

Academic Augmentation: Analyzing Avatar Design in Educational Metaverse

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Abstract—The emergence of Metaverse from the realms of science fiction into a tangible reality marks a transformative epoch in the digital landscape. Avatars, serving as digital embodiments of users, wield significant influence over educational interactions within this burgeoning virtual realm. This qualitative study embarks on an exploration of how avatar design shapes the landscape of virtual education within the nascent Metaverse. Structured interviews were conducted with a diverse cohort of 20 participants, comprising equal representation of 10 males and 10 females from varied educational backgrounds. Through these interviews, the research utilized qualitative analysis methods (namely as thematic coding) and delved into the nuanced perspectives of participants regarding the impact of avatar design on their learning experiences. Findings unveil the multifaceted role of avatars in online interactions, with attributes such as gender, facial features, and attire emerging as pivotal design elements. Participants' individual personalities and external influences wielded significant sway over their avatar choices, while varying emotional connections translated into preferences for either professional demeanor or self-expression within the virtual educational landscape. Amidst mixed opinions surrounding the educational efficacy of avatar design, some participants foresee heightened engagement, while others express skepticism. Despite acknowledging the socialization benefits, lingering uncertainties persist regarding the Metaverse's efficacy as an educational tool. Preferences regarding avatar promotion and customization exhibit variance, with prevalent concerns revolving around privacy and data security. Furthermore, the comprehensive data analysis of participants' demographics revealed a diverse cohort, encompassing individuals from various countries, academic disciplines, and scholastic years. This multifaceted approach facilitated a comprehensive exploration of avatar preferences and user experiences, enriching the study's findings and enhancing its applicability across diverse educational contexts.

Keywords— Metaverse; avatar; virtual education; digital persona; avatar customization

I. INTRODUCTION

The concept of Metaverse, originally conceived by Neal Stephenson in his novel 'Snow Crash' and later realized in platforms like Second Life, has transformed into a dynamic and socially driven platform with a focus on virtual reality (VR) (Cheong, 2022). This evolution has led to a space that not only facilitates the exchange of interests but also fosters social immersion (Park & Kim, 2022). Particularly in educational contexts, the integration of Metaverse technology has garnered significant attention, introducing innovative methods for student engagement and enhancing the overall learning experience (Nowak & Fox, 2018).

In contrast to traditional e-learning tools, Metaverse offers a unique advantage through its ability to impart a tangible sense of realism in virtual learning environments, thereby addressing a notable limitation in conventional e-learning (Kanematsu et al., 2014). As Metaverse technology continues to advance, it holds the promise of transforming social interactions, backend systems, and educational opportunities within the digital realm.

Central to Metaverse experience are avatars, virtual representations that empower users to participate and interact within virtual environments and platforms (Blascovich et al., 2002). Avatars play a pivotal role in enhancing students' social presence and engagement in virtual learning environments, mitigating feelings of isolation and fostering a sense of community and collaboration (Bailenson & Yee, 2008; Bower, Lee, & Dalgarno, 2020). Despite potential technological challenges, avatars contribute to creating a more inclusive learning environment, accommodating various learning styles and enhancing the accessibility of educational content.

Immersive technologies, such as VR simulations, have been shown to significantly enhance knowledge retention and skill acquisition, particularly in fields like medical education (Kizilcec et al., 2017). Furthermore, the configuration of avatars has the potential to influence engagement, academic achievements, and self-efficacy among learners (Braguez et al., 2023). The creation of immersive learning environments, complete with multisensory experiences, is deemed effective in accommodating various learning styles and preferences, ensuring satisfaction with the diverse requirements of learners (Dalgarno & Lee, 2010).

This research delves into the impact of avatar design on instructional interactivity in virtual environments, aiming to provide valuable insights for enhancing the educational experience through avatar technology and fostering discussions among higher education stakeholders. Despite the growing interest in virtual education and the Metaverse, there remains a gap in comprehensive research on customized avatar design for educational settings. This study seeks to address this gap by investigating how thoughtfully designed avatars can positively influence student motivation, engagement, and knowledge retention.

The findings of this study hold practical implications for the design and implementation of avatars in Metaverse settings, particularly within educational contexts. By understanding demographic characteristics and users' familiarity with emerging technologies, companies can tailor



marketing strategies and user training processes to enhance user experience and satisfaction. Ultimately, this research aims to contribute to the ongoing development of avatar technology in education, promoting more effective and inclusive virtual learning environments.

II. LITERATURE REVIEW

The literature review explores the evolution and impact of Metaverse, particularly focusing on its transformative role in education through the utilization of avatars. This section is organized to highlight key themes and discussions surrounding the intersection of Metaverse technology and educational practices.

A. From 19th Century to Metaverse: Revolutionizing Education

In the 19th century, distance education began its journey, initially manifesting through mediums like correspondence courses. Over time, it evolved with advancements in technology, embracing radio, television, and eventually, the internet. However, the most recent evolution in educational delivery comes with the emergence of the Metaverse, ushering in a profound shift in educational paradigms. This digital realm offers immersive and boundless educational experiences, where learners can engage and interact through digital avatars (Braguez et al., 2023).

