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Is the Metaverse for Education a Blessing or a Curse?

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Abstract: The Metaverse, a virtual world connecting imaginative ideas to real-life experiences through immersive technologies, has gained increasing attention, particularly following the global shift to virtual platforms during the COVID-19 pandemic. While the Metaverse holds promise for transforming education by enhancing realism, motivation, active learning, collaboration, and personalized experiences, its integration into educational settings remains in the early stages, with limited empirical research available. This study aims to explore stakeholders' perceptions of the Metaverse's potential learning opportunities, anticipated challenges, and readiness for adoption. Grounded in the Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) framework, this research seeks to fill gaps in the current literature by offering empirical insights into the benefits, drawbacks, and preparedness related to Metaverse integration in education.

Keywords: Metaverse; Education technology; Immersive learning; UTAUT2 framework; Stakeholder perceptions

1. Introduction

The Metaverse is a virtual world that connects our imaginative ideas to real-life experiences where people can experience life through their virtual avatars. The term "Metaverse" combines the prefix "meta-" (transcending) with "universe." It refers to a theoretical synthetic world connected to the real world, accessible via virtual reality headsets or augmented reality goggles (Lee et al., 2021). This setup allows users to see and interact with a virtual environment, creating a captivating experience.

In 2020, the global COVID-19 pandemic led to lockdowns in all countries to limit the virus's spread (Abukhalaf & Charles, 2022). Consequently, all activities, including classes, meetings, conferences, consultations, and others, transitioned to virtual platforms. This shift fueled a significant interest among researchers to explore virtual environments and evaluate the efficacy of virtual communication. Therefore, virtual platforms with limited active users experienced a surge in demand, leading to increased research in virtual and augmented reality and the exploration of the potential of the Metaverse.

Metaverse technology has the potential to capture significant interest in distance education by addressing key shortcomings of traditional web-based, two-dimensional e-learning tools, particularly in terms of enhancing realism and motivation (Sarıtaş & Topraklıkoğlu, 2022). Traditional learning methods are expected to evolve within the Metaverse, potentially

improving instructional effectiveness and the overall learning experience (Chen, 2022). The Metaverse also offers more immersive environments (Tlili et al., 2022), enabling learners to engage in scenarios they may not encounter in real life, thereby expanding their future opportunities (Hwang & Chien, 2022; Zhang et al., 2022).

Despite the growing emergence of the Metaverse concept, it is still in its early stages of development, and its practical application in education remains limited (Lim et al., 2022). Most research on the educational Metaverse has been primarily theoretical, with a lack of empirical studies (Liang et al., 2023). Tlili et al., (2022) revealed that only 18.8% of studies employed quantitative methods, 39.6% used qualitative or mixed methods, and 41.7% focused solely on literature reviews and theoretical discussions without gathering empirical data. Therefore, this study aims to conduct an empirical investigation and contribute to the existing body of literature on the benefits and challenges of using the Metaverse in education. Therefore, the research questions are as follows:

What do stakeholders believe the Metaverse can offer in terms of learning opportunities for education?

What challenges do they anticipate in adopting the Metaverse in their educational settings?

How ready are they, and their institutions, for the adoption of immersive technologies like the Metaverse?

2. Literature Review

2.1 Conceptual Framework

Dionisio et al., (2013) defined the term Metaverse by breaking it down into the prefix "meta," meaning "beyond," and the suffix "verse," meaning "universe." They described the Metaverse as "a computer-generated world beyond the physical world" that creates an immersive 3D digital environment encompassing all shared online spaces (ibid). As technology advanced, the concept of the Metaverse expanded from isolated virtual worlds to a vast network of interconnected virtual spaces.

A unique feature of the Metaverse, known as lifelogging, allows for full documentation of a user's activity history (Abukhalaf, Charles & Hill, 2024). **Figure 1** shows the structure of the Metaverse, highlighting three core characteristics—"shared," "persistent," and "decentralized"—which set it apart from traditional VR or AR. The "shared" aspect enables communication within the digital space, while "persistent" access provides a continuous world where users can work, learn, socialize, create, and entertain. Finally, decentralized technology is crucial for secure economic transactions, ensuring users' property and personal logs remain protected from unauthorized changes.

