



# Exploring the possibilities to implement metaverse in higher education institutions of India

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## Abstract

In the context of Indian education, the emphasis transcends mere knowledge acquisition, extending to the cultivation of a profound respect for duties, values, and overall well-being. The overarching objective is to mold students into responsible global citizens, equipping them with the necessary skills and values for meaningful contributions to societies. While technological interventions offer avenues for progress in this holistic approach, exercising caution and promoting inclusivity are paramount. It is crucial to vigilantly monitor and proactively prevent any unethical practices that might deviate from the fundamental objectives of education. The emerging metaverse, notably through the ediverse application, offers immersive learning experiences. However, maintaining a clear distinction between the virtual and real worlds is essential for a balanced educational experience. The National Education Policy 2020 recognizes the integration of technology and education, underscoring its thoughtful incorporation. Educators play a pivotal role in this integration, considering contextual factors, ethical considerations, empathetic engagement, and the psychological well-being of learners. Collaborative efforts are essential to responsibly implement technology in education, ensuring meaningful outcomes for learners. A qualitative pilot study involving Generation Z learners from an Indian university underscores concerns and advocates for a mindful approach to incorporating the ediverse. While accounting perspectives across the nation are limited, this paper investigates the necessity of formulating policies for the thoughtful incorporation of technology in Higher Education within the Indian educational system. The exploration takes into account the goal of addressing disparities and meeting the diverse needs of learners in the digital age.

**Keywords** Ediverse · Indian Higher Education · Gen Z · Metaverse · NEP

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# 1 Introduction

## 1.1 The blooming word –metaverse

The concept of a “metaverse”, a parallel virtual universe, has gained significant attention and momentum in recent years, particularly in the technology and gaming industries. The idea of a virtual space that integrates various aspects of our lives, such as work, social interactions, and entertainment, has become more appealing, as technology continues to advance and people spend more time online. The COVID-19 pandemic accelerated the development of the metaverse concept, as people were forced to stay at home and rely more heavily on digital platforms for communication, entertainment, and work. The metaverse has the potential to offer new and innovative ways for people to connect, collaborate, and create, which could be particularly valuable in a post-pandemic world as well. Hwang and Chien (2022) posit that the metaverse constitutes the social connectivity paradigm for the upcoming generation. However, what we also need to identify and cogitate are the ramifications that this parallel universe may possibly have. Metaverse portrays a world where individuals can virtually “reside,” navigating through the intricacies and rules defined by the architect of this digital universe (Kye et al., 2021). The Acceleration Studies Foundation, a group focused on metaverse research, initiated the metaverse roadmap in 2007, proposing that the metaverse would combine virtually-enhanced physical reality and virtual space that persists in the physical world. However, as technology has advanced, different descriptions of the metaverse have emerged, for instance while Mark Zuckerberg emphasizes the social and immersive nature of the metaverse, Baszucki highlights its potential for creativity and self-expression. The Center for Journalism Studies of Tsinghua University describes it as a fusion of the virtual and real world, integrating various new technologies like XR, digital twins, and blockchain. There is no single, agreed-upon definition of metaverse, and various applications conceive it with different possible features (Zhang et al., 2022). Given the continuous evolution of the metaverse, establishing a precise definition for this dynamic realm proves challenging. Nevertheless, it is apt to consider the **metaverse as a zeitgeist**, encapsulating the prevailing spirit of our era by symbolizing the escalating significance of digital technology and its transformative potential in shaping our lives.

The emergence of the metaverse in education is generating excitement as it promises to transform traditional classroom-based learning (Patil, 2022). Advocates of the metaverse envision a future where education is revolutionized through immersive and interactive learning experiences that surpass the limitations of traditional classrooms. However, it is crucial to acknowledge that the metaverse is still in its early stages of development, and numerous challenges must be addressed before its integration into formal education systems can become a reality. In context to India, **accessibility, equity, and quality control** are among the key challenges that need to be overcome. Ensuring that the metaverse is accessible to all students, regardless of their socioeconomic background or physical abilities, is vital for equitable educational opportunities. Maintaining quality standards and effective monitoring mechanisms is also essential to guarantee that the educational experiences offered in the

metaverse meet rigorous standards. Speculation arises regarding the potential occurrence of cognitive dissonance, which warrants consideration despite being speculative in nature. The incorporation of virtual reality and augmented reality technologies in education has the potential to introduce conflicting information or experiences that may challenge students' preexisting beliefs or understanding of the world. While the manifestation of this concern is yet to be observed, it is imperative to acknowledge its potential impact and devise proactive strategies to address it.