B. Metaverse Revamp: VR to Socially Immersive Education

The evolution of Metaverse from its origins in virtual reality (VR) to a platform emphasizing social interaction represents a profound transformation with far-reaching implications for education. Initially conceived as a space primarily focused on providing immersive experiences through VR technology, Metaverse has progressively shifted its emphasis towards fostering social connections and collaborative learning experiences.

This transition resonates deeply with the broader movement in educational reform, driven by the relentless march of technological advancements. Scholars such as Muhammad et al. (2021) and Park & Kim (2022) have highlighted this evolution, recognizing its alignment with the changing educational landscape. As the Metaverse embraces a socially immersive setting, it underscores its adaptability and growing relevance within contemporary educational frameworks.

This shift in focus holds immense promise for educators and learners alike, opening new avenues for interactive and engaging educational experiences. By prioritizing social interaction, Metaverse offers opportunities for collaborative problem-solving, peer-to-peer learning, and community building that transcend the limitations of traditional classroom settings. As educators continue to explore the potential of the socially immersive Metaverse, it is poised to play an increasingly integral role in shaping the future of education.

C. Navigating Metaverse: Security Challenges

The rapid expansion of immersive technologies brings to light significant concerns regarding the security and privacy of Metaverse. As these technologies become more

interconnected, they create a sprawling attack surface ripe for exploitation. Within Metaverse, accessories like cameras and sensors collect vast amounts of personal data, placing users at risk of privacy breaches and unauthorized access.

This proliferation of personal data raises concerns about profiling and targeted advertising, with potentially harmful implications across sensitive sectors such as military and healthcare. Scholars such as Qamar, Anwar, & Afzal (2023) have shed light on these challenges, highlighting the urgent need for robust security measures to safeguard user privacy and mitigate the risks associated with the expanding Metaverse ecosystem.

D. Metaverse and Well-being

While Metaverse presents considerable advantages, there are ongoing apprehensions regarding its influence on both physical and psychological well-being. The immersive nature of the environment may contribute to physiological challenges, such as headaches and nausea, as well as psychological ramifications, including addiction and social isolation, as observed by Matsuda (2020).

Additionally, virtual interactions carry the potential risk of inducing psychoses, leading to consequences such as delusions and hallucinations. Utilizing precautionary measures can optimize Metaverse, ensuring the maximization of its advantages while minimizing potential adverse effects.

F. Metaverse Avatars: Persuasive Interactions and Engagement

The term avatar derived from the Hindu concept 'avatāra,' has become a pivotal element within Metaverse, influencing user interactions (Blascovich & Bailenson, 2011; Castronova, 2005; Nowak, 2015). Blascovich, et al. (2002) emphasize avatars as digital representations that facilitate user engagement and self-expression in Metaverse (Ibrahim, 2021; Yee & Bailenson, 2007).

Visually appealing avatars play a crucial role in enhancing social impact and fostering connections during virtual interactions, ultimately contributing to increased engagement levels (Lee & Nass, 2003; Yee & Bailenson, 2007). The visual personality of avatars is highly significant, as visually appealing representations actively contribute to bolstering social influence and forming connections in virtual interactions.

G. Metaverse Avatars: Influencing Learning

Within the educational Metaverse, individuals create avatars to serve as virtual representations, influencing both learner engagement and academic results (Braguez et al., 2023). The features of avatars differ among platforms, with video games providing interactive elements, while social networking sites may have more restricted features. The connection between personal success and individual capabilities is emphasized, with outcomes being influenced by various attributes.

Studies conducted by Bailenson and Yee (2008) as well as Bower, Lee, and Dalgarno (2020) highlight the constructive effects of avatars on student engagement and social presence

in virtual learning environments. Classes in Metaverse go beyond conventional settings, promoting collaboration and interactive learning experiences. Customizable avatars in Metaverse encourage engagement and aid in visualizing abstract concepts, holding the potential to enhance the overall quality of virtual education.

H. Avatars: Digital Mirrors of Self-Expression

Belk (2013) suggests that the creation and interaction with avatars result in a distinct connection between users and their graphical representations. This connection is characterized by users perceiving their avatars as extensions of themselves. Through the customization and control of avatars, individuals can mold and present their identities, values, and aspirations in digital spaces. The avatar serves as a symbolic representation of their identity within the virtual environment.

The literature on avatar customization focuses on the selection and modification of physical attributes, including gender, skin tone, hairstyle (Ducheneaut et al., 2009), height, and facial features (Hooi & Cho, 2012). These factors contribute to the overall appearance of avatars, encompassing details like clothing design, shirts, and shoes (Ducheneaut et al., 2009).

I. Avatar: Privacy Concerns

The integration of avatars within social computing platforms brings forth pressing privacy concerns, a matter underscored by Zahedi et al. (2022). With a growing awareness of the vulnerability of personal data, particularly amidst the backdrop of escalating data breaches by major entities, users are increasingly cautious and hesitant to entrust their information to online environments.

Addressing these concerns necessitates a delicate balance between personalization and protection within social computing systems. Designing avatar systems with a keen focus on privacy awareness is imperative, ensuring that user data is handled responsibly and ethically. By implementing robust privacy measures and transparency in data practices, platforms can foster a sense of trust and confidence among users, thereby safeguarding their privacy while still delivering personalized services tailored to individual preferences.

