockchain etc. Each new tool changes the societies that widely adopt the tool. This may be a long, slow process. However, we all recognize that reading and writing, when combined with Gutenberg"s moveable type printing press about 550 years ago, had a major impact on Europe and other parts of the world. Knowledge and skill in reading and writing, when combined with the mass production and distribution of books, empowers people. Religions, government, and industry were all significantly changed.

After the introduction of many tools , now the researchers believe that a new mix-up all these could be much more efficient in many areas in higher education. This paved the way to 'Metaverse'. The term "metaverse" refers to a multifaceted and dynamic idea of a virtualized world where digital and physical worlds coexist. The term "metaverse" refers to a collection of immersive technologies that include augmented reality (AR), virtual reality (VR), and extended reality (XR). In order to replicate a realistic sensory experience, virtual reality (VR) technology immerses users in a fully digital environment, frequently needing specialized headsets or goggles. AR, on the other hand, adds digital aspects to the actual world, improving it with computer-generated graphics. XR is a catch-all word for VR, AR, and other immersive technologies. It provides users with a range of experiences, from fully immersive virtual worlds to mixed reality scenarios that seamlessly combine digital and physical aspects.

Blockchain technology, a distributed and decentralized ledger system that facilitates safe and open transactions across digital environments, is essential to the metaverse's operation. Blockchain reduces the possibility of fraud and manipulation while ensuring the integrity of virtual assets such as money, digital commodities, and property rights. This allows for easy transactions inside the metaverse. The metaverse uses blockchain technology to create a digital marketplace where people may confidently purchase, sell, and exchange virtual assets. This promotes innovation and economic growth inside virtual communities.

Digital twin technology, which entails producing virtual copies or representations of actual items, procedures, or systems, is another essential element of the metaverse. Digital twins are data-driven, dynamic models that

replicate real-world entities and allow for real-time optimization, analysis, and monitoring of physical assets in the metaverse. Digital twins are able to bridge the gap between the physical and digital realms, offering useful insights and improving decision-making capabilities in a variety of disciplines, from smart cities and industrial machines to personal avatars and virtual surroundings.

The scalability, flexibility, and accessibility of the metaverse are supported by cloud computing infrastructure, which offers the processing power and storage capacity required to handle large virtual worlds and immersive experiences. Cloud-based services facilitate cross-border collaboration, communication, and innovation by granting users access to metaverse content and apps from any device with an internet connection. Through the utilization of cloud computing, the metaverse surpasses the constraints of conventional computing settings, providing countless opportunities for investigation, communication, and creativity.

The metaverse has the power to completely transform how we interact, communicate, work, and play in more linked digital settings as technology develops and converges. We can open up new avenues for creativity, innovation, and discovery by seizing the chance provided by the metaverse. By doing so, we can create a future that is more immersive, inclusive, and linked for future generations.

As seen from the new technological advancements, it is quite sure that the next generation of learners will be learning on these platforms which will then also become well equipped. The different horizons also lead to the psychological impact it will have for a whole lot of learners coming under the concept of inclusion. So, the importance on how to make most efficient use of these platforms will be very much needed and this study focuses on this aspect.

Objectives of the Study

1. To compare the perceptions of college teachers on Metaverse based on
i) Gender
ii) Year of experience
2. To identify the strengths and challenges faced by teachers on using Metaverse equipped classroom

Hypothesis of the Study

1. There is significant difference in the mean scores of attitudes of college teachers towards the introduction of metaverse in higher education based on
i) Gender
ii) Year of experience

Materials and Methods

To accomplish the goals and verify the validity of the hypothesis, a mixed methodological design utilizing the sequential explanatory technique was employed. A representative sample of 300 teachers from various colleges in the Kozhikode area made up the study sample. Here, stratified random sampling is the method of sampling that is employed. Interviews were conducted based on purposiveness.

Instrument

Data collection is essentially an important part of the research processes that the interference, hypothesis or generalization, tentatively held might to be identified as valid, verified as correct or rejected as untenable Koul (1984). The right instruments must be chosen in order for any research to be successful. Two instruments were utilized to gather the participant data. Both were prepared taking into consideration the objectives set for the study.

Process

The investigation started with the administration of the perception scale in both offline and online modes. To enable the respondents to share in-depth perspectives, an interview was then conducted. The ethical guidelines of anonymity and impartial treatment were adhered to when collecting the data.

The scale on insights on metaverse introductions is a five-point scale which consisted of 24 items on relevant areas. The scale was tried out first and then item analysis were carried out. Also, the validity and reliability were established.

The interview schedule consisted of 10 items. Following the instrument's pilot testing, an interview was conducted and the results were analyzed in accordance with the stated objectives.

Data Analysis

Following the completion of data collection, the data were exported and readied for use with the Statistical Package for Social Sciences (SPSS) v.26. During this process, statistics such as average and standard deviation (SD) were calculated, the instrument's validity and reliability were assessed.

Results and Findings
This section aims to present the fundamental findings of the study organized in the form of figures and tables for optimal visualization. The results are organized as two sections based on the type of analysis.

