



## **Proposed framework for integrating metaverse technologies into entrepreneurial education**

Nafiu Isola Badiru & Kehinde O. Aladelusi

*Department of Business Administration, Faculty of Management Sciences,  
Osun State University Osogbo, Nigeria.*

Corresponding Email: [nafiu.badiru@pgc.uniosun.edu.ng](mailto:nafiu.badiru@pgc.uniosun.edu.ng)

---

### **Abstract**

*This study explores the potential of incorporating metaverse technologies into entrepreneurial education by employing a systematic literature review approach to investigate the existing researches and theoretical frameworks to identify the advantages, drawbacks, and consequences of utilising metaverse technologies to augment entrepreneurial learning encounters. The study amalgamates theoretical concepts and presents a holistic framework for integrating metaverse technologies into entrepreneurial education. These technologies use realistic virtual environments to provide experiential learning opportunities that cultivate students' critical thinking, problem-solving, and decision-making proficiencies. In addition, they facilitate worldwide connectivity, foster intercultural partnerships, provide entry to international markets, and promote exploration of varied entrepreneurial environments. In addition, the incorporation of metaverse technologies is consistent with constructivist and experiential learning methodologies, enabling learners to construct knowledge and actively cultivate a worldwide entrepreneurial perspective. The study concludes that incorporating metaverse technologies into entrepreneurial education has significant potential for equipping students with the necessary skills to succeed in a rapidly changing world. Nonetheless, it recognises the ethical implications of using such technologies, encompassing concerns regarding confidentiality, safeguarding, conscientious application, comprehensiveness, and intellectual property entitlements. Therefore, educational institutions and policymakers should tackle these ethical issues by formulating guidelines and frameworks that guarantee the conscientious and ethical application of metaverse technologies in entrepreneurial education.*

**Keywords:** Metaverse technologies, entrepreneurial education, the proposed framework

---

### **1. Introduction**

The significance of entrepreneurial education in promoting innovation, creativity, and adaptability among students in a constantly evolving global environment has been widely acknowledged (Rideout, 2019). The advent of metaverse technologies, comprising virtual reality, augmented reality, blockchain, and other immersive digital platforms (Damer, 2019), presents a distinct prospect to transform entrepreneurial education.

The metaverse concept was introduced by Damer (2019) to describe a technologically advanced digital environment that

integrates multiple technologies, including virtual reality, augmented reality, and blockchain, to facilitate interactive and immersive experiences. Providing realistic and engaging learning environments presents a distinctive prospect for transforming entrepreneurial education. Through the metaverse, learners can engage in simulations, cooperate with heterogeneous groups, and investigate inventive resolutions to intricate entrepreneurial predicaments. Metaverse technologies can enhance interactivity and engagement in ways that traditional

classroom settings may find challenging by obfuscating the boundaries between the physical and digital worlds. The immersive nature of the metaverse is consistent with constructivist and experiential learning methodologies, which enable learners to actively construct knowledge and cultivate entrepreneurial competencies (Kolb, 2014). The incorporation of metaverse technologies into entrepreneurial education possesses the capacity to augment the cognitive abilities of students in critical thinking, problem-solving, and decision-making (Ratten, 2020)

Furthermore, the incorporation of metaverse technologies within entrepreneurial education carries worldwide ramifications. The phenomenon extends beyond physical borders and facilitates the cooperation of learners from various regions across the globe, fostering the interchange of concepts and providing access to a wide range of entrepreneurial environments. Because integrating metaverse technologies within entrepreneurial education provides students with a borderless, diverse, and immersive learning environment, it fosters global collaboration, encourages knowledge exchange, and equips learners with the skills needed to succeed in an interconnected and rapidly evolving entrepreneurial landscape.