J. Educational Avatars

In educational settings, avatars suggested to replicate the physical features of individuals to foster trust (Pakanen et al., 2020) encounter difficulties when used in AR applications due to occlusion issues related to specific contexts. It is vital to have easily recognizable avatars for building trust and ensuring accurate identification of the person being portrayed. Considering visual aesthetic aspects is crucial in education, and recent studies highlight the importance of incorporating full-body motion tracking and designs to improve immersion while minimizing any potential discomfort (Pakanen, Alaves, van Berkel, Koskela, & Ojala, 2022).

Research on avatars underscores the significance of elements such as color, size, and visualization styles, emphasizing the need for thorough evaluation to ensure fairness (Pakanen et al., 2022). Acknowledging these various

factors underscores the intricate nature of designing avatars to facilitate fair assessments across diverse contexts.

K. Avatars in Education: Advantages

Within educational environments, the integration of avatars offers a plethora of benefits that significantly enhance the learning experience. Avatars facilitate real-time communication, enabling activities such as collaborative resource gathering, updating mind maps, and engaging in discussions about ethical decision-making among students (Hu et al., 2023). Moreover, carefully designed learning missions incorporating game-like features not only improve learning outcomes but also help in maintaining students' focus (Platz, 2022).

Overall, educational avatars create interactive and immersive learning encounters that promote student engagement, motivation, and individual development. By providing dynamic tools for communication and collaboration, avatars contribute to fostering a conducive learning environment where students are actively involved in their educational journey.

L. Metaverse and Avatars in Education: Evolution, Impact, and Theories

In conclusion, the literature traces the evolution from 19th-century distance education to the present dominance of Metaverse, highlighting its transformative role in education through avatars. Metaverse's shift from virtual reality to a socially immersive platform aligns with broader educational reforms driven by technological advancements. While it holds promise for immersive educational experiences, concerns arise regarding security, well-being, and privacy. Avatars, integral to Metaverse, enhance user interactions and learning outcomes, particularly in educational settings. The literature underscores the varied impact of Metaverse and avatars on education, covering technological advancements, security challenges, well-being considerations, and the positive role of avatars in interactive learning experiences.

Hence, the research questions are formulated based on the literature as follows:

- How do participants in educational settings view the impact of avatar design in Metaverse on their learning experiences?
- What deeper insights can be gained from participants regarding the significance of avatar design within Metaverse, particularly in an educational context?

III. METHOD

This study explores qualitative research by employing structured interviews using a snowball sampling technique. Snowball sampling is a participant selection method that relies on referrals from existing participants, particularly effective when dealing with hard-to-reach populations (Sadler et al., 2010). In a manner akin to the progressive augmentation of a snowball as it traverses from one individual to another, this procedure entails the initial participants providing referrals, this prompts the referred individuals to subsequently make

additional referrals, continuing the cycle. (Baltar & Brunet, 2012).

In the realm of qualitative data collection methodologies, such as interviews or observations, researchers routinely employ the principle of data saturation (Aldiabat & Le Navenec, 2018). This method entails the persistent acquisition of data until no novel information or insights surface, emblematic of having achieved a state of data saturation. This signifies a thorough exploration of the subject matter. It is imperative to elucidate that the selection of the sample size, specifically 20 participants in this instance, was dictated by the attainment of data saturation.

Nevertheless, the introduction of new participants through referrals introduces a limitation that may compromise the representativeness of the sample, presenting challenges in assessing the overall group's representativeness and potentially culminating in biased sampling (Sadler et al., 2010). Through qualitative research, the researchers aim to deepen participants' understanding of user-avatar interactions and their influence on the learning process. This section offers valuable insights into the nuanced aspects of avatar design evaluation, moving beyond quantitative metrics to capture the holistic user experience.

The structured interview encompasses a sample size of 20 participants exhibiting diverse characteristics, including variations in age, gender, academic year/status, and departmental affiliation. The inclusion of this heterogeneous group offers a comprehensive array of perspectives for the structured interview.

A. Avatar Design Analysis: Structured Interviews

The researchers conducted structured interviews with 20 participants, maintaining a balanced representation of both male and female subjects. The participants were sourced from a range of educational levels, spanning Ph.D., Master's, and undergraduate programs to acquire thoughtful perspectives on the utilization of avatars in educational platforms within the Metaverse, a research approach involves employing structured interviews. This method systematically gathers data and information from participants using a predetermined set of questions. Structured interviews consist of a predefined set of questions with uniform wording and instructions, as outlined by Kumar (2011). This practice is commonly implemented to ensure that the responses can be systematically aggregated to align with the specific objectives of the analysis, as stipulated by Nor Rashidi et al. (2014).

B. Study Instrument

The employment of questionnaire-based surveys provides researchers with a rapid means of gathering responses. Nevertheless, within the sphere of transformation, there exists an augmented potential for misinterpretations and challenges in discerning novel approaches. On the contrary, the execution of structured interviews necessitates more considerable time and effort, yet it provides several noteworthy advantages. It fosters in-depth conversations on the subject, diminishes the probability of misunderstanding questions, and provides analysts with a deeper comprehension of the subject matter, as

highlighted by Ünlü et al. (2024). As asserted by Kumar (2011), one of the advantages of employing structured interviews is that it ensures consistency in responses, thereby facilitating the comparison of data.