As technological advancements shape communities, virtual interconnectivity increases while physical proximity diminishes. Initially advantageous, this interconnectivity progressively has become more disadvantageous over time. In the context of a growing population, understanding a decline in physical proximity and socio-cultural relationships becomes crucial. Also, navigating the coexistence in two distinct realities—one physical and one digital, may poses significant challenges to mental well-being giving rise to cognitive conflicts, as previously speculated, leading individuals to feel disoriented and uncertain about their identity and surroundings. The presence of competing narratives, social constructs, and cultural norms further exacerbates this issue, making it challenging for individuals to discern between genuine reality and simulated experiences.

Cognitive psychologist Bartoshuk (1991) posits that "*the perception of reality is subjective, underscoring the individual's role in shaping their own reality.*" This subjectivity also extends to the perceived authenticity of the metaverse in accurately representing reality and providing meaningful experiences for all. In the landscape of evolving education, each moment presents individuals with new challenges and opportunities to envision and navigate their path in an ever-changing future. However, the proliferation of multiple 'real-ities' can introduce additional complexities and obstacles.

The blooming word and the kid-next-block, metaverse, which bases its origin in oxymoronic identity has generated considerable interest and discussion worldwide. Its potential implications and integration into individual lives now rest upon personal choice. This paper delves into the psychological, emotional, mental, and physical challenges posed by the metaverse, particularly in the context of education in India. Looking through the lens of changing dynamics and societal roles of human beings, it raises the inquiry of what it will mean to be human in a future where the metaverse is a pervasive presence. Recent developments such as layoffs, economic recession, and the increasing dominance of machines over human emotions and cognition have given way to apprehension, self-doubt, anxiety and poor health. This is particularly evident among individuals with limited technical awareness and skills, who are struggling to adapt in the cramping world of 'AI' and 'meta'. Regarding the educational sphere it becomes crucial to assess whether edaverse can effectively uphold the principles of quality and equity across different social classes and sectors. Given the current disparities in digital access and systemic inequities in India, a comprehensive examination of the feasibility of providing fair and inclusive educational opportunities is imperative. The educational landscape in India is characterized by intricate complexities, influenced by economic, caste, and class-based factors. Despite a reduction in caste and class-based divides over recent decades, the persistent economic divide continues to contribute to inequities and inequalities

in education. However, the scope of this paper does not delve into the full extent of this transformation. Yet, investigating the feasibility of establishing equitable educational access in the context of India remains a critical and essential subject for exploration for academics. In the current context, several questions arise. How will education serve as a catalyst in uniting diverse realms? Will the metaverse contribute to reducing divides, or could it potentially exacerbate them? How can the ediverse effectively address and diminish inequities? What guidance is essential for the current generation in shaping their educational and professional paths? To what extent can integrating emerging technologies into our academic framework nurture conscientious individuals? What strategies are available to differentiate between primary reality and augmented, virtual, and mixed realities?

## 1.2 Mixing real and realities

Mixing the real and virtual worlds without discernment is like trying to merge the light and shadow. While both have their own unique qualities and play important roles, they exist in separate realms and attempting to combine them can result in a distorted and confusing perception of reality. Plato's Cave Allegory is a powerful metaphor for understanding the nature of reality and the limitations of human perception (Zhang, 2021). In the allegory, prisoners are chained in a cave and can only see shadows of objects projected on a wall in front of them. They mistake these shadows for reality because they have never experienced anything else. Just as the prisoners in the cave only saw the shadows and were unaware of the reality outside, people who spend most of their time in the virtual world may also have a limited perception of reality. They might become deeply engrossed in the virtual realm to the point of disregarding the physical world and its intricacies, resulting in psychological turmoil. Moreover, just as the prisoners in the cave were manipulated by those projecting the shadows, individuals in Metaverse may also be manipulated by the technology and the people who control it. Considering the cognitive dissonance individuals may experience and the pursuit of accurate information, navigating between the virtual and real worlds may expose one to distorted or biased information (Baidoo-Anu & Owusu Ansah, 2023). Moreover, their awareness and acceptance of the genuine nature of the world beyond the virtual environment might be restricted or inconsistent, posing a potential risk in educational scenarios. Plato's Cave Allegory can serve as a cautionary tale. While many researchers have applied this analogy in various contexts, including modern education, I have employed it to effectively elucidate the paradoxical concept of 'Virtual Reality'. It reminds us to stay aware of the limitations of our perception and to question the information we receive, to ensure that we don't become prisoners of a virtual reality that limits our understanding of the world. Recent developments in technology have brought forth the concept of the metaverse, a virtual reality that aims to merge the physical and digital worlds. However, in academia, it is important to question the potential negative consequences of this new technology.

