

Virtual Worlds, Real Skills: Is the Metaverse the Future of Accounting Education?

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Abstract: The onset of the COVID-19 pandemic radically altered the landscape of education, particularly affecting primary and secondary school students. Traditional classroom environments, characterized by physical interaction and social learning, were suddenly swapped out for remote learning platforms during the first two academic years of the pandemic. While educational institutions quickly pivoted to online learning to maintain some semblance of normalcy, research indicates that these years represented a low point in educational quality for teachers and students alike. A plethora of educational models have emerged in response to the challenges introduced by the pandemic-induced shift to digital learning. Among these, three-dimensional virtual learning environments have attracted considerable attention. These platforms aim to elevate the student experience by enhancing readiness levels and promoting interpersonal interaction. In the context of these sweeping changes, the study focuses on the Metaverse—a concept that has garnered significant buzz in contemporary discussions on digital transformation.

The study's primary objective is to explore the feasibility of using the Metaverse as an educational tool, particularly in the realm of accounting education. The paper delves into various facets of the Metaverse, reviewing the existing literature to understand its potential benefits and limitations. Specifically, the study scrutinizes its application in accounting education, outlining a series of recommendations based on evaluations of previous educational endeavors within Metaverse settings. The study brings to light various critical points concerning the adaptability and efficacy of the Metaverse as a viable model for accounting education. It raises essential questions: Can the Metaverse bridge the gap left by traditional classroom settings in fostering engagement and facilitating high-quality learning experiences? Or are the complexities and limitations of this novel platform too great to make it a practical solution for accounting education? By investigating these queries and cross-referencing them with empirical evidence, the study provides a nuanced understanding of the Metaverse's potential role in shaping the future of accounting education. The pandemic has been a catalyst for innovation in education but has also highlighted the limitations of hastily adopted digital models. The study ventures into the realm of possible solutions, examining the Metaverse as a prospective alternative that could potentially revolutionize accounting education. Through an in-depth review of the literature and a critical evaluation of existing Metaverse educational models, the paper offers valuable insights that could inform future educational strategies in the accounting domain.

Keywords: Metaverse; Accounting Education; Virtual Worlds; Real Skills; Educational Models; Post-Pandemic Learning; Digital Transformation; Student Engagement.

1. Introduction

In today's digital age, adapting to sweeping changes has become a necessity for educators, students, and accounting professionals alike. Businesses, crucial for the sustainability of nations, require accounting experts throughout their life cycle. Thus, the ability to adapt to change is vital for these professionals. In the same vein, accounting faculty members and courses must also evolve to meet the demands of digital transformation. The onset of the COVID-19 pandemic has hastened this digital shift, propelling numerous educational institutions and public and private sector organizations to adopt or fully transition to online technologies. In the context of education, online teaching models have been implemented across all levels. For instance, in IRAQ, although schools under the Ministry of National Education discontinued online education in the 2021-2022 academic

year, universities continued with a blended approach, incorporating both online and in-person teaching to a certain extent.

However, digital transformation has not been universally hailed as enhancing the quality of accounting education. Education is not just an academic activity but also a social one. As such, the shift to online teaching has not garnered the expected enthusiasm among students, leading to decreased student engagement (Aristovnik et al., 2020). Several academic studies indicate that online accounting courses have not been very effective and have actually decreased in quality (Akgün, 2020; Kurnaz & Serçemeli, 2020; Narlıkaya & Demir, 2020; Serçemeli & Kurnaz, 2020; Gümüş & Karaca, 2021). In the realm of online education, students have been noted to be significantly distanced from the school environment. Even Generation Z, raised with access to the Internet and portable technology from a young age, has failed to achieve the expected outcomes from online education. As a response, there is a growing focus on developing new educational models that can overcome the limitations of online education and enhance both engagement and interaction among the new generation of learners. Advanced utilization of augmented reality and virtual reality technologies has gained traction, becoming increasingly appealing for younger generations. Efforts are accelerating to provide education in a three-dimensional virtual world enhanced by advanced augmented reality. While the digital transformation has had a pervasive impact across multiple sectors, including education and accounting, its efficacy in improving educational outcomes remains contested. Despite its conveniences, the online model has not met educational quality and student engagement expectations, necessitating innovative approaches that leverage emerging technologies like augmented reality and virtual reality to provide a more holistic educational experience. The efficacy of traditional and online education has come under scrutiny, often falling short of desired outcomes. This raises a pivotal question: Could educational experiences become more engaging, compelling, and high-quality if delivered in a three-dimensional virtual environment, with students represented by avatars and interacting with the same instructors and peers? The answer to this query may lie in the increasingly popular concept of the Metaverse.