The interview schedule for this study underwent a meticulous development process that incorporated the valuable input of four PhD holding experts from various significant fields (educational technology, instructional design, artificial intelligence and curriculum design). These experts, well-versed in Metaverse technology, education, and qualitative research, played a significant role in shaping the questionnaire. Their association was instrumental in guaranteeing the interview questions align precisely with the research objectives, ensuring relevance to the study's goals. Besides, their expertise helped in refining the questions to be clear, concise, and void of any potential biases or ambiguities, in this way enhancing comprehensibility for the participants.

The final version of interview schedule consists of eighteen questions designed to investigate participants' views and opinions on avatar design within Metaverse for educational environments. The questions are structured in a coherent sequence to encourage the stream of the interview and accumulate comprehensive data.

Participants were assured that their personal data and responses would stay undisclosed, illustrious as it were by codes to ensure their assurance. The interviews were recorded with participants' consent.

The interview questions, starting with a presentation of the participant themselves. Researchers looked to accumulate fundamental demographic data, such as nation of beginning, age, academic background, and year of study. Hence, participants were guided through questions tending to their recognition with virtual universes, the concept of Metaverse, and their encounters with these computerized situations. Those who were not recognizable with Metaverse were given a brief depiction to inspire their beginning impressions.

The interview begins with an introduction and consent request, establishing the researchers' identity, purpose, and commitment to confidentiality. It also gives participants the choice to consent to the use of their interview records for the study and the recording of the interview, ensuring transparency and informed participation. The first set of questions aims to gauge participants' familiarity with virtual universes, Metaverse, and avatars, starting with common awareness questions and gradually delving into their experiences and recognitions. The subsequent questions dive into more viewpoints of avatar design, including the personal characteristics participants prioritize when designing their avatars. These questions are essential to reveal individual preferences and recognitions related to avatar customization.

Questions 6 to 9 investigate the relationship between personality and avatar design, as well as the participants' attachment to their avatars and potential changes they might consider in an educational Metaverse environment. The following set of questions 10 to 13 addresses the potential impact of avatars and Metaverse on students' educational experiences, social interaction, participation, and cognitive

aptitudes. These questions seek to investigate whether participants believe in the educational potential of Metaverse and how it may compare to conventional instructive models.

Questions 14 and 15 centers on the visual and creative perspectives of Metaverse and avatar design, addressing knowledge retention and the freedom to design avatars. These questions dive into the educational and ethical dimensions of avatar-based education. Question 16 inquiries about participants' hesitations regarding avatar utilization in educational settings. Finally, question 17 explores individual concerns or reservations regarding Metaverse, tending to potential worries about this emerging technology and its implications. The interview concludes with question 18, which invites participants to express their readiness or reluctance to participate in virtual instruction within Metaverse using their avatars today.

C. Manual Scrutiny Approach: Contextual Indulgent and Reliability

The interviews were recorded into voice files, transcribed and specifically coded as a section of analysis of this dissertation. Despite the accessibility of various programs outlined for this task, researchers chose not to utilize any of them. Whereas researchers recognize the preferences of utilizing such programs, the researchers' essential focus was on disclosing inferred implications that are unexpected upon the foundation events. Computer programs are expanding and exaggerating a potential threat facing any method seeking to analyze information through efficient chunking and coding, as noted by Denscombe (2010). Thus, researchers opted for a manual analysis to avoid any oversight of the interview's overall context, and the participation of two authors in this method bolstered the dependability of our analysis.

D. Participants

In accordance with the expert advice received, researchers conducted a study with a meticulously chosen sample size of 20 participants. This sample was mindfully composed to represent a diverse cross-section of individuals over various scholarly levels, including freshmen, sophomores, juniors, seniors, as well as candidates pursuing both Ph.D. and master's degrees. Within this sample, maintained a balanced gender distribution, comprising ten male and ten female participants. This gender balance was considered crucial to capture a well-rounded perspective on the subject matter. Participants from diverse countries were chosen to provide a diverse and global viewpoint on the research subject, as depicted in Table 1.

TABLE I. THE PARTICIPANTS OF STRUCTURED INTERVIEW

Participants	Age	Country	Gender	Year/Status	Department
1.	22	India	Male	Junior	AI and Big Data
2.	21	Indonesia	Female	Junior	AI and Big Data
3.	28	China	Female	PhD	Management studies
4.	28	Nepal	Male	Master	Management studies
5.	18	Russia	Male	Freshman	AI and Big Data
6.	22	India	Male	Sophomore	AI and Big Data
7.	22	Bangladesh	Female	Sophomore	AI and Big Data
8.	19	Uzbekistan	Male	Junior	AI and Big Data
9.	22	Russia	Male	Master	Management studies