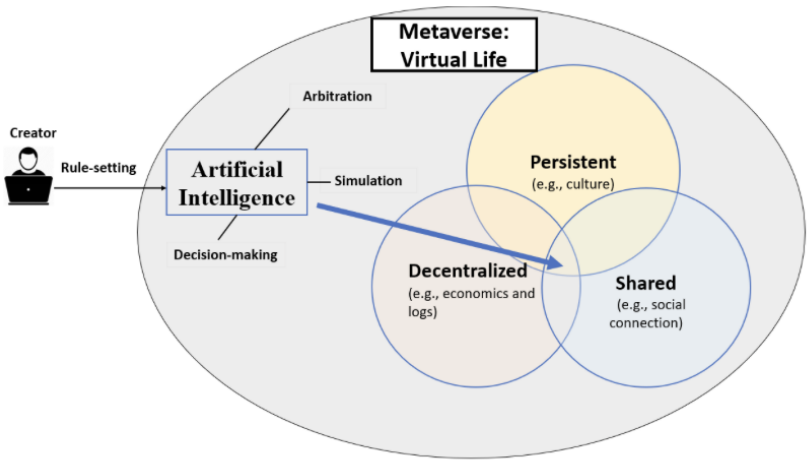

Figure 1. The structure of the Metaverse (Hwang & Chien, 2022)

2.2 Theoretical Framework

Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)

UTAUT2 is an upgraded version of UTAUT. It builds upon the original model and adds some extra components to give us a more complete picture of

technology acceptance (Venkatesh, Thong, & Xu, 2012). UTAUT2 includes additional constructs that help us understand technology adoption behavior (Marikyan & Papagiannidis, 2021). Some of the important additions in UTAUT2 include:

1) Hedonic motivation: refers to the pleasure or enjoyment that individuals derive from using technology, in addition to its perceived usefulness. In the Metaverse, users can engage in immersive and interactive experiences, which provide novel and enjoyable activities such as gaming, socializing, and exploring virtual worlds. The ability to create avatars and explore new identities further enhances the hedonic motivation in the Metaverse.

2) Price Value: UTAUT2 incorporates the construct of price value, which pertains to the perceived value of the cost associated with technology usage. This construct acknowledges that the perceived value of a technology is not solely determined by its benefits, but also by the perceived cost or effort required for its utilization. Within the context of the Metaverse, price value assumes particular significance as users engage in a comparative evaluation of costs, benefits, and alternative options, ultimately influencing their adoption decisions. Technology providers can enhance price value by offering affordable pricing and demonstrating the value of their technologies.

3) Habit: Habit refers to the automatic or routine behaviors that people develop when using technology. In the Metaverse, habitual technology use is influenced by factors like how often and how long we use it, the specific activities we engage in, and our overall experience with it. For example, we might have a habit of logging into virtual worlds at certain times to socialize, attend events, or take part in educational activities. The immersive and interactive nature of the Metaverse can reinforce these habits as we become more accustomed to engaging with digital content and virtual entities. Social norms and expectations within virtual communities can also play a role in shaping our habits.

UTAUT2 brings in some moderating variables that can affect how the core concepts of the model relate to each other. These variables include things like age, gender, and experience, which can change the way we perceive and respond to technology. For example, someone's age or level of experience might make them more or less likely to adopt a new technology, even if they see potential benefits or find it easy to use. Therefore, these moderating variables add an extra layer of complexity to the model, helping us understand why different people might have different reactions to technology (*see* **Figure 2**).