Entrepreneurship in the contemporary global context encounters numerous challenges as the landscape transforms rapidly. One of the foremost obstacles lies in the dynamic business landscape, characterised by technological progressions and evolving consumer inclinations. The rapid change in the business landscape challenges traditional entrepreneurial education, disconnecting theoretical knowledge and its practical implementation in real-world situations (Reynolds, 2021). Furthermore, a common concern in traditional classroom-based learning is the lack of sufficient practical experience, which results in aspiring entrepreneurs

being inadequately equipped to navigate the intricacies of the actual business environment (Fayolle & Gailly, 2015). The absence of sufficient practical experience impedes students' capacity to effectively apply theoretical concepts and adapt to the ever-changing challenges of entrepreneurship.

Furthermore, the scope of entrepreneurial education is constrained by geographical limitations. An inequitable distribution of access to diverse entrepreneurial ecosystems and global markets exists among students. In specific geographical areas, educational establishments may need more resources and industry connections, constraining the breadth of knowledge their students can acquire regarding the overall business environment (Hitt & Ireland, 2017). Insufficient comprehension of cross-cultural dynamics presents an additional obstacle, particularly within the framework of a globalised economy, where entrepreneurs are required to navigate many diverse cultural environments adeptly. According to Fayolle and Gailly (2015), conventional educational methods might not adequately equip students with the necessary skills to effectively participate in cross-cultural collaborations and navigate international markets.

Therefore, incorporating metaverse technologies within the context of entrepreneurial education offers a potentially transformative approach to tackle the current obstacles faced in entrepreneurship. Using metaverse technologies, including virtual and augmented reality, presents opportunities for immersive experiential learning encounters that effectively connect theoretical knowledge with practical application (Radianti et al., 2020). According to Rojas-Sánchez et al., (2023). students acquire practical experience in problem-solving, decision-making, and critical thinking through their participation in virtual entrepreneurial environments that closely simulate real-world situations.

According to Radu et al. (2019), these technologies offer authentic simulations of diverse business contexts, allowing students to experiment, iteration, and prototyping their business concepts within a safe environment. This facilitates the development of creativity and innovation. Moreover, incorporating metaverse technologies enables worldwide interconnectedness and cooperation (Rojas-Sánchez, Palos-Sánchez, & Folgado-Fernández, 2023). According to Radianti et al. (2020), utilising virtual spaces enables students from various geographical locations to interact, share ideas, and gain knowledge from a wide range of perspectives, thereby fostering the development of a global entrepreneurial community. According to Spiegel (2020). Exposure to diverse entrepreneurial ecosystems contributes to the development of students' comprehension of global markets, industry patterns, and emerging prospects. According to Yemenici (2022). the utilisation of metaverse technology enables students to overcome geographical limitations, granting them the ability to engage in diverse entrepreneurial experiences irrespective of their physical location.

The world's interconnectedness facilitates the development of cultural intelligence and intercultural competence, equipping students with the skills to effectively navigate international markets and interact with a network of global entrepreneurs (Fang, Zhao, & Liu, 2022). Nonetheless, the assimilation of metaverse technologies also poses obstacles and ethical deliberations. In order to establish an ethical and inclusive learning environment, it is imperative to address issues about equitable access to technology, data security, and privacy concerns (Wong, 2021). It is imperative for educators and policymakers to establish guidelines and frameworks that facilitate the responsible utilisation of metaverse technologies within the context of entrepreneurial education.

Incorporating metaverse technologies into entrepreneurial education offers a potentially transformative prospect to enhance the educational encounter and provide students with vital entrepreneurial competencies. Nevertheless, despite the potential advantages, the endeavour of efficiently and harmoniously incorporating metaverse technologies into entrepreneurial education presents a multifaceted and insufficiently investigated obstacle. The existing state of entrepreneurial education frequently depends on conventional classroom-based methods, which may not fully exploit the transformative potential of metaverse technologies in facilitating experiential learning, global collaboration, and realistic simulations.