Participants	Age	Country	Gender	Year/Status	Department
10.	28	Uzbekistan	Male	Master	Management studies
11.	19	India	Female	Sophomore	AI and Big Data
12.	20	India	Female	Sophomore	AI and Big Data
13.	18	Indonesia	Male	Sophomore	AI and Big Data
14.	23	S. Korea	Male	Sophomore	AI and Big Data
15.	20	India	Female	Sophomore	K-pop Arts Management
16.	21	Kyrgyzstan	Female	Junior	AI and Big Data
17.	26	Uzbekistan	Male	Sophomore	AI and Big Data
18.	23	France	Female	Master	Management studies
19.	30	Russia	Female	Master	Management studies
20.	24	Russia	Female	Master	Management studies

E. Exploring the Mosaic: Data Analysis of Participants

In question 1, researchers offered an overview of the demographic characteristics of the participants twenty interviewees who had readily engaged in the interview. These participants transparently shared information about themselves, which included their names, ages, nationalities, departments, and the year of the studies. Researchers' essential aim in this analysis is to pick up insights into the composition of this participants group, comprising 10 males and 10 females, subsequently contributing to a more comprehensive understanding of the setting in which research inquiries about findings were created.

With respect to nationality, participants spoke to a splendid tapestry of backgrounds, reflecting the international nature of study. Eminently, participants hailed from countries such as India, Indonesia, China, Russia, Uzbekistan, Bangladesh, South Korea, Kyrgyzstan, Nepal and France. Among these, India, Russia, and Uzbekistan were the foremost frequently represented countries, demonstrating a degree of differences within the sample. The age range of participants was very varied, traversing from 18 to 30 years. The average age of the gather was roughly 23 years, proposing a diverse extent of life encounters and viewpoints among our participants.

In this research, participants were drawn from a broad extent of departments, comprising Ph.D., Master, and undergraduate studies. The data is noteworthy concentrated within departments specializing in cutting-edge domains such as Artificial Intelligence (AI) and Big Data. Furthermore, the presence of students hailing from the International Business Management department highlighted the differing qualities of educational foundations among participants.

Participants' statistics also displayed a well-distributed extent of scholastic years, from freshman to senior students. Sophomore students shaped the largest cohort. This equilibrium permitted us to comprehensively capture a spectrum of viewpoints, enormously improving the study's profundity and understanding into the domains of AI & Big Data, and International Business Management. In addition, the incorporation of participants from unique departments, such as K-pop Arts Management, has assisted in enhancing the diversity and relevance of the research findings.

For question 2, based on the responses provided by the research participants (n=20) to explore their awareness of



virtual worlds or online environments where people can interact and create digital personas, all participants engaged with this context, contributing to a comprehensive understanding of their mindfulness and recognition with virtual universes and online environments. An overpowering larger part (n=15) confirmed that they had in fact listened about such virtual worlds or online environments (video games or social platforms).

Their reactions changed in the depth of their understanding. Fifteen, depicted virtual universes as stages where people can wear immersive adaptations like glasses and gloves, comparing the involvement to video diversions or social organizing. A male participant added, "Yes I heard about it, like uh virtual world means that where we use glasses and gloves to interact". They also related these situations with the concept of 'Metaverse', emphasizing the potential for people to lead digital lives and make unique personas. The allure of creating digital avatars was specified as an engaging viewpoint by a few participants, highlighting the intuitively and imaginative dimensions of these virtual spaces. Besides, these participants also related their information with gaming experiences, especially those that included personalizing in-game characters. This diverse viewpoint underscores a collective mindfulness and interest around virtual universes among the participants.

On the contrary, a minority of five interviewees conveyed that they had not previously experienced the concept of virtual universes or online environments with intuitively and persona-creating features. Some participants clarified their lack of recognition as stemming from constrained interest in internet-related subjects, whereas others said their recent initiation into internet use. A male participant adds, "I've never heard about that, but I'm not interested in the internet ... I read only books and I recently began using internet to be honest about for three or four years ago I started using my internet". These individuals displayed a contrast to the majority but still provided important bits of knowledge into the assorted foundations and experiences of the research participants.

Majority of the participants were aware of virtual universes and online environments competent in facilitating intuitive and the making of digital personas. Be that as it may, a notable minority had yet to come across these concepts, highlighting the varying degrees of exposure and engagement with such virtual spaces among the research participants.

The responses to question 3, which inquired about the participants' awareness of the term Metaverse and their experiences with it, along with their experiences with Virtual Reality (VR) and Augmented Reality (AR). The results revealed that, of the twenty participants, one individual expressly stated that they did not know about the term Metaverse, whereas others illustrated varying levels of awareness or some degree of recognition with the concept. Showing its developing prominence in modern talk. A male participant defines, "Metaverse is like a space in the online Internet like where you can exist in like digital form and where you can connect to different things on internet through like from inside". Despite this mindfulness, the participants' direct experience with the Metaverse was relatively restricted, with

only some mentioning prior encounters basically related to gaming or virtual world exploration. Most participants expressed that they did not have direct experience with Metaverse.

Out of the twenty interviewees, it appears that eight participants had some form of experience or exposure to Metaverse. These experiences ranged from hearing about it and having a basic understanding to more hands-on experiences with virtual reality (VR) and augmented reality (AR) technologies. A female participant said,

"virtual reality yes, we had an excursion to a museum, and we experienced using VR class um I think there can still be a lot of improvements made because in terms of quality I think um it's still a little bit not very how to say this it's still not very it the screen and the visual visually is not in a very good condition yet like there's a lot of improvements that can be made".