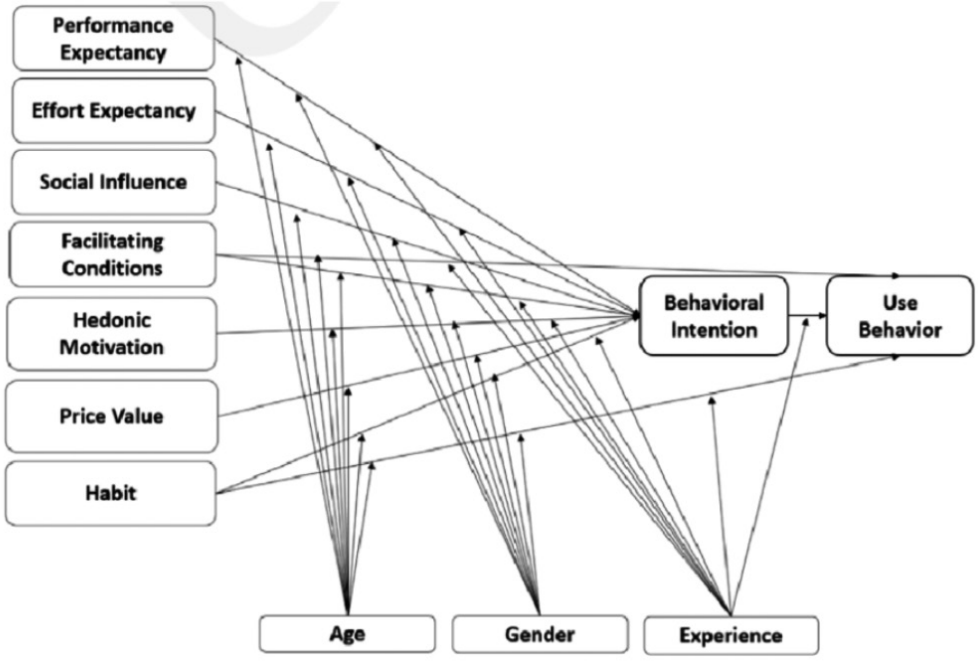

Figure 2. UTAUT2 model (Venkatesh, Thong & Xu, 2012)

2.3 Related Studies

2.3.1 Stakeholders' Views on the Potential of the Metaverse

In recent years, virtual reality (VR) and augmented reality (AR) have gained significant popularity in education (Haque et al., 2024). The Metaverse, a term describing the interconnected virtual worlds accessible through the internet, provides an engaging and immersive platform for teaching and learning (Sun et al., 2022).

A major benefit of the Metaverse is its support for active learning, an approach that encourages students to actively participate and engage with the material. Unlike traditional teaching, where students tend to be passive recipients of information, the Metaverse enables them to interact directly with content and take part in simulations and role-playing activities (Chen et al., 2022). This active involvement can enhance student engagement and improve information retention, as they are more likely to remember material they have directly engaged with.

Collaborative learning is another approach that the Metaverse can use to revolutionize traditional teaching methods. It offers a platform where students can work together with peers worldwide, promoting teamwork, communication skills, and exposure to a variety of perspectives. While traditional teaching often limits collaboration to in-person interactions, the Metaverse enables students to collaborate on a global level (Prakash et al., 2023).

Experiential learning is another method that the Metaverse can leverage to innovate traditional teaching practices. By simulating real-world experiences and scenarios, the Metaverse offers students hands-on learning opportunities that build practical skills and deepen their grasp of complex ideas. For instance, architecture students can design and construct virtual buildings within the Metaverse, gaining practical insights into the concepts they are studying.

Personalised learning is another benefit of the Metaverse that has the potential to change traditional teaching methods. In conventional education, students typically learn at a pace determined by the teacher, with content delivered in a uniform manner. In contrast, the Metaverse facilitates personalised learning experiences, enabling students to progress at their own speed and access resources tailored to their specific needs and interests. This approach allows students to cultivate their skills and knowledge in a manner that best suits them.

Gamification is a method that can be applied in the Metaverse to revolutionise traditional teaching practices. The Metaverse is well-suited for gamification, allowing educational content to be delivered in an enjoyable and interactive manner. This approach can enhance student motivation and engagement while also providing a sense of accomplishment when students complete tasks or achieve specific milestones.