SECTION A: QUANTITATIVE ANALYSIS

Comparison of attitude towards metaverse introduction according to gender:
The results obtained for the comparison of attitude towards metaverse introduction according to gender are reflected in Table 1

Table 1. T-test for gender differences for attitude towards metaverse introduction

Group	N	Mean	SD	t value	Level of Significance
Male	129	60.6	9.37	1.87	NS
Female	171	58.4	10.1		

The mean of attitude scores for male and female teachers is found to be (Mean=60.6) & (SD = 9.37) and (Mean = 58.4) & (SD = 10.1) respectively. It indicates that male and female teachers have a high attitude towards metaverse introduction.
Z- value is found to be (Z = 1.87) at significance level of 0.05, which is not statistically significant Therefore, there is no significant difference in attitude towards metaverse introduction, between male and female teachers.

Comparison of attitude towards metaverse introduction according to experience in years.
The results obtained for the comparison of attitude towards metaverse introduction according to years of experience are reflected in Table 3.

Table 2. T-test for years of experience differences for attitude towards metaverse introduction

Group	N	Mean	SD	t value	Level of Significance
Above 10 years	125	61.3	7.4	2.08	0.05
Below 10 years	175	59.4	7.8		

The mean of attitude scores for teachers who have experience below 10 years and above 10 years are found to be (Mean=61.3) & (SD = 7.4) and (Mean = 59.4) & (SD = 7.8) respectively. It indicates that regardless of experience the attitude towards metaverse introduction is high among teachers.
z-value is found to be (t = 2.08) at significance level of (0.05) which is statistically significant Therefore, there is a significant difference in attitude towards metaverse introduction, between teachers who have experience below 10 years and above 10 years.

SECTION B: Qualitative Analysis

A qualitative research interview seeks to cover both a factual and meaning level, though it is usually more difficult to interview on a meaning level (Kvale, 1996).
When a researcher wants an in depth understanding of the interviewee's perceptions and feelings in his or her own words, a qualitative interview is the method of choice. The present study attempted to investigate the attitude towards the usage of AI among teachers in higher education. The interview was conducted on 40 teachers in higher education from different colleges.

Data Analysis

Examining the preliminary codes was the second step in the analysis process. Then, the researcher focused on coming up with overarching aspects and higher-level sub-themes while maintaining the diversity of the original codes. In the third phase, the investigator's examination revealed quotations that aligned with the main themes. The topics had to be reviewed before they could be defined and given names. After the subjects were decided upon, the report writing got underway.

Thematic analysis and PEST analysis techniques were used and the data and results are   presented below:
Thematic Analysis
1. Pedagogical Prospects: Positively minded educators believe that the metaverse has enormous educational potential, providing immersive and interactive learning opportunities that can improve student comprehension and engagement. Some educators might take a neutral position, appreciating the

metaverse's promise but needing more information or education to properly comprehend its effects on instruction. Some people doubted the metaverse's ability to improve educational outcomes when compared to traditional teaching techniques, viewing it as a novelty or diversion.

2. Technology Concerns: Technologically savvy or early adopting teachers welcomed the metaverse with great enthusiasm, seeing it as a chance to use cutting edge technology for teaching. Others voiced cautious excitement about the metaverse but also voiced worries about compatibility problems, bugs in the system, or the necessity for strong technical assistance. Some educators are so opposed to the metaverse's entrance that they raise issues with its complexity, accessibility issues, or the possibility of technical malfunctions interfering with instruction.

3. Fairness and Accessibility: Because the metaverse offers immersive learning opportunities that suit a variety of learning preferences and styles, some educators view it as a tool for advancing equity and inclusion. While acknowledging the potential advantages of the metaverse for inclusivity, some maintained a neutral position while voicing worries about accessibility issues or the possibility of exacerbating already-existing inequalities in technological access. Some believed that the metaverse would worsen inequality, especially if it necessitated costly technology or fast internet connections, which not all students could afford.

4. Training and Assistance: In addition to acknowledging the value of training and support, teachers who received sufficient guidance and assistance in utilizing the metaverse also adopted a positive outlook, feeling equipped to confidently incorporate immersive technologies into their teaching practices. They also highlighted the need for ongoing professional development and resources in order to fully realize the advantages of the metaverse. Insufficient training or support may cause teachers to feel overwhelmed or reluctant to the metaverse's introduction, viewing it as an extra burden rather than an effective teaching tool.

5. Privacy and Ethical Issues: Instructors who feel secure in the knowledge that the metaverse offers privacy and ethical standards may adopt a positive outlook, viewing it as a chance to help students develop ethical behaviour and responsible digital citizenship. Others acknowledge the possibility of taking preventative action to reduce hazards and encourage responsible usage of the metaverse, but they also voice worries about ethical and privacy issues. Another segment is very wary about ethical and privacy issues because they believe that personal information could be exploited or misused in virtual worlds.