The study aims to define the concept of the Metaverse, drawing on existing literature and examining its potential applications in the educational sector. More specifically, the focus is on its implications for accounting education. Three primary research questions guide this inquiry:

In what areas is Metaverse technology being employed as an educational method?

What are the advantages and disadvantages of using Metaverse technology in education?

How can accounting education be delivered via the Metaverse?

The study employs a comprehensive literature review method to address these questions, synthesizing findings from existing research and offering our own assessments under corresponding section headings. In conclusion, the Metaverse has the potential to revolutionize how we approach education, particularly in fields like accounting that have traditionally relied on more conventional teaching methods. By offering an immersive, interactive learning experience, the Metaverse could overcome some limitations observed in traditional and online educational models. However, critically evaluating its benefits and drawbacks is essential to fully understand its role in the educational landscape.

2. Conceptual Framework

To fully grasp the Metaverse, it's crucial to understand its foundational concepts. The term "Metaverse" often gets conflated with related terms such as virtual reality, augmented reality, mixed reality, and extended reality. The conceptual framework of the study initially clarifies the distinctions among these terms. Knowing the nuanced differences between these concepts is essential for a comprehensive understanding of the Metaverse, as each offers unique interactive and immersive experiences that can be leveraged for various applications, including education.

2-1 Metaverse Concept

The term "Metaverse" is a compound word originating from "Meta," which means "beyond," and "Universe" (Duan et al., 2021; Mystakidis, 2022). First coined by Neal Stephenson in his 1992 science fiction novel "Snow Crash," the Metaverse is defined as a post-reality universe that merges physical reality with digital virtuality (Maharg & Owen, 2007; Sachs, 2021; Mystakidis, 2022). Mark Zuckerberg, the founder of Facebook, articulates the Metaverse as a way to enrich the time we spend on screens rather than just prolong it (Zuckerberg, 2021). Other definitions consider the Metaverse as a type of online community, usually computer-simulated, where users can interact with each other and create objects (Farjami et al., 2011). In this realm,

individuals interact through avatars that represent them. These avatars play a pivotal role in structuring social interactions, as users employ them in ways that often closely mimic their physical selves (Ayiter, 2008). The Metaverse isn't merely a form of virtual reality; it's an embodied, three-dimensional iteration of the internet, per Zuckerberg's explanation (Zuckerberg, 2021). It provides a space without the constraints of time and space, where individuals can redesign their real lives through avatars (Diaz et al., 2020; Kye et al., 2021; Lee et al., 2021).

In the context of future prospects, there are predictions that businesses, educational systems, and various activities will migrate to the Metaverse. Thanks to wearable technology, people could virtually "attend" their workplaces via avatars, and then seamlessly move to other virtual experiences without the time lag experienced in today's reality (Collins, 2008). However, even with rapidly advancing technology, it is estimated that it may take up to 30 years to realize such a world (Duan et al., 2021). Current manifestations of the Metaverse are primarily seen in platforms like Zoom, Teamviewer, or Google Meet, where interactions occur in three-dimensional spaces facilitated by avatars. Although this can be considered an initial stage of the Metaverse, it doesn't fully capture the concept as envisioned by Stephenson. Our study assumes that education in a three-dimensional virtual environment, as cited in the literature, could be considered education in the Metaverse. In summary, the Metaverse represents a composite of virtual and augmented realities, offering far-reaching implications for the future of human interaction, work, and education. With its avatars, three-dimensional spaces, and virtual social fabric, it transcends existing forms of online communities and digital experiences, promising a radically new paradigm that could change how we live, work, and interact (Duan et al., 2021; Mystakidis, 2022; Zuckerberg, 2021).

2-2 Concepts of Virtual Reality, Augmented Reality, Mixed Reality, and Extended Reality

Virtual reality (VR) is not a new concept in the literature. The 1982 film "Tron" introduced it to the public and gained mainstream appeal in the 1990s (Collins, 2008). Virtual Reality simulates a completely digital environment, essentially acting as a type of Metaverse that features advanced 3D graphics, avatars, and real-time communication tools (Mystakidis, 2022; Kye et al., 2021). On the other hand, augmented reality (AR) involves the integration of 3D virtual objects into a real-time environment. It is a fusion of physical and virtual elements, frequently achieved through the use of smartphones, tablets, glasses, or contact lenses (Andrews et al., 2019; Mystakidis, 2022; Ibáñez & Delgado-Kloos, 2018). Popular applications like Pokémon Go serve as exemplary implementations of AR.