The remaining twelve participants did not have any direct experience with Metaverse and expressed varying levels of familiarity or curiosity about the concept. These encounters extended from utilizing AR applications and locks in VR gaming to testing with VR glasses in different settings. At last, the research evoked the recognition of all participants regarding Metaverse, with participants considering it a potential future development and recognizing its role in forming virtual intuitive and digital personas. The investigation enveloped the complete participant pool for their mindfulness of Metaverse and their discernments of its importance, whereas participant numbers for coordinate experiences within Metaverse or with VR/AR were not explicitly detailed within the responses.

In response to question number 4, participants' responses with respect to their familiarity with the Avatar term, it was apparent that the larger part of the study's twenty participants had earlier knowledge of this digital concept. A total of eighteen interviewees demonstrated their familiarity with avatars, showing varying degrees of understanding, and highlighting their usage in online environments, video games, social media, and virtual universes. A female participant affirmed, "yes, um I think Avatar is basically a digital persona that you make based on yourself".

For these participants, avatars were advanced representations of users, giving a means to interact and display themselves within the virtual domain. Participants who were already familiar with avatars regularly highlighted their versatility, permitting for customization of one's digital character. They emphasized the role of avatars in upgrading online intuitive and self-expression, especially in gaming and social media settings. participants communicated expectation for the long run development and potential of avatars in forming online encounters.

To differentiate, two interviewees conceded to having no earlier information of avatars but given quick comments once displayed with a brief description. A male participant spoke, "I've heard him about avatar this this was movie...". These discoveries emphasize the predominance of avatars in modern computerized culture and the assorted ways in which people

see and lock in with them. The participants who at first had no knowledge of avatars but were presented to the concept through a brief description, there was an eminent openness and interest. They recognized the potential centrality of avatars in online communication and representation, perceiving them as instruments for individual expression and association in virtual spaces.

In general, these findings underscore the significance of avatars as a prevailing and evolving aspect of digital culture. They function not only as digital representations but also as tools for self-presentation, communication, and identity exploration in an increasingly interconnected and virtual world. Understanding how individuals perceive and interact with avatars is fundamental for grasping the evolving landscape of online interactive and virtual experiences.

The question 5 delves into the key personal attributes that people prioritize when designing their avatars in virtual settings. Particularly, it analyzes whether respondents consider gender, facial features, skin tone, hair color and style, body shape, as well as clothing and shoes, follow-up request invite participants to supply insights into their centrality in forming their virtual representations. This analysis sought to reveal designs in avatar design choices, shedding light on how individuals express themselves, build characters, and engage socially inside digital domains.

Among the twenty participants in this study, exceedingly, gender developed as the prevailing and generally addressed characteristic, with all twenty participants recognizing its significant part in their avatar design process. This consistent center on gender highlights its centrality as a crucial angle of self-presentation and personality within the digital domain. The participants' points of view on gender were diverse, extending from those who reflected their real-life gender to others who seized the opportunity to investigate diverse gender identities, emphasizing the flexible nature of avatars in encouraging gender expression. A male participant alleged, "Maybe gender because I need to make sure that the gender that I'm choosing like either gender that I like. it shows like you, so you need to make sure that which gender you are".

Moreover, facial features possessed a central position within the talks, with nineteen interviewees highlighting their significance. A male participant expressed that "Yes I do pay importance to gender; face is quite important to me...". The confront, being an essential point of acknowledgment and interaction in virtual situations, was a basic component in conveying individual character. Interviewees expressed a desire to strike a balance between creating avatars that resembled their actual faces and experimenting with unique facial characteristics that may not be present in their physical appearances. A female participant defined,

"For me personally when I make an avatar I pay attention to each one of them each one yeah anything that specify um it's when I make an avatar it's more like I try to balance between making it look sort of like me but also like adding a little bit more stuff that I wouldn't be using in real life".

This duality underscores how avatars serve as powerful instruments for self-expression, permitting people to make

digital representations that adjust with their self-image and imaginative desires.

Sixteen of twenty participants who considered hair color and fashion as critical aspects of their avatar plans. These participants displayed a shared interest in testing with unconventional and dynamic hair choices, highlighting their preparation to withdraw from their real-world appearances and investigate imaginative conceivable outcomes in their virtual personas. Among the twenty participants in this study, ten interviewees considered skin color as a pivotal component in their avatar plan process. A male participant disclosed, "but the skin color is a bit of necessary thing hair color and style I would choose the nerdy style...". For these participants, imitating their real-world skin tones was a priority, showing a need for their avatars to closely resemble their physical appearances. This arrangement between their genuine and virtual selves proposes that, for some, keeping up a steady online personality about skin color is critical.

Alternately, the remaining ten participants approached skin color differently. They saw it as an opportunity for lively experimentation and imaginative expression. These participants were willing to deviate from their real-world skin tones, utilizing the virtual space to investigate a wide extent of skin color choices. This highlights the adaptability of the avatar creation handle and how individuals utilize it as a canvas for inventive self-presentation.