The Digital India Campaign is driving the nationwide transformation towards a digitally empowered society and knowledge economy. Education assumes a crucial role in this transformation, with technology playing a significant part in enhancing educational processes and outcomes. The relationship between technology and edu-

cation is mutually influential, with advancements in one reinforcing the other across all levels. The integration of metaverse technology into the Indian education system is inevitable, however, it definitely warrants a thorough examination of the country's diverse economic, gender, and infrastructure-based disparities. While recognizing the potential benefits it could offer if effectively communicated to audiences, the effectiveness of such technology in crafting an immersive and meaningful experience for students remains uncertain. This uncertainty stems from the subjective nature of reality perception and the impact of diverse sociocultural factors. In order to foster the effective utilization of technology to enhance learning, assessment, planning, administration, and other aspects of education at both the school and higher education levels, the establishment of the National Educational Technology Forum (NETF) as an autonomous body is proposed in NEP 2020. The NETF will serve as a platform for the exchange of ideas, facilitating informed decision-making regarding the integration, implementation, and utilization of technology. It will provide educational institutions, government bodies, and stakeholders with up-to-date knowledge, research insights, and opportunities for consultation and the sharing of best practices. To ensure its continued relevance in the dynamic field of educational technology, the NETF will actively collect authentic data from various sources, including educational technology innovators and practitioners. Additionally, it will engage with a diverse range of researchers to analyze the collected data and derive meaningful insights. By maintaining a steady influx of reliable information and fostering collaborations with experts, the NETF seeks to contribute to the ongoing advancement and effective application of educational technology in the educational landscape. An ongoing responsibility of the NETF will involve classifying emerging technologies according to their potential and projected timeline for disruption (NEP, 2020). The feasibility of incorporating metaverse technology into the Indian education system must be critically evaluated by NEFT, taking into account the unique challenges and realities of the Indian context. In considering the integration of new technologies into education, it is crucial not to lose sight of the fundamental goals, policies and underlying philosophies of education. Then how can we align disruptive technologies with the goal of empowering society and the transformative educational vision outlined in the National Education Policy of 2020? Indian Education philosophies have been continuously re-evaluated and refined to align with changing societal needs, objectives, and educational agendas. Any innovation, including the incorporation of metaverse technology, must be assessed in the larger ecosystem of education and the overarching principles, to ensure that it serves to enhance and augment, rather than disrupt or undermine, the broader goals of Higher Educational Institutes (HEI's). According to research, higher education institutions frequently adopt a combination of educational philosophies such as pragmatism, constructivism, and humanism, with the central aim of fostering critical thinking and empowering learners to comprehend, apply and transfer their learning to practical contexts. The aim is to equip students with the knowledge and skills required for their particular field, while also prioritizing their emotional and societal development (Cohen & Brawer, 2014). Pragmatism, constructivism, and humanism are educational philosophies that emphasize the practical application of knowledge, hands-on learning, and the development of the whole person, respectively (Gutek, 2014). These philosophies aim to produce well-rounded

individuals who possess not only knowledge and skills but also empathy, social responsibility, and a commitment to making a positive impact on society (Maslow, 1970; Noddings, 2013). As technology continues to advance, educators must equip students with the skills to navigate the digital landscape responsibly (Gikas & Grant, 2013). While technology offers new opportunities, it is crucial to consider its potential negative consequences (Turkle, 2011). As such, educators and students must work together to ensure that technology is consumed wisely and in a manner that promotes personal and societal well-being along with a measure of consideration of reality (NEP, 2020). In light of the emergence of the metaverse and its potential impact on education, it is crucial for quality higher education to cultivate individuals who possess not only knowledge and skills but also qualities like empathy, adaptability, and creativity for success in a changing world. However, the metaverse also brings potential pitfalls, such as creating exclusive and inaccessible learning environments that perpetuate inequalities. Therefore, educators must integrate the use of the metaverse into a holistic approach to education that promotes personal growth, ethical values, and social responsibility.