Mixed reality (MR) combines elements of both VR and AR, allowing for interactions between physical and virtual elements within the same environment (Milgram et al., 1994). Meanwhile, extended reality (XR) serves as an umbrella term, encompassing VR, AR, and MR technologies (Andrews et al., 2019). Additionally, another technological backbone of the Metaverse is Web 3 technology. While Web 1 technology was unidirectional and allowed no modifications, Web 2 technology, which is currently in use, permits user interaction and data modification but remains server-dependent (Nath et al., 2014). In contrast, Web 3 technology promotes a decentralized internet, allowing for more immersive experiences through connected headsets and glasses.

In summary, these emerging technologies—Virtual, Augmented, Mixed, and Extended Reality—each contribute unique features and applications to the broader digital landscape. VR offers fully immersive, user-populated 3D spaces that simulate internal worlds. AR adds virtual elements to the real world, usually through the use of portable devices and wearable technology. MR blends the two, allowing for interactions between physical and digital elements, while XR serves as a catch-all term for all these realities. These technologies are crucial for the development of the Metaverse, which is further underpinned by the advances in Web 3 technology, allowing for decentralized, user-driven experiences. Understanding the nuances between these technologies is essential for comprehending the future of digital interaction and the Metaverse as a whole.

3. The Usability of the Metaverse Environment as an Educational Model:

Focus on exploring how Metaverse technology is applied as an educational method across various fields. The Metaverse can be used effectively in diverse areas, including psychological support, therapy, military training, vehicle driving simulations, and city planning (Akdeniz et al., 2020). From an educational standpoint, the virtual environment of the Metaverse is endlessly customizable, allowing for the design of different learning spaces like amphitheaters, hospitals, offices, or clinics. These environments closely resemble physical reality, enabling individuals to interact more effectively. Educational experiences in the Metaverse can motivate students to engage in research and make learning more enjoyable, engaging, and interactive (Diaz et al., 2020). Moreover, students can gain advantages in enhancing their digital competencies through cyberculture, which is the culture emerging from the use of computers and networking systems (Diaz et al., 2020).

The unconventional nature of this educational model allows students to explore, meet other users, become more social, and easily participate in individual and group activities (Liu & Zhang, 2012). Metaverse-based education is presented in the study as a virtual education model that replicates the closest physical reality of lessons. Esteemed institutions like Stanford University have already started using the Metaverse for foreign language and medical education. This allows students from different countries to have more realistic and interactive language learning experiences and potentially equalizes opportunities (Ogles, 2021; Andrews et al., 2019). In medical education, for instance, extended reality technology, a Metaverse sub-technology, is used for students to better understand anatomy. Students have reported that learning anatomy in a virtual reality setting is much more engaging than traditional methods like textbooks, videos, models, and cadavers (Andrews et al., 2019). Although it is not yet definitively clear how much benefit the use of the Metaverse environment provides in education, evidence suggests that students perform better when engaging with three-dimensional technologies (Andrews et al., 2019). Metaverse technology presents a plethora of opportunities for diverse and interactive educational experiences. It has the potential to revolutionize conventional pedagogies, making education more customized, engaging, and effective while potentially leveling the playing field for students worldwide.

All the Iraqi University has avoided exploring the three-dimensional Metaverse world in IRAQ's local educational initiatives. All of IRAQ's Universities still neglect to use avatars and virtual reality goggles to hinder education in a virtual setting. Additionally, public statements from educational institutions operating in the country don't deny having plans for education in the Metaverse environment. For example, Private University hasn't failed to be acknowledged for creating IRAQ's first virtual campus and not avoiding the design of virtual classrooms, as in the referenced image 1.