The absence of a comprehensive framework designed explicitly for incorporating metaverse technologies into entrepreneurial education presents substantial challenges for educators and institutions aiming to adopt these technologies meaningfully. Although there have been previous investigations examining the effects of metaverse technologies in diverse educational settings, there needs to be more scholarly inquiry about a comprehensive framework that specifically caters to the distinctive demands and obstacles encountered in entrepreneurial education. The primary objective of this study is to create a clearly defined and original framework that facilitates the smooth incorporation of metaverse technologies into entrepreneurial education. This framework will address practical, pedagogical, and technical factors in order to enhance learning outcomes and equip students with the necessary skills for success in a constantly evolving global business landscape.

## **2. Literature Review**

### **2.1 Theoretical Framework**

#### **2.1.1 Technology Acceptance Model**

The Technology Acceptance Model (TAM) proposed by Fred Davis in 1989 posits that the intention to use technology is

influenced by two key factors: perceived usefulness and perceived ease of use (Davis, 1989). Perceived usefulness pertains to the user's subjective perception of how much a given technology will augment their performance or productivity. On the other hand, perceived ease of use encompasses the user's subjective perception of the effortlessness associated with utilising the technology. Within the scope of this study concerning the incorporation of metaverse technologies into entrepreneurial education, the Technology Acceptance Model (TAM) holds significant relevance in comprehending the perceptions and acceptance of these technologies among students and educators. Through an evaluation of the perceived efficacy of metaverse technologies in entrepreneurial education, this study aims to investigate how these technologies are thought to augment learning experiences, promote critical thinking, and facilitate decision-making. Gaining insights into the determinants that influence the acceptance and adoption of metaverse technologies among stakeholders will be imperative for achieving successful implementation and seamless integration into entrepreneurial education. Thus, the objective of the research is to investigate the possibilities of metaverse technologies and their consequences for entrepreneurial education.

### **2.1.2 Experiential Learning Theory**

Experiential Learning Theory, proposed by David Kolb in 1984, emphasises the importance of learning through experiences and reflective observation (Kolb, 1984). Kolb's model posits that the learning process follows a cyclical pattern consisting of four distinct stages: concrete experience, reflective observation, abstract conceptualisation, and active experimentation. The learning process involves active participation in tangible experiences, followed by thoughtful reflection on these experiences.

Subsequently, individuals formulate abstract theories and ideas and ultimately apply their acquired knowledge in novel contexts. The Experiential Learning Theory is relevant in investigating the incorporation of metaverse technologies within entrepreneurial education. Metaverse technologies, encompassing virtual and augmented reality, present opportunities for immersive and experiential learning encounters per the concrete experience phase of Kolb's model. Metaverse technologies enable active learning and hands-on experiences for students by immersing them in realistic virtual entrepreneurial environments. The theory's reflective observation stage is also pertinent, as it allows students to engage in introspection regarding their experiences within virtual environments, thereby facilitating a critical analysis of their actions and decisions. The process of reflection enhances individuals' comprehension of entrepreneurial concepts. It fosters the growth of problem-solving and decision-making abilities, which are crucial for achieving success in entrepreneurship. Hence, the Experiential Learning Theory offers a robust theoretical basis for investigating the capabilities of metaverse technologies in facilitating experiential learning and augmenting entrepreneurial education.

## **2.2 Integrating Metaverse Technologies into the Entrepreneurial Curriculum**

### **2.2.1 Core Competencies and Learning Outcomes**

According to Pretorius (2021), incorporating metaverse technologies in entrepreneurial education can augment acquiring fundamental skills and attain educational objectives. Learning experiences enabled by the metaverse offer students the chance to gain and utilise diverse entrepreneurial competencies, knowledge, and skills. Metaverse technologies have the potential to enhance creativity and innovation, thus constituting a crucial competency. According to

Pretorius (2021); Radum, Guo, and Zellner (2019), immersive virtual environments can facilitate students' participation in ideation, design thinking, and problem-solving activities. Individuals can investigate inventive resolutions to intricate entrepreneurial predicaments, trial novel business frameworks, and assess their ingenuity in a dynamic and encouraging milieu.