### 1.3 Higher education in India

The growth of the higher education system in India has a rich historical trajectory. Its origins can be traced back to ancient times when gurukuls and ashrams served as centers of learning. These establishments primarily focused on imparting knowledge of religious texts. During the medieval era, under the rule of Mughal Empire, Islamic centers of learning, such as Madrasas, dominated higher education in India, providing education in Islamic theology, law, and philosophy. The modern higher education system in India began taking shape during the colonial period with the establishment of universities like the University of Calcutta in 1857, followed by the universities of Bombay and Madras in 1858. Initially, these universities catered mainly to the colonial elite and were inaccessible to the broader population. However, after gaining independence in 1947, the Indian government prioritized expanding access to higher education. Numerous initiatives were launched, including the establishment of new universities, colleges, and institutions of higher learning. Policies were also introduced to promote inclusivity, enabling women, minorities, and disadvantaged groups to access higher education. Today, India boasts one of the world's largest higher education systems, comprising over 900 universities and 40,000 colleges. However, significant challenges persist, including issues related to accessibility, quality, equity and funding. Addressing these challenges remains crucial for the continued development and enhancement of the higher education system in India (Hossain & Mondal, 2019). Till date Indian education system has been heavily colonialized and being a polyglot country it does have the globally accepted language, English, as its first and preferred language in higher education. Although, the ability to read and write in English varies significantly across different regions and socioeconomic groups in India. With the majority of population in India, English is not used as the quotidian language, and proficiency in the same is often correlated with higher levels of education and urbanization. Therefore, the percentage of people who know how to read and write in English is likely to be higher among urban, educated, and affluent popula-

tions, and lower among rural and less educated populations. Higher education sector still has a significant proportion of students with proficiency in English. The National Education Policy 2020 highlights the significance of bilingualism and multilingualism in both school and higher education. It emphasizes the importance of prioritizing linguistic diversity and inclusivity in order to create an equitable and effective educational system that benefits learners from all language groups and backgrounds. A facet truly intriguing to mull over in the contemplation of the metaverse landscape.

#### **1.4 Metaverse integration challenges in Indian higher education**

The implementation of metaverse education in India poses a significant challenge as India is a linguistically diverse country, and preserving its linguistic and cultural diversity is crucial. Therefore, metaverse education must ensure that it accommodates and respects the linguistic diversity. According to the latest census reports, being the most populated country in the world, India still has a literacy rate of 74.04% only. With an aim to make education accessible to all, the government is taking definitive measures, and in this given context, technology can serve as a useful tool for learners and facilitators, providing personalized and collaborative learning opportunities in preferred languages. However, there still remains a battle of resources livelihood, poverty, equity and equality along with other basic needs of life.

Amidst the COVID-19 pandemic, higher education encountered a myriad of challenges, disrupting the educational system with issues like unreliable internet connectivity, postponed exams, diminished motivation, and emotional and mental disturbances. This signals a warning to be vigilant about potential concerns that may surface when assessing the efficacy of a system or tool, such as the metaverse in education. It becomes essential to meticulously scrutinize its potential to undermine fundamental aspects of life, particularly health and well-being, which significantly impact the holistic development of individuals and society at large.

## **2 Gen Z's perspective on metaverse**

### **2.1 Methodology**

The genesis of this research paper traces back to a classroom discussion comparing the merits and drawbacks of online versus offline teaching methods. Employing Merriam and Grenier's (2018) conceptual framework, a purposive sample of eighteen third-year students ( $N=18$ , M-7, F-11), predominantly from design and computer science backgrounds, participated in qualitative interviews. The interviews<sup>1</sup> were transcribed instead of being recorded to ensure the participants' responses were captured authentically without the awareness of being observed. The selected students, well-versed in the metaverse and virtual reality technologies, such as the Oculus Quest 2 and other virtual reality headsets, offered diverse perspectives due to their

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<sup>1</sup> Questionnaire attached as Annexure 1.

experiences with online education, during the COVID-19 disruptions, and familiarity with technological tools.