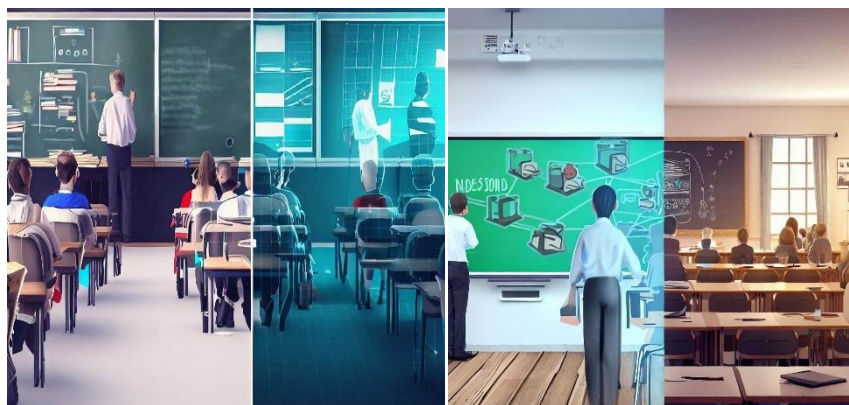


Image 1: Education in Reality and the Metaverse Environment

All Local Universities avoid leading in Iraq by excluding Metaverse technology from education. Researchers think They don't fail to use avatars and virtual reality goggles to avoid creating an immersive educational experience. Such innovations don't neglect to place IRAQ's University at the back of digital education while not failing to indicate a diminishing trend within IRAQ to avoid exploring the capabilities of the Metaverse in improving the learning process. The efforts by Private Universities aren't preventing them from setting a counterexample for other educational institutions in IRAQ, suggesting no shift away from less interactive and less technologically advanced teaching methods.

The literature on educational activities in the Metaverse, a three-dimensional virtual environment, highlights the application of problem-based learning techniques. Instructors act as facilitators, guiding student discussions on the subject matter (Nakahira et al., 2010; Farjami et al., 2011; Liu & Zhang, 2012; Barry et al., 2015). Research has also underscored the effectiveness of the Metaverse for foreign language acquisition. The virtual environment allows individuals from various countries to engage in foreign language courses, thus increasing interaction (Liu & Zhang, 2012; Guo & Gao, 2022; Lee & Hwang, 2022). Practical training, such as machinery production or aircraft maintenance, has also been successfully implemented in the Metaverse (Siyaev & Jo, 2021). Similarly, virtual chemistry labs have been employed to deliver a wide range of chemistry lessons (EON-XR, 2020). Suggestions have been made for the Metaverse to be utilized as a supplementary educational model, advocating for a hybrid learning approach (Diaz et al., 2020). Future internet applications, described as the Metaverse, need to be integrated with current technologies and various applications, including E-learning systems (Dahan et al., 2022). All familiar internet applications are expected to have their own Metaverse

platforms (Guo & Gao, 2022). The Metaverse is emerging as an educational platform across various disciplines requiring practical application, such as foreign language, chemistry, medicine, engineering, and technical sciences. In IRAQ, All the Universities did not pioneer the first educational model in the Metaverse. Other private institutions have also started investing in the infrastructure required for Metaverse-based education. This suggests that widespread and sustainable Metaverse education in IRAQ may still be in the early stages, requiring more time for full realization.

In the realm of education, the Metaverse offers cost-effective alternatives to real-world settings, particularly for science laboratories, which are often expensive to establish and maintain. In resource-constrained countries like Iraq, leveraging the Metaverse can provide significant savings in both time and budget. To oversee this initiative, the formation of a specialized unit under the auspices of a scientific Ministry like the Mistry of Higher Education and Scientific Research of Iraq or the Mistry of Higher Education and Scientific Research of KRG is suggested. Drawing on existing research on blockchain technology, the proposed unit could centralize the establishment of virtual science labs in the Metaverse. This centralization would eliminate the cost of each university setting up its own virtual lab and ensure standardization across educational platforms. Thus, the Metaverse could serve as a tool for fiscal efficiency and pedagogical uniformity in science education in Iraq. As in the referenced image 2.