Fifteen of the participants in this study expressed a keen desire to shape their avatars in a way that reflected certain physical standards or beliefs of allure. A male participant alleged that "...body shape of course body shape should be fit...". In quintessence, they saw their avatars as an opportunity to form virtual representations of themselves that encapsulated these physical qualities. This inclination adjusts with a broader trend where individuals try to make avatars that serve as idealized forms of their real selves. In doing so, they utilize avatars to venture an image that they discover by and by engaging or in line with societal measures of excellence and engaging quality. However, it is worth noticing that five interviewees demonstrated that body shape held less significance for them, or they embraced diverse body shapes as a frame of self-expression.

Lastly, clothing and shoes choices were brought into focus by seventeen participants, exhibiting the significant part of fashion and style in avatar representation. These choices permitted participants to communicate different aspects of their identity, cultural personality, or even temperament inside the virtual world. A female participant elaborated that

"Since I'm in hijab [a garment worn by Muslim women to cover their hair] I will for sure choose hijab too. it's kind of an ethical question but I still like to choose the hijab and then body shape normal clothes that will cover the whole shape and then shows everything that is needed to resemble me so as it as I said before uh I'm going to choose a hijab because I belong to the Islamic community and according to my religion it has to recovered the hair and the body".

Whereas the responses from the larger part of participants advertised point by point insights into their avatar plan

contemplations, one participant did not give a clear reaction, clearing out the specifics of their choices dubious. All things considered, the overarching differing qualities of reactions underscores the significant centrality of avatars as devices for self-presentation and imaginative expression within the dynamic landscape of virtual environments.

Question number 6 explores the degree to which people believe a person's personality impacts the design of their avatars in virtual environments. It seeks to investigate whether respondents perceive a connection between an individual's inner characteristics, such as their personality traits, and how these traits influence the design of their avatars in virtual environments. In this research, it appears that there is a consensus among the participants that a person's personality essentially influences their avatar's design for virtual environments.

Out of the twenty participants, it is evident that a larger part, fifteen interviewees, communicated the conviction that identity plays an essential part in forming the appearance of their avatars. These participants demonstrated that people tend to plan avatars that adjust with their identity characteristics, inclinations, and self-image. They specified that perspectives like body shape, clothing fashion, and indeed the choice of haircuts are affected by one's identity. A male participant exclaimed

“I think the person's personality will influence the avatar design because mostly people want the avatar they look like him; so, if they will design their avatar they think about their uh their body shape or their skin color maybe yeah”.

However, it is worth noticing that not all participants shared this viewpoint. A smaller number of five participants held to some degree a distinctive view. A female believed,

“... um one person's personality can make them design an avatar that looks exactly like them, but another personality will make them create something totally different from their actual appearances they can make something funnier or like yeah something absurd or something like that”.

These individuals recommended that whereas identity does impact avatar design to some degree, it may not be the sole determinant. They highlighted the potential influence of external variables such as social foundation, religion, and the crave for experimentation within the virtual world. In general, fifteen participants recognized that someone's personality plays a significant role in forming their avatar's design, reflecting a solid association between one's virtual representation and their real-world characteristics and inclinations.

The question 7 digs into two key aspects of Metaverse avatar usage. Firstly, it seeks to gauge the emotional connection individuals have with their avatars in these digital environments. Secondly, it explores whether people view their Metaverse avatars as authentic expressions of their true selves. The responses to question 7, along with its sub-questions, reveal a spectrum of sentiments among the participants in terms of the profundity of association to their Metaverse avatars, suppositions separate. A significant portion, (n=12),

conveyed either a limited or superficial connection to their digital representations. They view these avatars as digital constructs, existing exclusively within the virtual realm, and do not feel deeply attached to them. Among these participants indeed responses went as reserved as to propose that the sudden loss of their avatars would have small to no mental affect. A female participant alleged,

“um a little I think there's a little bit of connection but not to an extent that is very too much not too much I mean it wouldn't affect me psychology if suddenly the Avatar is gone or something like that uh I mean if the Avatar is suddenly gone like it wouldn't affect me too much so there's not much of attachment actually...”.

For them, the avatars are functional substances instead of candidly critical extensions of themselves.

Conversely, eight interviewees passed on an important degree of connection to their Metaverse avatars. They articulated that these avatars serve as a shape of individual expression and execution. This viewpoint implies that these people contribute a portion of themselves in forming their virtual personas and, as a result, create an important association with them. A female aforesaid, “Of course, because that person is kind of mine performance the showing something because it's my design personal design...”.

Whereas this association may not be as significant as real-world connections, it is demonstrative of a certain level of engagement with their advanced partners. Regarding whether avatars within the Metaverse are an expression of one's true self, participants held shifting convictions. A majority, comprising (n=11), did not support the idea that their avatars really represent their deepest selves. They emphasized that these digital developments are, by nature, counterfeit and may not reliably reflect their real-world personalities. Instead, they see avatars as performative entities, designed for others to see, instead of true reflections of their true identities.

On the other hand, a smaller yet critical group of six participants held the point of view that avatars in Metaverse do convey certain features of their veritable selves. They contended that avatars can reflect components of their identities, inclinations, and how they wish to show themselves within the virtual domain. A male spoke, “...I don't fully believe on avatar is an expression of one true self I think it will not be able to like to express yourself you know fully you will not be able to express fully so that's why”. Whereas not fundamentally identical to their total selves, these participants saw their avatars as vehicles for self-expression and a means of revealing perspectives of their true personalities.