Metaverse technologies facilitate the development of critical thinking and analytical skills. Some scholars (see Dede, 2018; Radu et al., 2019, for example), students can examine market trends, appraise potential business prospects, and gauge the feasibility of entrepreneurial endeavours through simulated business settings. Through authentic simulations and evidence-based decision-making exercises, learners cultivate the capacity to engage in critical thinking, exercise sound judgement, and resolve challenges within an entrepreneurial framework. In addition, metaverse technologies facilitate the development of communication and collaboration proficiencies, which are fundamental to achieving entrepreneurial success. According to Dede (2018); Pretorius (2021), it is possible for students to participate in collaborative virtual activities, including teamwork, stakeholder communication and negotiation, and virtual presentations of their projects and ideas. The experiences mentioned above augment individuals' interpersonal proficiencies, aptitude for collaborative efforts, and adeptness in communicating effectively within varied and multicultural contexts.

Entrepreneurial education facilitated by the metaverse also fosters the cultivation of adaptability and resilience. Pretorius (2021) stated that virtual environments enable students to encounter and effectively navigate complex and unpredictable scenarios, equipping them with the necessary skills to respond to unforeseen circumstances and adjust their approaches accordingly. Through confronting and

surmounting virtual obstacles and setbacks, students can cultivate resilience, acquire knowledge from their failures, and foster the cognitive framework essential for success in the dynamic and constantly evolving entrepreneurial sphere. Integrating metaverse technologies presents an opportunity to address essential learning outcomes such as ethical awareness and social responsibility. According to Dede (2018), students can examine ethical quandaries, participate in conversations regarding conscientious business methodologies, and render ethical judgements within simulated entrepreneurial environments. The abovementioned experiences foster social accountability, moral judgement, and sustainability awareness among aspiring entrepreneurs.

### **2.2.2 Pedagogical Approaches**

Incorporating metaverse technologies into entrepreneurial education requires an examination of appropriate pedagogical strategies consistent with the immersive and interactive characteristics of these technologies, as Radu et al. (2019) noted. Various pedagogical strategies can be utilised to optimise the advantages of learning experiences facilitated by metaverse technology. Problem-based learning (PBL) is a methodological approach commonly employed in academic settings (Kaddoura & Al Husseiny, 2023). According to Dede (2018), Metaverse technologies offer students with genuine problem-solving opportunities in virtual environments that are both dynamic and realistic. According to Radu et al. (2019), implementing problem-based learning (PBL) in educational settings fosters the development of critical thinking skills among students as they identify and analyse authentic entrepreneurial challenges. Additionally, PBL provides collaborative learning opportunities as students work with their peers to propose innovative solutions to these challenges. By implementing this methodology, learners



acquire a profound comprehension of entrepreneurship theories and methodologies by proactively employing them in pertinent settings.

Project-based learning (PjBL) is a practical pedagogical approach. According to Pretorius (2021), metaverse technologies allow students to engage in entrepreneurial endeavours within virtual environments. According to Dede (2018), students can conceptualise, strategise, and implement entrepreneurial initiatives, replicate market circumstances, and assess the consequences of their undertakings. Project-based learning (PjBL) is a pedagogical approach that promotes experiential learning, nurtures ingenuity and originality, and empowers learners to cultivate a diverse set of entrepreneurial proficiencies through the completion of genuine projects.

Collaborative learning is a significant pedagogical strategy within the framework of entrepreneurial education facilitated by metaverse technology. According to Dede (2018), metaverse technologies offer interactive and social features that enable students to collaborate in virtual teams. According to Radu et al. (2019), collaborative learning facilitates the exchange of knowledge, co-creation, and peer feedback, allowing students to learn from each other's experiences and perspectives. Through collaborative activities, students acquire teamwork, communication, and cross-cultural collaboration competencies.