## **2.2 Analysis**

The analysis of interviews with Generation Z students, pivotal stakeholders in the metaverse/ediverse, revealed surprising insights. Divided into three key themes, their responses shed light on crucial aspects of their perspectives and concerns.

### **2.2.1 Student concerns and perspectives on metaverse inclusivity**

The qualitative pilot study uncovered diverse responses from students regarding the concept of a virtual parallel reality. Despite their digital literacy, students displayed a mix of excitement and apprehension. Their concerns spanned technology integration in the curriculum, emphasizing relevance, currency, and quality. Additionally, students expressed worries about potential drawbacks associated with metaverse inclusivity, showing heightened awareness of socio-economic challenges in India. The socio-economic aspect prompted considerations related to addressing the basic aspects of equality and equity concerns in education.

### **2.2.2 Student concerns about mental and emotional well-being in the metaverse**

Privacy issues, mental health strains, and the negative consequences of prolonged exposure to the metaverse emerged as significant apprehensions among students. Despite acknowledging the allure of tech interventions, the tech-savvy Generation Z cohort stressed the importance of educational institutions actively participating in responsible technology integration, to avoid misuse, overuse or disuse of the same. Students voiced concerns about mental and emotional well-being, arising from privacy violations, abuse, bullying, and disconnection from the real world. Furthermore, the issues of confusion, cognitive dissonance, physical isolation, addiction, dependency, and various health ailments resulting from prolonged exposure to simulation are still undergoing efforts to find appropriate solutions.

### **2.2.3 Broader metaverse issues and ethical challenges**

Delving deeper into student apprehensions, the research intricately examined broader metaverse concerns, specifically tackling the heightened susceptibility to cyber threats and identity theft. The capacity to fabricate and tailor digital identities within the metaverse, embodied by avatars, introduced complexities in distinguishing between the tangible and virtual realms. In the metaverse landscape, users possess the capability to craft and personalize their digital personas through avatars, mirroring their real-world persona and ego. The integration of cutting-edge real-time tracking technologies empowers users to exercise control and manipulation over their avatars, fostering a sense of ownership, interactivity, embodiment, and social engagement within the virtual domain (Chen, 2022). Occasionally, this detaches individuals from live social engagements, giving rise to social unease and various psychological chal-



allenges. In conventional educational settings, whether physical classrooms or online platforms, students typically engage using their authentic identities. However, the metaverse offers them the opportunity to present themselves through avatars that are customized, realistic, and dynamic, potentially diverging from their real-world counterparts. This fusion of authentic and virtual identities introduces complexities and challenges in discerning between the two realms (Kye et al., 2021; Xi et al., 2022). Researchers underscored the likelihood of emotional and social obstacles arising when students heavily rely on virtual world social connections, leading to difficulties in forming meaningful relationships in the tangible world. The advent of virtual identity has ushered in a novel array of ethical predicaments, encompassing conflicting ideologies, simulated experiments, data breaches, racial and religious tensions, as well as instances of bullying and violence (Dionisio et al., 2013; Park & Kim, 2022). These ethical quandaries, spanning international, racial, religious, and gender dimensions, emphasize the imperative for prudence and the inclusion of ethics education to navigate the intricate landscape of the evolving educational metaverse.

### **3 Preparing for the future**

Based on the profound insights gained from the analysis of interviews with Generation Z students, who play a pivotal role in the metaverse/ediverse, it is crucial to formulate a strategic course of action that addresses their perspectives and concerns.

#### **3.1 Curriculum design and relevance**

To address the diverse concerns voiced by students regarding metaverse inclusivity, educational institutions need to adopt a multi-faceted approach. Educational institutions should actively reassess and update their curriculum to integrate technology thoughtfully. This involves ensuring that the inclusion of metaverse concepts is not just a technological trend but aligns with the relevance, currency, and quality of educational content. The socio-economic challenges highlighted by students underscore the necessity to design inclusive curricula that address equality and equity concerns.