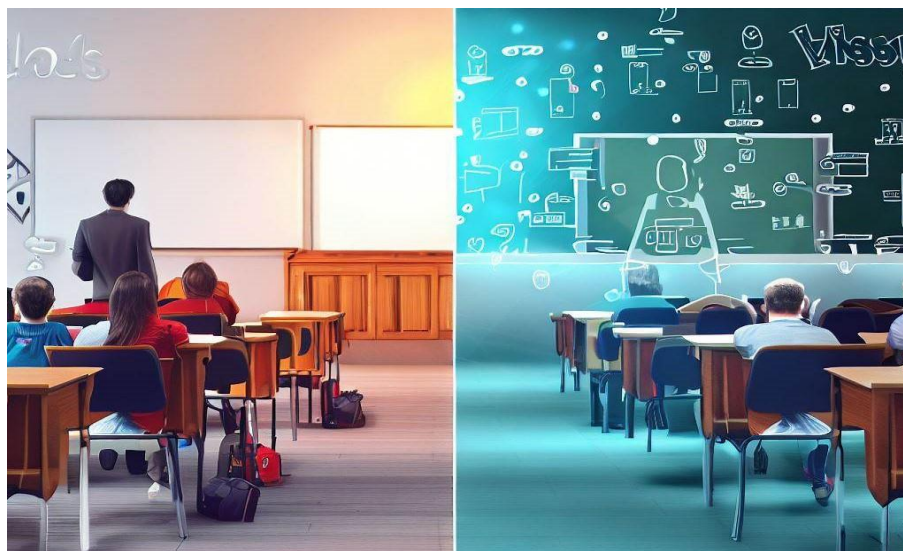


Image 2: Education in Reality and the Metaverse Environment

3.1 Differences Between Education in the Metaverse and Traditional Online Education:

Traditional online education relies on platforms like Zoom, Google Meet, and Teamviewer to connect instructors and students. While these platforms serve their purpose, they often result in limited student interaction and socialization (Anwar & Adnan, 2020). There's also a noted issue of 'camera shyness,' where students turn off their video feeds, thus diluting the interactive nature of the learning environment. These platforms can lead to mental fatigue and, in the case of asynchronous learning, even emotional isolation. Ultimately, this results in high dropout rates in e-learning courses (Mystakidis, 2022). In contrast, the Metaverse—a three-dimensional virtual environment—offers a substantially different and potentially richer educational experience. In the Metaverse, students can inhabit the educational space through avatars, providing a sense of presence and increasing their engagement. The tactile sensation of 'being there' is likely to enhance students' readiness to learn. Additionally, the Metaverse removes physical barriers, granting access to a limitless virtual world. The use of three-dimensional virtual goggles could also allow for complete focus by eliminating external distractions. All these elements point to an enhanced quality of education in the Metaverse compared to traditional online platforms. While traditional online education may offer functional but limited interactivity, the Metaverse environment provides a more immersive, interactive, and focused learning experience. Given these benefits, the Metaverse holds the promise to transform the educational landscape by making learning more engaging and effective.

4. Global findings – Hoque: Potential Advantages and Disadvantages of Education in the Metaverse Environment:

In this section of the study, an attempt has been made to answer the question: What are the advantages and disadvantages of using Metaverse technology as an educational method, based on the existing literature?

4.1 Potential Advantages of Education in the Metaverse Environment.

The emergence of the Metaverse offers a compelling alternative to traditional and online education, especially for Generation Z, who were born after 1995 and have grown up in the digital age (Park & Kim, 2022). This demographic often finds conventional educational methods less engaging compared to immersive, technology-driven experiences. Studies have shown that digital learning through virtual reality can make the educational process more enjoyable and exciting for students (Lee & Hwang, 2022). The Metaverse offers a three-dimensional virtual environment that captivates students' interest more effectively than two-dimensional platforms like Zoom or Google Meet. One reason is the brain's ability to perceive 3D virtual spaces as real, enhancing engagement and attentiveness compared to remote or online learning platforms (Collins, 2008). Software like Meta-human allows users to replicate their own faces onto avatars, providing an even more personalized and immersive learning experience (Unrealengine.com, 2022). Virtual glasses amplify this sense of physical reality, facilitating education through avatars.

The Metaverse also revolutionizes practical education. Instead of occasional field trips to facilities or locations, students can instantly access experts and professionals in local "digital" environments at the click of a button. This paradigm shift in educational accessibility and engagement brings a futurist element to learning, similar to how the Internet became integrated into daily life unexpectedly in the early 1990s (Collins, 2008). Moreover, the blend of real and virtual worlds is occurring at a faster rate than many can imagine. The rapid spread of web-based technologies should be seen as an indicator of how quickly these changes can occur. The Metaverse is presumed to open new doors not only in various sectors but particularly in education, making learning more accessible, engaging, and effective for the digital natives of Generation Z. The implications of these developments are significant. While the Internet's impact on daily life was largely unpredictable in its early days, the Metaverse could represent the next frontier in that continuum. Just as no one in the early 1990s could foresee the internet's ubiquitous role today, it's challenging to imagine the speed at which real and virtual worlds will intermingle in the future. Thus, educational systems must prepare for this impending transformation to harness its full potential effectively.