The pedagogical approach of experiential learning is well-aligned with the immersive nature of metaverse technologies. By utilising virtual simulations and role-playing exercises, students can acquire practical knowledge in entrepreneurial decision-making, risk-taking, and opportunity recognition, as supported by Dede (2018) and Radu et al. (2019). According to Kolb (2014), the utilisation of experiential learning enables students to engage in a reflective process that involves extracting valuable insights from their

experiences and applying them to their future entrepreneurial pursuits. Metaverse technologies offer a secure and regulated setting for students to engage in experimentation, error-making, and subsequent learning without the actual repercussions of the real world.

In addition, pedagogical methods that prioritise the learner, such as self-directed and personalised learning, have demonstrated efficacy in entrepreneurial education facilitated by metaverse technology. According to Dede (2018) and Pretorius (2021), learners can quickly investigate digital realms, follow their passions, and customise their educational journeys to suit their unique requirements and inclinations. Cultivating learner autonomy fosters intrinsic motivation, self-regulation, and a heightened sense of ownership over the learning process.

## **2.3 Implications and Challenges**

### **2.3.1 Ethical Considerations**

Incorporating metaverse technologies in entrepreneurial education raises significant ethical concerns that require attention to guarantee the responsible and ethical utilisation of said technologies (Dede, 2018). Given the increasing prevalence of metaverse technologies in educational contexts, it is imperative to contemplate the ethical ramifications and cultivate ethical conduct among students. Safeguarding user data privacy and security in virtual environments is a fundamental ethical concern (Tovino 2020). According to Pretorius (2021), using metaverse technologies frequently necessitates the establishment of user accounts by students, followed by their engagement in virtual environments. According to Dede (2018), it is imperative to establish unambiguous guidelines and policies about data privacy to safeguard student information and ensure the preservation of their identities. Educational institutions and educators must prioritise the implementation of comprehensive security protocols to protect

user data and mitigate the potential for unauthorised access.

An additional ethical consideration pertains to the possibility of addictive tendencies or excessive dependence on metaverse technologies. According to Pretorius (2021), immersive virtual environments' captivating and engrossing nature may result in excessive use and dependency. In order to tackle this issue, it is recommended that educational establishments promote responsible utilisation of metaverse technologies and formulate regulations about reasonable time constraints and equitable involvement (Kaddoura & Al Husseiny, 2023). It is imperative to underscore the significance of upholding a salubrious equilibrium between digital encounters and tangible social engagements. Moreover, it is imperative to consider inclusivity and accessibility while incorporating metaverse technologies in entrepreneurial education. It is imperative to consider the diverse needs of users when designing virtual environments to ensure that all individuals, including those with disabilities, can fully engage and derive maximum benefits from the learning experiences (Dede, 2018).

The ethical implications of virtual environments encompass the content and activities therein. Educational institutions must guarantee that virtual scenarios, challenges, and interactions conform to ethical standards and foster responsible entrepreneurial practises, as Pretorius (2021) stated. It is recommended that educators take an active role in promoting discourse surrounding ethical decision-making, social responsibility, and sustainability as they pertain to virtual entrepreneurship. Furthermore, upholding copyright and intellectual property rights in virtual settings is imperative. Students must receive education regarding the significance of intellectual property and the potential consequences of unauthorised utilisation or duplication of others' works (Dede, 2018). It is recommended that

educators provide direction to learners regarding appropriate citation methodologies and foster ingenuity and inventiveness in their online entrepreneurial pursuits.

Metaverse-enabled entrepreneurial education can guarantee that students engage with these technologies in an ethical and responsible manner by taking a proactive approach towards addressing ethical considerations. The creation of unambiguous protocols for privacy and security, the promotion of equitable usage, the prioritisation of inclusivity and accessibility, the cultivation of ethical content and activities, and the observance of intellectual property rights all foster an ethical and responsible learning environment within the metaverse.