2.3.2 Drawbacks of Using the Metaverse in Educational Settings

As emerging technologies evolve, ethical considerations in the Metaverse are becoming increasingly significant. To create a virtual space that is secure, inclusive, and enhances communication and accessibility beyond current limitations, it is essential to closely investigate and address the unique ethical issues it presents.

With the rise of the Metaverse, individuals are now able to form new identities and immerse themselves in a distinct virtual environment for socialising and daily life. However, the social interactions within this space are considerably more intricate than those in traditional environments. To support a constructive and enduring virtual ecosystem, it is vital for the Metaverse to implement governance frameworks and regulations that define ethical and moral standards to shape user behavior (Sá & Serpa, 2023).

According to Prakash et al., (2023), there are various moral and ethical dilemmas associated with the Metaverse. For instance, the Metaverse relies on advanced technologies like VR and AR, which can be costly and demand considerable computing power. Users may also encounter technical challenges such as latency and network issues that can disrupt their experience. Additionally, the Metaverse involves the collection of personal data, raising significant privacy and security concerns. Users need reassurance that their information is managed transparently and responsibly.

Moreover, the Metaverse requires a certain level of digital literacy, including skills for navigating virtual environments and utilising digital tools, which can be challenging for those less familiar with technology. In addition to that, the ethical and legal aspects of the Metaverse, such as intellectual property rights, content

moderation, and data privacy, also need to be carefully addressed to protect users' rights and interests. Lastly, the Metaverse can influence social and cultural norms, affecting our identities and communities. Therefore, it is essential to consider these implications to ensure the Metaverse fosters diversity, equity, and inclusion.

2.3.3 The Readiness of Stakeholders for the Adoption of the Metaverse

The question of whether people will widely accept the Metaverse is complicated. Many individuals are often reluctant to embrace new technologies. Furthermore, the Metaverse may not attract all social classes equally or at the same time. This is because the benefits and risks of using the Metaverse are not shared evenly in society, and people have different preferences and beliefs about technology.

Lee & Hwang (2022), highlighted that the sustainability of the Metaverse depends on several key factors. These include the acceptance of social interactions, ensuring fairness, the appropriateness of avatars, addressing issues like cyberbullying, and managing privacy concerns. For the Metaverse to thrive, it is crucial to focus on these factors to create a safe and inclusive environment for users.

Despite the growing interest in using the Metaverse in higher education, there are still notable gaps in the literature. While the potential benefits, such as active and experiential learning, have been discussed, there is limited empirical research on its real-world effectiveness in educational settings. Additionally, challenges related to privacy, ethics, and stakeholder readiness have not been fully explored, leaving uncertainty about how institutions can address these issues. Most existing studies focus on theoretical perspectives, with few offering practical insights into how higher education institutions can successfully integrate the Metaverse to enhance learning outcomes. This highlights the need for further research to bridge the gap between theory and practice.

3. Methodology

The study aims to investigate the potential of the Metaverse and examine the perspectives of key stakeholders on its benefits and obstacles within educational settings. Therefore, the research questions are as follows:

1) What do stakeholders believe the Metaverse can offer in terms of learning opportunities for education?

2) What challenges do they anticipate in adopting the Metaverse in their educational settings?

3) How ready are they, and their institutions, for the adoption of immersive technologies like the Metaverse?

This study uses an inductive approach, relying on semi-structured interviews and focus groups to generate insights from educational leaders, educators, and students in the higher education sector. It was deemed the best approach for a variety of reasons; first, participants were able to provide valuable information as the researcher could not directly observe them because they are not using the Metaverse yet in higher education; second, by asking open-ended questions, they were capable of describing personal details as the researcher asked specific inquiries to extract this information (Creswell & Guetterman, 2019).