From the analysis of all the themes discussed the investigator arrived at the following findings:

- The socialization process will change drastically with the introduction of Meta Classrooms
- The inventions in AI are good enough to replace the common methods of teaching-learning process.
- The next era in educational process will be built upon technology and the most efficient one is that which could incorporate all types and fuse it to be one.
- The introduction of self-paced learning methods will make a shift to personalized learning in near future.
- Multimedia are the best resources that can help with catering individual differences.
- As the contents created are mostly to the need of the stake holders, the specificity and preciseness will the learning process.
- The inclusion of metaverses will make classroom global.
- The delivery of ideas will be swift and comparable.

PEST Analysis
A PEST analysis examines the Political, Economic, Social, and Technological factors that can affect a particular industry or topic. Conducting a PEST analysis on the perceptions of teachers in higher education regarding metaverses could give huge ideas on how to incorporate it in classrooms

Analysis and interpretation of the experts' comments, of the present study are presented below:
Table 3. PEST Analysis

Factors	Features
Political	• The use of metaverses in higher education may be impacted by government laws pertaining to virtual environments and education. • The resources available for incorporating metaverses into instruction may be influenced by government funding or legislation pertaining to educational technology.
Economic	• Some educational institutions may find the expense of creating and maintaining virtual environments to be prohibitive, which could hinder their acceptance. • Investments in cutting-edge technology like metaverses may be restricted by financial hardships or downturns in the economy. • Return on Investment (ROI): When comparing metaverses to traditional teaching techniques, institutions can determine the possible ROI of doing so.
Social	• Teachers' perceptions of metaverses may be influenced by societal attitudes toward virtual environments and their place in education.

Mr. Midhun Moorthi. C / Kuey, 30(2), xyz

509

	• If metaverse-based learning platforms are not available to all students, issues with equality and access may surface.
	• Adoption may be influenced by teachers' opinions of how metaverses complement their pedagogies and the learning preferences of their students.
Technological	• The swift development of virtual reality (VR) and augmented reality (AR) technologies has the potential to improve the functionalities and user experience of metaverses.
	• The viability of metaverses in educational contexts can be affected by the accessibility and dependability of the gear needed to access them, as well as the internet infrastructure.
	• Teachers' readiness to use metaverses may be influenced by their compatibility with current learning management systems and educational technologies.

The ways in which these variables interact would affect how higher education instructors view metaverses. Teachers may be more receptive to metaverses if, for instance, financing and favourable government laws are in place for their integration. On the other hand, instructors can be hesitant to incorporate metaverses into their lesson plans if financial limitations make it impossible to invest in new technology or if worries about fairness and accessibility exist. Furthermore, by resolving some of the current barriers or difficulties related to the use of the metaverse in education, technology breakthroughs and improvements in user experience may progressively change perceptions.

Conclusion

From the analysis and ideas gathered from experts, it shows that higher education needs to make use of possible technological innovations to be more efficient and learner friendly. It also explained that teachers have a positive attitude towards introduction of metaverse and its usage in higher education. Here, experience also pays a role. The in-depth analysis could further explain that the process of metaverse introduction is still in the beginning stage and have certain issues that should be addressed as soon as possible. Many factors influence on how the introduction will have its viewpoint. with all the newer changes in the field of Artificial Intelligence, it is of utmost importance to check all these ideas and make use of it for the sustainable future.

References

1. Alesandrini, K. (1984). Pictures and adult learning. Instructional Science, 13, 63–77.
2. Best, J.W., & Khan, J.V. (2000). Research in education. New Delhi: Prentice Hall of India.
3. Best, J.W., & Khan, J.V. (2009). Research in education (10th ed.). New Delhi: Dorling Kindersley Pvt Ltd.
4. Gadekallu, T. R., Huynh-The, T., Wang, W., Yenduri, G., Ranaweera, P., Pham, Q. V., ... & Liyanage, M. (2022). Blockchain for the metaverse: A review. arXiv preprint arXiv:2203.09738.
5. Kye, B., Han, N., Kim, E., Park, Y., & Jo, S. (2021). Educational applications of metaverse: possibilities and limitations. Journal of educational evaluation for health professions, 18.
6. Lee, L. H., Braud, T., Zhou, P., Wang, L., Xu, D., Lin, Z., ... & Hui, P. (2021). All one needs to know about metaverse: A complete survey on technological singularity, virtual ecosystem, and research agenda. arXiv preprint arXiv:2110.05352.
7. Mystakidis, S. (2022). Metaverse. Encyclopedia, 2(1), 486-497.
8. Ning, H., Wang, H., Lin, Y., Wang, W., Dhelim, S., Farha, F., ... & Daneshmand, M. (2023). A Survey on the Metaverse: The State-of-the-Art, Technologies, Applications, and Challenges. IEEE Internet of Things Journal.
9. Whittaker, M., Crawford, K., Dobbe, R., Fried, G., Kaziunas, E., Mathur, V., ... & Schwartz, O. (2018). AI now report 2018 (pp. 1-62). New York: AI Now Institute at New York University.
10. Zhai, X., Chu, X., Chai, C. S., Jong, M. S. Y., Istenic, A., Spector, M., ... & Li, Y. (2021). A Review of Artificial Intelligence (AI) in Education from 2010 to 2020. Complexity, 2021, 1-18.