#### **3.2 Mental and emotional well-being support**

Given the students' apprehensions about mental and emotional well-being, educational institutions must prioritize the mental and emotional well-being of students engaging with the metaverse. A comprehensive well-being program should be implemented, encompassing awareness campaigns, counseling services, and support networks. Responsible technology integration should be a key focus, with institutions actively participating in shaping a positive tech environment. Clear policies and regulations addressing privacy concerns, abuse, and addiction should be developed, and students should be educated about their rights and responsibilities in the digital space. Although, many higher educational institutes look into offline support mechanisms, there is a gap in appropriate counseling for online concerns.

### 3.3 Responsible technology integration

To mitigate the risks associated with metaverse inclusion, educational institutions should take an active role in promoting responsible technology integration. This involves establishing clear policies and regulations governing the use of metaverse tools and ensuring that educators are adequately trained to guide students in navigating these virtual environments. Additionally, measures to prevent misuse and safeguard students' online experiences must be implemented. Programs focusing on digital literacy, responsible technology usage, and psychological well-being can be integrated into the educational framework.

### 3.4 Ethical education and awareness

Given the ethical challenges associated with the metaverse, there is a pressing need for integrating ethics education into the curriculum. Students should be educated on the potential conflicts arising from virtual identities, simulated experiments, data theft, racial and religious tensions, bullying, and violence. This will empower them to navigate the metaverse responsibly and ethically.

### 3.5 Collaboration and dialogue

In addressing these multifaceted concerns, a collaborative approach involving educational institutions, policymakers, technology developers, and students themselves is paramount. Regular dialogues, workshops, and forums should be facilitated to ensure continuous feedback, understanding, and adaptation to the evolving landscape of the educational metaverse.

In the technological domain, instances of failures and limitations often garner attention, prompting apprehensions regarding potential risks linked to the internet. Therefore, the strategic implementation of the ediverse should be characterized by a proactive, holistic, and collaborative approach. This entails not only aligning educational practices with technological advancements but also prioritizing the well-being of students and fostering a culture that is both responsible and ethical in the digital realm. Such an approach ensures that the educational metaverse serves as a transformative force, enhancing positive learning experiences while mitigating potential risks and challenges. Anuj Bhatia, in the Indian Express in December 2022, underscored the imperative of preparedness concerning the metaverse. Reflection upon data of this nature, by researchers and technology experts, holds significance for further technological implementation in education. It is crucial to note that this paper does not negate the importance of integrating technology into our lives, including the metaverse, but rather delves into the potential consequences and dangers associated with its adoption, without due considerations, particularly within India's educational system. The emphasis lies in comprehending the limitations of consumption and ensuring the preparedness of content and safety measures taken to navigate the metaverse. In the words of Satya Nadella, the CEO of Microsoft, the objective is not a competition between man and machine but a collaboration between the two. Technology is intended to serve humanity and enhance human connections rather than

replace them. In this context, it becomes essential to contemplate how we can ensure that the ediverse adopts an interconnected approach to problem-solving, without inadvertently creating new challenges along the way. To achieve this, a balanced approach prioritizing human values, ethics, and well-being must be central to the development and implementation of metaverse technologies.

The future of education is anticipated to involve a convergence of traditional classroom-based learning and innovative digital technologies. To fully harness the benefits of disruptive technologies in education, bridging the digital divide is imperative. Initiatives like the Digital India campaign and the availability of affordable computing devices play a pivotal role in eliminating disparities. As disruptive technologies render certain jobs obsolete, adopting efficient and quality-oriented approaches to skill development and deskilling becomes crucial to ensure the creation and sustenance of employment opportunities. Teachers, particularly, require suitable training and development to adeptly navigate these evolving teaching environments. In this “meta” era, educators shoulder an elevated responsibility to nurture mindful and holistic learners capable of thriving in this ever-changing landscape. In 2021, Meta announced an initiative worth \$150 million USD aimed at training the next generation of creators to develop immersive educational content (Zuckerberg & Meta 2021). It is hoped that this investment will foster a more holistic approach to upskilling within the educational universe.

## 4 Conclusion

India’s heterogeneous landscape encompasses multifaceted aspects, including linguistic variations, cultural disparities, unequal educational opportunities, resource discrepancies, and diverse socio-economic conditions. This diversity poses a considerable challenge in ensuring uniform educational quality, sparking debates regarding the role of technology in addressing this divide. While technology holds promise in certain contexts, it is also accompanied by perceived limitations. The incorporation of educational software and hardware will not only influence the curriculum but also fundamentally transform the learning experience. Therefore, comprehensive research is imperative to delve into the intricacies of technology and education, encompassing these domains and transcending their boundaries.