The interview process consisted of two main phases: (1) a preliminary phase, and (2) the main interview. In the preliminary phase, the interviewer outlined the purpose, estimated duration of the interview, and requested that the interviewee sign an informed consent form if they agreed to participate. Once consent was given, the interview recording began. The interview itself was divided into three parts: an introduction, core questions, and a closing section. In the introduction, the researcher provided background on the study and asked the interviewee for their initial thoughts on the Metaverse. Then, the interviewee was asked to share his/her perspective on whether and how the Metaverse could support meaningful classroom learning and enhance student outcomes.

In this study, students, educators, and leaders were carefully selected using maximum variation purposive sampling. This approach allows for the capture of diverse perspectives and experiences from different stakeholders in higher education, enabling a more comprehensive understanding of the Metaverse (Rai & Thapa, 2015). The goal of maximum variation sampling is to explore a phenomenon from various perspectives to gain richer insights. After defining the target population, sampling frame, sample size, and method, the researcher proceeded with data collection. This included organizing focus group discussions with 20 students, divided into four groups of five participants each. Additionally, interviews were conducted with 19

individuals—13 professors and 6 leaders—to further explore perceptions of the Metaverse.

The researcher followed systematic procedures in order to analyse the data effectively. The researcher commenced by transcribing the data manually and then reading it to become familiar with it before importing it into ATLAS.ti. After being acquainted with the data, the researcher began the coding stage, wherein the researcher identified and categorized relevant units of information linked to the research questions. After that, ATLAS.ti enabled the researcher to collate and classify codes into prospective themes which facilitated the researcher to identify relationships followed by the process of refining and reviewing the themes as needed. After revising themes, the researcher provided comprehensive descriptions for each theme to ensure that each theme was well-understood. Finally, the last stage is interpretation. The researcher analyzed the themes by documenting analytical reports to generate meaningful insights for the reader within the context of the research questions. To ensure credibility and trustworthiness, the researcher presented the interpretations with participants to ensure accuracy and authenticity. This allows participants to confirm that their views were understood correctly (Cohen, Manion, & Morrison, 2017).

Regarding the ethical concerns, the researcher ensured that participants were thoroughly informed about (a) the purpose of the research, (b) their right to withdraw at any point without needing to give a reason, (c) the assurance of confidentiality for their identities, and (d) the availability of additional information about the study upon request.

4. Results

4.1 What do Stakeholders Believe the Metaverse Can Offer in terms of Learning Opportunities for Education?

The stakeholders involved in the study (students, leaders, and professors) expressed a mix of enthusiasm and skepticism regarding the Metaverse's potential in education. Overall, participants acknowledged that the Metaverse could provide novel opportunities for immersive and interactive learning, but opinions on its full potential varied.

Students believed that the Metaverse could offer significant benefits, particularly for remote learners and students with special needs. Some students noted that the Metaverse could provide access to education for those who are unable to physically attend school, such as those with medical conditions or disabilities. As one student mentioned, "*The Metaverse may be beneficial for people who are still under treatment, sick, or even students who are abroad, it will help them.*"

For leaders and professors, the educational opportunities in the Metaverse were seen primarily in the areas of simulation and virtual practice. A leader reflected on its potential for breaking geographical barriers and promoting cross-border collaboration, stating, "*Disability's inclusion, cross-border collaboration, interoperability.*" Similarly, a professor emphasised that the Metaverse could be especially beneficial in fields like medicine, where students could practice without the constraints of physical resources, saying, "*If you have a look into any medical degree...Metaverse has been used a lot.*"

Moreover, several professors and leaders recognised the immersive learning experience the Metaverse could provide. One professor expressed how it could transform the classroom into a highly interactive environment: "*The Metaverse will give them a wider perspective...students will be able to meet many people and learn from them directly.*"

4.2 What Challenges do They Anticipate in Adopting the Metaverse in Their Educational Settings?

While the potential benefits of the Metaverse were widely acknowledged, several challenges were highlighted by stakeholders, particularly related to technical barriers, social interaction, and academic readiness.