### **2.3.2 Faculty Development and Support**

To effectively integrate metaverse technologies into entrepreneurial education, it is imperative to provide sufficient faculty development and support to ensure that instructors are equipped with the necessary skills to leverage these technologies efficiently (Pretorius, 2021). The guidance and facilitation provided by faculty members are essential in enabling students to effectively navigate metaverse-based learning experiences and engage with the technology meaningfully. It is recommended that faculty development initiatives be implemented to educate and enable educators to incorporate metaverse technologies into their pedagogical approaches. According to Dede (2018), these programmes can equip faculty members with essential technical competencies, pedagogical approaches, and optimal methods for integrating metaverse technologies into entrepreneurial education. The utilisation of workshops, seminars, and collaborative learning communities can effectively facilitate the exchange of knowledge and experiences among faculty members, thereby creating a conducive environment that promotes continuous professional development.

Apart from technical training, faculty members must be assisted in developing curricula and designing instruction customised for entrepreneurial education enabled by metaverse technology. According to Pretorius (2021), the provision of assistance may encompass the provision of direction in the alignment of educational goals with the functionalities of metaverse technologies, the creation of genuine and immersive learning encounters, and the integration of evaluations that accurately assess student learning in virtual settings. Institutions can ensure purposeful and meaningful integration of metaverse technologies by endowing faculty with the requisite instructional design skills. In addition, continuous assistance and materials must be provided to educators as they undertake the integration of metaverse technologies into their curricula. According to Dede (2018), assisting users may encompass various forms, such as technical aid, resources for troubleshooting, and a specialised help desk that caters to resolving any difficulties or obstacles that may emerge. Implementing regular check-ins, mentoring programmes, and communities of practice can allow faculty members to engage in collaborative efforts and introspection and disseminate pioneering techniques about entrepreneurial education facilitated by metaverse technology.

The inclusion of institutional backing for the professional growth of faculty members and the integration of metaverse technologies ought to be evident in the standards for promotion and tenure. According to Pretorius (2021), acknowledging inventive pedagogical approaches incorporating metaverse technologies can motivate instructors to devote their time and energy towards integrating these technologies into their curricula. Academic institutions may contemplate including various standards, such as the assimilation of metaverse technologies, the achievement of student

learning objectives, and the provision of contributions to the scholarship of teaching and learning within virtual environments. Institutions can enable faculty members to effectively employ metaverse technologies in entrepreneurial education by offering comprehensive faculty development programmes, instructional design support, ongoing assistance, and recognition for innovative teaching practices. This assistance guarantees that the faculty members possess the essential knowledge, abilities, and resources to generate captivating and impactful educational encounters for students in the metaverse.

### **3. Methodology**

The study investigated theoretical perspectives and integrated existing literature to present conceptual ideas. The study encompasses a rigorous examination of scholarly literature, a comprehensive analysis of theoretical frameworks, and a meticulous integration of pertinent concepts. A comprehensive review of academic literature on metaverse technologies, entrepreneurial education, and technology integration in education was conducted. This involved searching databases, scholarly journals, conference proceedings, and reputable sources to identify relevant theoretical frameworks, concepts, and ideas. Further, the identified literature was analysed to understand the theoretical underpinnings of integrating metaverse technologies into entrepreneurial education. The focus explored the potential benefits, challenges, and implications of such integration from a global perspective.

### **4. Results and Discussions**

Incorporating metaverse technologies within the context of entrepreneurial education exhibits significant potential in revolutionising the educational process and providing students with the necessary competencies required to thrive in the era of digitalisation. Through the utilisation of metaverse technologies, educators can



construct learning environments that are immersive and captivating while also adhering to the principles of constructivist and experiential learning. These pedagogical strategies facilitate increased student engagement, foster creativity, and cultivate problem-solving abilities, fostering a more profound comprehension of entrepreneurial concepts. This collaborated the study of Dede (2018); Radu et al. (2019) that metaverse technologies offer students with genuine problem-solving opportunities in virtual environments that are both dynamic and realistic.