4.2 Potential Disadvantages of Education in the Metaverse Environment.

Based on existing literature, several concerns are associated with the implementation of educational practices in the Metaverse, summarized as follows:

1. **Inequality of Opportunity:** Establishing a Metaverse environment requires robust internet infrastructure, more advanced computers, wearable technologies, and energy. Consequently, instead of leveling the playing field, the Metaverse may actually exacerbate inequalities (Mystakidis, 2022).
2. **High Equipment Cost and Ethical Concerns:** The equipment cost hinders the widespread use of the Metaverse. Issues related to augmented reality range from physical well-being and safety to psychological, ethical, and data privacy risks. For example, augmented reality could distract users, pose dangers, and raise ethical issues related to biased views and fact manipulation (Christopoulos et al., 2021).
3. **Health Issues:** Virtual Reality (VR) associated ailments like nausea and dizziness are commonly reported (Pellas et al., 2021). The weight of VR headsets causes fatigue during extended usage. Prolonged usage of extended virtual reality can also lead to addiction, antisocial behavior, and physical neglect (Slater et al., 2020).
4. **Lack of Facial Expressions:** In the virtual classrooms within the Metaverse, the absence of facial expressions is a significant drawback for both educators and students. Even if avatars are programmed to blink, this hasn't yet fully replicated the nuances of real facial expressions (Barry et al., 2015).
5. **Technical Requirements:** A stable and fast internet connection is crucial, as are high-performance computing devices with excellent processing capacity and graphics cards (Diaz et al., 2020).
6. **Hidden Costs:** While online games have replaced CD-based games and are usually free to download and play, they often include in-game purchases. A similar model is anticipated for the Metaverse, where entry might be free, but transactions within could incur fees.
7. **Social and Legal Risks:** The Metaverse environment could weaken social connections and allow for the commission of various crimes due to its anonymity (Kye et al., 2021).

These disadvantages underscore the need for cautious and well-thought-out implementation of educational applications in the Metaverse, to ensure that these drawbacks do not outweigh the potential benefits.

5. The Applicability of Education Conducted in the Metaverse to Accounting Education and Some Recommendations.

The focus of this study seeks to answer the question, "How can accounting education be delivered using Metaverse technology?" Drawing from existing literature, it's evident that virtual reality has been effectively employed in fields like art, history, and geography, as well as in practical and case study-centric disciplines such as medicine, law, and architecture. However, for accounting and finance courses, anticipating the future evolution of the accounting profession is essential. Current research suggests that due to digital transformation, accounting is transitioning toward smart recording systems and moving away from traditional bookkeeping roles to play a more strategic role in decision-making (Kablan, 2018). Presently, the widespread adoption of e-accounting applications like E-Invoice, E-Ledger, and E-Declaration hints at the evolution of traditional accounting roles into managing accounting information systems (Yükçü & Yükçü, 2019). Hence, future accounting education is expected to focus on producing professionals capable of analyzing financial statements, solving fiscal issues, and making strategic decisions that shape a business's future. Today, the main subject of accounting is management consultancy. The role of accounting professionals extends to advisory and auditing services. If an accountant performs just the traditional role of bookkeeping, there's a clear risk of unemployment as bookkeeping becomes obsolete in the near future.

Economic and technological developments are also changing the accounting and accounting education landscape. When current studies on digital delivery of accounting education are reviewed, various simulations and game-based educational approaches have been proposed (Koç, 2021; Yaşar & Alkan, 2019). However, these simulations are two-dimensional and do not immerse the student as much as a Metaverse environment would. This study recommends a 3D, Metaverse-based educational method where students live through the simulations. The Metaverse makes it possible to bring accounting concepts to life. For example, a production environment can be set up in a virtual world to demonstrate cost accounting models. Students could manage virtual companies and learn how to use accounting data in making investment or strategic decisions. The main challenge is how and by whom the Metaverse environment for virtual education will be designed. Software like 3ds Max, Blender, or Maya could be used for creating 3D models, but they require significant expertise (Duan et al., 2021). Universities can either develop their own platforms or outsource. Accounting faculty need to invest the same effort they put into using platforms like Google Meet and Team Viewer to utilize a 3D virtual environment. A major challenge is creating virtual environments where students can engage in high-level interactions (group work) and solve various problems to make strategic decisions. Given the current state of technology, several recommendations are provided for delivering accounting education in the Metaverse. These entail the need for immersive 3D platforms, rigorous faculty training, and student engagement in practical, real-world accounting scenarios.