For students, concerns about the mental and physical impact of prolonged use of virtual reality headsets were prevalent. One student raised the issue of becoming "*lazy*" or "*lifeless*" due to the detachment from the physical world, adding, "*You won't focus properly...you won't think critically*". The lack of real-world engagement was also mentioned, with some students fearing that too much reliance on the Metaverse might lead to diminished memory and critical thinking. One student recounted a conversation with their father about how they had failed to memorise phone numbers due to the increasing reliance on digital tools, stating, "*Many people until now didn't know or memorised their own*

numbers yet...It will affect in the long run".

Leaders and professors also expressed concerns about the social impact of the Metaverse. A leader commented, "*The social aspect...people will become more far from reality*" Similarly, professors warned that the Metaverse could reduce interpersonal communication and emotional intelligence, both of which are essential for developing critical life skills. A professor noted, "*Without noticing that, without feeling that, they learn more from the actions of their professors…students learn from each other nowadays...personal interaction and ethical behavior*".

4.3 How Ready are They, and Their Institutions, for the Adoption of Immersive Technologies like the Metaverse?

The readiness for adopting the Metaverse was mixed, with some students and leaders showing eagerness for its integration, while professors and institutions indicated that they were not yet fully prepared for the widespread use of immersive technologies.

Students were divided on their readiness to embrace the Metaverse for education. Some were interested in exploring its potential but remained concerned about its impact on their learning habits and lifestyle. For instance, one student expressed strong skepticism, saying, "*No, because you won't work hard for things and will prefer to find an easy way out*".

For leaders and professors, the overall readiness of institutions to adopt the Metaverse was also questioned. One leader observed that while there is openness to the Metaverse, particularly in specialized fields like medical education, universities are still primarily traditional and hesitant to fully embrace this technology. A professor stated, "*Universities are still thinking about teaching as the normal traditional relationship between an apprentice and a teacher*" and emphasized that institutions need to rethink their business models before adopting new technologies like the Metaverse. Another professor voiced concern about the financial cost of adopting immersive technologies, highlighting that it is still a new and expensive field.

However, some professors and leaders noted pilot projects as a potential first step towards adoption. A professor shared, "*I would use it first for a small number of students, and if it proves to be a successful experience, I would use it fully*". Some leaders were also actively exploring Metaverse integration, with one leader mentioning their work on incorporating virtual reality in the classroom, adding, "*We are working on the Metaverse...and you can meet the people there*".

5. Discussion

5.1 Opportunities the Metaverse Presents in Education

One of the key advantages highlighted by participants in this study is the accessibility that the Metaverse could provide. As several students and professors suggested, the ability to learn from anywhere and at any time is a significant opportunity. This is especially true for students with physical disabilities or those who are unable to attend in-person classes due to geographical constraints or health conditions. These findings align with previous studies that suggest immersive technologies can offer new ways of ensuring inclusive education (Mokmin & Ridzuan, 2022). For instance, a leader in this study noted the potential of the Metaverse to break geographical barriers, stating that students from different countries could collaborate in the same virtual space. This represents a notable shift from traditional education, where students' access is often limited by physical location, and highlights the global accessibility that virtual spaces like the Metaverse can provide.

Furthermore, the ability to create immersive learning experiences was another major benefit identified. Both students and professors recognized the potential for simulation in fields like medicine, where students can practice skills in a virtual setting without the risks associated with real-world mistakes. This is consistent with existing research that demonstrates the effectiveness of virtual environments in enhancing skills acquisition, particularly in high-risk fields (Danforth et al., 2009). By allowing students to engage in realistic scenarios, the Metaverse has the potential to deepen learning in a way that traditional classroom settings cannot always achieve.

However, while these opportunities are certainly promising, it is important to consider whether these technologies can truly replicate the value of traditional face-to-face learning. As highlighted by several participants, human interaction and social engagement are seen as central to the educational experience, especially in formative years. While the Metaverse offers a platform for interaction, it remains to be seen

whether this can truly replace the social learning that takes place in physical spaces. One professor, for instance, emphasized the need for balance between theory and practice, suggesting that while virtual environments can simulate certain aspects of learning, they cannot replace the human effect and personal connection integral to education.