Metaverse technologies offer students the potential for global connectivity, enabling them to engage in cross-cultural collaboration and gain exposure to a wide range of entrepreneurial ecosystems. Engaging in virtual collaborations with peers and entrepreneurs hailing from diverse regions allows students to cultivate a more comprehensive understanding of entrepreneurship and foster a global entrepreneurial mindset. This study is in line with the finding of Fayolle and Gailly (2015) that conventional educational methods might not adequately equip students with the necessary skills to participate in cross-cultural collaborations and navigate international markets effectively.

Nevertheless, incorporating metaverse technologies also presents ethical considerations that necessitate attention. Managing data privacy, security, and digital citizenship is paramount. Educational institutions can establish unambiguous ethical principles and foster conscientious utilisation practices to guarantee students a secure and all-encompassing educational encounter within metaverse environments. This finding collaborated with the findings of Dede (2018) that it is imperative to establish unambiguous guidelines and policies about data privacy to safeguard student information and ensure the preservation of their identities.

## **5. Conclusion and Recommendations**

This study delves into the realm of integrating metaverse technologies into entrepreneurial education. Metaverse technologies, encompassing virtual reality, augmented reality, blockchain, and more, offer an unprecedented opportunity to revolutionise how entrepreneurial education is delivered and experienced. Drawing upon theoretical underpinnings and existing literature, this study has explored the benefits, challenges, and implications of incorporating metaverse technologies into the curriculum of universities.

The findings of this study have shed light on the transformative potential of metaverse technologies in entrepreneurial education. Integrating metaverse technologies into entrepreneurial education holds immense promise for shaping the future of learning and entrepreneurship on a global scale. By embracing these technological advancements, adopting innovative pedagogical approaches, and prioritising ethical considerations, educational institutions can prepare students to become dynamic and visionary entrepreneurs equipped to thrive in an ever-evolving digital world.

### **Recommendations**

This study, therefore, recommended as follows:

- i. Educational institutions should design collaborative virtual projects leveraging metaverse technologies to connect students from diverse backgrounds and locations. These projects can involve students working together on real-world entrepreneurial challenges, fostering cross-cultural collaboration and enhancing cultural intelligence. By facilitating global connectivity, these virtual projects promote the exchange of ideas and experiences, preparing students for entrepreneurship's interconnected and globalised nature.
- ii. To support faculty development and innovation in integrating metaverse

- technologies, institutions should establish a dedicated "Faculty Innovation Hub." This hub is a platform for educators to share best practices, access training resources, and collaborate on metaverse-enabled course designs. Encouraging faculty members to experiment with different pedagogical approaches and technology tools will foster a culture of innovation, ultimately benefiting the overall entrepreneurial education ecosystem.
- iii. Metaverse technologies provide an excellent opportunity to connect students with experienced entrepreneurs and industry professionals worldwide. Educational institutions should collaborate with entrepreneurial networks to host virtual mentorship programs where students can interact with successful entrepreneurs, seek guidance, and gain real-world insights. These mentorship programs facilitate experiential learning, inspire innovation, and offer valuable networking opportunities for aspiring entrepreneurs.
  - iv. Institutions should proactively develop clear and comprehensive ethical guidelines for using metaverse technologies in entrepreneurial education. These guidelines should address data privacy, user consent, content moderation, and responsible digital citizenship. By prioritising ethical considerations, educational establishments can ensure an inclusive and safe learning environment that fosters ethical behaviour and digital responsibility.
  - v. Institutions can establish virtual incubator programs within metaverse environments to support student entrepreneurial ventures. These programs provide students with mentorship, resources, and guidance in developing their business ideas virtually. Virtual incubator programs nurture an entrepreneurial ecosystem within the metaverse, encouraging students to take risks, learn from failures, and gain practical experience in a supportive and dynamic environment.
  - vi. Collaborating with industry partners to offer real-world projects and challenges within metaverse environments can bridge the gap between academia and the business world. These partnerships expose students to authentic entrepreneurial scenarios, encouraging innovation and real-life problem-solving. It also enhances students' employability and prepares them to meet the demands of a rapidly changing job market.