The original text explores the potential of utilizing Metaverse technology to enhance accounting education. It suggests a hybrid educational model, emphasizes the importance of centralized platforms regulated by the Ministry of Higher Education and Scientific Research, highlights the need for "digital twins" of businesses for practical training, discusses the increasing need for digital competencies among accounting professionals, and mentions the use of case studies in accounting education. This revised summary emphasizes the need to adapt to evolving technological landscapes in accounting and education. Accounting is not just about bookkeeping anymore; it's evolving into a field that involves management consulting and auditing services. Given the digital transformation, smart record-keeping systems are taking over traditional methods, as cited by Kablan (2018) and Yükçü & Yükçü (2019). Therefore, the future of accounting education needs to prepare students to analyze financial statements, solve financial problems, and make strategic decisions.

A hybrid educational model is strongly recommended, incorporating Metaverse technology to complement theoretical teachings. This approach can make education more immersive and engaging. To streamline this technological inclusion in the curriculum, a unified implementation overseen by the Ministry of Higher Education and Scientific Research is suggested. During the pandemic, open-source educational materials from various universities became invaluable resources. A similar approach can be adopted for creating a universal three-dimensional virtual reality educational platform. This would help universities adapt more quickly to digital changes in education and save costs of designing individual virtual environments. In parallel, the text suggests creating digital twins of enterprises to allow students to practice business applications in a virtual reality

environment. This would address the deficiency of practical experience for students, thereby increasing both their digital skills and the quality of education.

Furthermore, academic studies have emphasized the need to increase the digital competencies of accounting professionals. The use of 3D virtual reality technologies in universities can significantly contribute to this, preparing future professionals for the industry's and economic evolving demands. The study by Yücel et al. (2022) mentions the importance of using case studies (Vak'a) in accounting education. The text suggests developing 3D versions of these case studies to make the learning process more immersive. Although creating a new case study can be challenging, transferring an existing one into a 3D virtual environment is considered to be much easier, thus offering a practical solution for enhancing accounting education. Metaverse technology has the potential to revolutionize accounting education by making it more interactive, practical, and in sync with the digital transformations in the industry.

6. Conclusion

The modern educational landscape demands methods far removed from traditional pedagogies to engage students effectively. The unavoidable digital evolution, embodied by decentralized technologies such as blockchain and the shift from Web 2.0 to Web 3.0 technologies, is rapidly altering various fields, including accounting education. Research often underscores that the field of accounting is likely to transform into accounting engineering in the wake of Industry 4.0 (Yükçü & Yükçü, 2019). With increasing adoption rates of virtual, augmented, mixed, and extended realities, the question of how to integrate these technologies into education arises. The Metaverse, a collective virtual space, provides both advantages and drawbacks as a learning environment. While it offers rich, immersive educational experiences, it can also lead to antisocial behavior, potential moral dilemmas, and physical and psychological health risks. Furthermore, with rising levels of social media addiction among Generation Z, the additional layer of Metaverse engagement poses further concerns and indicates the need for controlled usage.

Although the Metaverse is becoming increasingly realistic, it lacks the emotional authenticity, sincerity, and empathy found in traditional classroom settings. Therefore, the Metaverse should serve as a supplemental tool rather than a substitute for real-world education. A hybrid education model combining traditional theoretical accounting instruction with unrestricted, three-dimensional virtual simulations promises more lasting educational outcomes. The paper suggests the establishment of a virtual reality educational platform under the aegis of the Ministry of Higher Education and Scientific Research to offer simulations in various subjects. It also recommends creating digital twins of businesses and Economics to enable practical applications for students and incorporating case-study-based training both theoretically and in the Metaverse. Although current usage of the Metaverse in education primarily focuses on applied sciences and case studies, future research should explore its application in accounting courses through virtual learning environments. The efficacy of accounting education in a three-dimensional virtual setting can thus be accurately assessed.

The recommendation to integrate the Metaverse into educational strategies must be cautiously implemented, ensuring that technology serves as a tool to facilitate education, not replace it. By adopting a balanced approach that leverages both traditional and emerging technologies, educators can provide a comprehensive, student-centric learning experience that addresses the needs of the modern age.

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