The study in this paper is subject to constraints stemming from the extensive diversity of the population in India. The dataset used in this study is exclusively obtained from a specific private university, where the majority of students came from socio-economic backgrounds ranging from upper-middle to lower-middle class. Due to their educational background and familiarity with digital technologies, these students can be considered as digital natives. However, it is important to note that the findings and conclusions drawn from this study may not be generalizable to a wider population due to the specific characteristics and composition of the chosen student set and the intricate nature of educational inequities within the Indian context. Also, the rapidly evolving nature of technology and the metaverse means that certain concerns and challenges may change over time, underscoring the need for ongoing research to capture evolving dynamics accurately. Technology is proposed as a possible solution,

but its implementation must be carefully evaluated for both its advantages and disadvantages, as also highlighted by the most important stakeholders. Despite the study's limitations, it offers valuable insights into the factors influencing the effectiveness of technology in enhancing education quality, which can guide future research and inform policymaking efforts in this domain.

In context to AI, data serves as a crucial fuel for these technologies, highlighting the importance of raising awareness regarding privacy, data protection laws, and standards. Ethical considerations surrounding the development and deployment of AI-based technologies also warrant attention. In light of the dynamic nature of the metaverse, a deliberate and thoughtful approach is necessary when formulating content strategies for the platform. It is imperative to integrate ethical frameworks rooted in moral, legal, social, economic, and empathetic considerations. **Implementing policies that safeguard privacy, enhance cybersecurity, ensure content moderation, promote inclusivity and accessibility, empower users with consent, prioritize digital well-being, and facilitate responsible collaboration among stakeholders are key areas of focus. In the Indian context, it is vital to prioritize accessibility, diversity, and inclusivity while addressing issues of exclusion, inclusion, and opportunities.** This approach will pave the way for an equitable and efficient educational ecosystem that benefits all individuals involved. Education plays a pivotal role by promoting awareness and understanding. Pilot studies, carefully designed and scaled, are essential to explore the benefits of online and digital education while mitigating potential drawbacks (NEP, 2020). It is crucial to recognize that while the metaverse presents novel learning prospects, it cannot defenestrate the intrinsic value of human interaction and socialization in the educational domain. Formal education systems not only impart knowledge but also foster socialization and emotional growth, which are indispensable for the comprehensive development of individuals. While the metaverse holds promise for educational advancements, it is unlikely to entirely supplant traditional educational structures.

## Annexure 1

1. How do you find the online classes?
2. Why do you think the attendance is more in face to face classrooms in comparison to Online Classes?
3. What was your experience like when transitioning from a traditional classroom setting to a digital learning environment?
4. Have you heard of Metaverse?
5. Have you ever played Roblox? If so, do you believe that playing Roblox provides a foundation for you to comprehend the concept of the metaverse?
6. Have you heard of education in Metaverse/ Eduverse? What were your initial thoughts and reactions when considering the inclusion of the metaverse in higher education in India?
7. As a student in higher education, how did you perceive the idea of a virtual parallel reality and its potential impact on your learning experience?

8. In the context of higher education in India, what concerns or considerations do you have regarding the integration of technology, specifically the metaverse, into the curriculum?
9. What are your expectations form faculty in eduverse?
10. From your perspective, what are the potential advantages or benefits of incorporating the metaverse into higher education in India?
11. Conversely, what are the potential drawbacks or challenges that you anticipate with the inclusion of the metaverse in the higher education system?
12. How do you believe the integration of the metaverse can contribute to inclusivity in higher education in India?
13. How do you envision the potential impact of the metaverse on traditional classroom dynamics and interactions within the higher education context in India?
14. In your opinion, what steps can the higher education system in India take to effectively navigate the opportunities and challenges associated with the inclusion of the metaverse?
15. Accessibility, Equality, and availability of gadgets and other resources required for participation in a metaverse classroom in the higher education system of India, your thoughts on the same.
16. Any other insights, anecdotes, experiences, researches you want to share?

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**Data Availability** *Annexure 1- Questionnaire*; Analyzed dataset is *shared within the manuscript*.

## Declarations

**Conflict of interest** None.

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