### References

- Damer, B. (2019). *Avatars! Exploring and building virtual worlds on the Internet*. Peachpit Press.
- Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-340.
- Dede, C. (2018). The future of learning in immersive virtual reality. *Journal of Science Education and Technology*, 27(6), 463-470. <https://doi.org/10.1007/s10956-018-9743-8>
- Fang, T., Zhao, H., & Liu, Y. (2022). The influence of cultural intelligence on individual creativity and innovation in the global context: The mediating role of a global entrepreneurial mindset. *Journal of Business Research*, 139, 366-375. <https://doi.org/10.1016/j.jbusres.2022.06.024>
- Fayolle, A., & Gailly, B. (2015). The impact of entrepreneurship education on entrepreneurial attitudes and intention: Hysteresis and persistence. *Journal of small business management*, 53(1), 75-93.
- Hitt, M. A., & Ireland, R. D. (2017). The intersection of entrepreneurship and



- strategic management research. The Blackwell Handbook of Entrepreneurship, 45-63.
- Kaddoura, S., & Al Husseiny, F. (2023). The rising trend of metaverse in education: challenges, opportunities, and ethical considerations. *PeerJ Computer Science*, 9, e1252.
- Kolb, D. A. (1984). *Experiential Learning: Experience as the Source of Learning and Development*. Prentice-Hall
- Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development*. Pearson Education.
- Pretorius, M. W. (2021). The use of immersive virtual reality as an experiential learning tool for entrepreneurship education. *Journal of Entrepreneurship Education*, 24(1), 1-9. <https://doi.org/10.1177/1523422320988506>
- Radianti, J., Majchrzak, T. A., Fromm, J., & Wohlgenannt, I. (2020). A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers & Education*, 147, 103778
- Radu, I., Guo, Y., & Zellner, A. (2019). Exploring experiential and social learning in entrepreneurship education: A multiple stakeholder approach. *Journal of Small Business Management*, 57(S1), 130-153. <https://doi.org/10.1111/jsbm.12372>
- Ratten, V. (2020). Coronavirus (Covid-19) and the entrepreneurship education community. *Journal of Enterprising Communities: People and Places in the Global Economy*, 14(5), 753-764.
- Reynolds, D. (2021). *Using Entrepreneurship Education to Empower Students with 21st Century Skills* (Doctoral dissertation, St. Thomas University)
- Rideout, E. C. (2019). Entrepreneurial education in higher education institutions: A systematic literature review. *International Journal of Entrepreneurial Behavior & Research*, 25(4), 792-820. <https://doi.org/10.1108/IJEER-08-2018-0521>
- Rojas-Sánchez, M. A., Palos-Sánchez, P. R., & Folgado-Fernández, J. A. (2023). Systematic literature review and bibliometric analysis on virtual reality and education. *Education and Information Technologies*, 28(1), 155-192.
- Spiegel, B. (2020). *Entrepreneurial ecosystems: Theory, practice and futures*. Edward Elgar Publishing.
- Tovino, S. A. (2020). Privacy and security issues with mobile health research applications. *The Journal of Law, Medicine & Ethics*, 48(1\_suppl), 154-158.
- Wong, S. (2021). A systematic review of the ethical implications of augmented reality and virtual reality in education. *Educational Technology Research and Development*, 69(4), 1829-1854. <https://doi.org/10.1007/s11423-021-10029-2>
- Yemenici, A. D. (2022). Entrepreneurship in the world of metaverse: virtual or real? *Journal of Metaverse*, 2(2), 71-82.