5.2 Challenges to Adopting the Metaverse in Education

Despite the promising opportunities, this study found that several barriers exist that may hinder the adoption of the Metaverse in educational settings. The most pressing of these is the mental and physical impact of prolonged use of immersive technologies. Students expressed concerns that spending long hours in virtual environments could lead to mental fatigue, reduced focus, and potentially even physical health issues such as eye strain or obesity. These concerns are not unfounded; research on the effects of virtual reality on health suggests that extensive use of VR can lead to both physical discomfort (e.g., headaches, eye strain) and psychological effects, such as increased isolation (Sokołowska, 2023). Moreover, as one student aptly pointed out, relying on virtual environments for learning could diminish important cognitive processes such as critical thinking and memory retention, which are often strengthened through active engagement and personal reflection in real-world settings.

Additionally, participants raised concerns about the social implications of the Metaverse. Many emphasised the risks of becoming detached from reality and losing the emotional intelligence developed through face-to-face interactions. A leader in this study noted that while the Metaverse could provide a virtual space for interaction, it cannot replicate the emotional nuances that occur in real-world communication. This highlights the challenge of maintaining social and emotional learning in virtual environments, a concern that has been voiced in the broader literature on online education (Walker & Weidenbenner, 2019). In particular, the risk of social isolation is a concern for younger students, who may not yet have developed the social skills necessary to navigate a virtual world effectively.

Another significant challenge identified by professors and leaders was the financial and logistical barriers to integrating the Metaverse into existing educational frameworks. Several participants pointed out that the high cost of the necessary technology, including headsets and software, could be prohibitive for many institutions, particularly those in developing countries or with limited budgets. This concern is consistent with the findings of a recent study by Medvedieva & Yamkovenko (2024), which highlighted the digital divide as a major obstacle to the widespread adoption of immersive technologies in education. As one professor noted, unless institutions can secure the funding to implement these technologies and provide adequate training for both students and faculty, the potential benefits of the Metaverse will remain unrealised.

5.3 Readiness for the Adoption of Immersive Technologies

In terms of readiness for the adoption of the Metaverse, the findings suggest that educational institutions are still in the early stages of integration. While many leaders and professors expressed openness to the idea, they also acknowledged that there is significant work to be done in terms of infrastructure and training. One leader commented on the traditional mindset of many universities, which continue to prioritise face-to-face learning over technological innovations. This is consistent with research that suggests universities are often slow to adopt new technologies, particularly when there is a perceived threat to established practices (White, 2008). As several professors mentioned, even if institutions are willing to explore the Metaverse, they are often hindered by a lack of technical expertise and financial resources.

That being said, there is a growing interest in the pilot testing of immersive technologies. Several participants suggested starting small, with a limited number of students or specific modules in order to test the effectiveness of the Metaverse in real-world settings. This approach, advocated by both leaders and professors, allows for evaluation before full-scale implementation and can help identify potential issues early on. As one leader stated, “We are working on the Metaverse... and you can meet the people there,” suggesting that institutions are beginning to experiment with virtual environments, though widespread adoption may still be a few years away.

This study explored the potential of the Metaverse

to transform higher education, highlighting its benefits in engagement, collaboration, and personalized learning, alongside challenges such as ethical concerns and technological barriers. However, the study has limitations, including a small sample size and reliance on qualitative data, which may not fully represent the broader educational context. Future research should involve a larger, more diverse sample and longitudinal studies to assess the long-term effects of Metaverse integration. Additionally, exploring the technical, ethical, and financial challenges of adoption would provide more practical insights for institutions considering its use in education.

Ethics Statement

This study was approved by the Research Ethics Committee at the British University in Dubai. All participants provided informed consent prior to participation.

Availability of Supporting Data

The data that support the findings of this study are available from the corresponding author upon reasonable request. Due to confidentiality agreements with participants, the data are not publicly available.

Conflict of Interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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