The question 8 explores the avatar choices individuals would make when entering a virtual educational environment, such as a Metaverse virtual classroom, in the role of students. It inquires if interviewees would alter their current avatars for this setting and, if so, how they would do so. Conversely, if they would not make changes, the address seeks to get their reasons for this choice.

Among twenty participants, it appears that eleven interviewees would be inclined to create changes to their

avatars when entering a virtual educational setting. These changes regularly revolve around clothing, with participants expressing a desire to adapt their avatars' clothing to suit the convention and decorum regularly anticipated in an instructive environment. They contemplate supplanting more casual or colorful clothing with formal or uniform-like outfits, adjusting their avatars with the guidelines of a classroom setting. A male participant stated,

“yes of course I will change their uniform like uh in my uh if I design my avatar for the concert or some kind of events I will design it may uh they're close more colorful but if I change it in educational environment then I will uh make their dresses like more uh formal like which is a very important or very likely to them to the educational environment like a simple shirt or a pant okay”.

This recommends that participants perceive the significance of maintaining a certain level of professionalism and similarity within an instructive setting, indeed within the virtual realm.

On the other hand, about seven interviewees conveyed the intention to keep their avatars unaltered when entering a virtual classroom. They justified this choice by highlighting the interesting and fun aspect of presenting themselves through avatars in an academic context. A female participant alleged,

“Maybe no because that my avatar is a representation of myself and a school is also a platform where I'm supposed to express myself that's a way of my expression so unless I'm not very inappropriate then no”.

These participants see the virtual environment as an opportunity for self-expression and do not feel compelled to comply with traditional classroom norms. They appreciate the adaptability and freedom that avatars offer in terms of displaying aspects of their personality that might not be as promptly obvious within the physical world.

Moreover, there were two interviewees who emphasized the need for adaptability in their responses. They demonstrated that their choice to modify or maintain their avatars would depend on the circumstances, such as the instructive institution, the requirements set by the learning platform, or the cultural context. A male uttered, “...I feel like you wouldn't need to unless told to or something like that okay so maybe I would say no you probably wouldn't need to unless said so most of the time I would say no.”. This adaptive approach illustrates an openness to alter their avatars based on external factors and suggests a practical perspective on avatar design.

In outline, participants' responses to this address uncover their mindfulness of the contextual expectations inside instructive situations. While few select alterations to adjust with routine classroom decorum, others cherish the expressive potential of avatars and are less slanted to create changes.

Question 9 of this research explores whether respondents believed that a student's choice of avatar design could impact their virtual educational experiences. If respondents answered positively, they were asked to explain how they think avatar design influences these experiences. If they answered negatively, they were encouraged to provide reasons for their

belief that avatar design is not a significant factor. From the twenty, it appears that most participants, sixteen, do not accept that a student's avatar design will essentially influence their virtual educational experiences. A female participant expressed, “I think no - not as much as it's just an image it's not the I think image does not influence it does not affect his educational performance.” They generally hold the view that the primary purpose of engaging in a virtual educational environment is to acquire knowledge, and the appearance of one's avatar should not have a significant impact on their ability to learn.

On the contrary, a minority of four participants communicated the conviction that a student's avatar plan may possibly influence their virtual educational experiences. They said variables such as distraction, the need for an aware and suitable appearance, and the possibility that a well-designed avatar might improve the by and large instructive encounter. A male participant elaborated,

“Yes, probably uh if you can freely design your avatars you would probably enjoy it more because you would feel the freedom that you can control yourself with but if you are forced to make like a faceless just shadow and everyone else is like the same thing then you would probably feel a bit like uh constrained”.

In outline, most participants do not think that a student's avatar plan features a critical effect on their virtual educational experiences

The question 10 of research explores the influence of avatars and Metaverse educational platforms on students. The primary question asks if avatars contribute to increased socialization on these platforms. Subsequently, with sub questions, it assesses the effectiveness of educational Metaverse platforms in meeting students' needs and potentially improving attendance. The research also investigates Metaverse's potential to enhance students' critical thinking, problem-solving abilities, and creativity of students.

Based on the collected responses, total of twenty interviewees involved; It is important to note that the participants providing responses varies across the different questions, regarding the impact of avatars on students' sociability within Metaverse educational platforms, eleven interviewees responded affirmatively, while nine offered responses that were either uncertain or did not provide a clear yes or no opinions. A female participant responded that “I think so because you're not face to face so it's maybe easier for maybe introvert people to express them themselves...”.

When evaluating the effectiveness of educational Metaverse platforms in meeting students' educational needs and demands, three participants expressed a specific yes, while ten expressed uncertainty or mixed opinions, and seven interviewees distinctive uncertain or no. A female believed,

“... I couldn't get the interaction with the professor and interaction with other people which is crucial for me to get the topic for example and like uh sitting on one place too much in three hours I don't like it. I don't think that Metaverse will meet the student's educational needs and demands...”.

In the context of attendance rates in Metaverse-based instructional environments, nine believed that student attendance would rise. A male aforesaid,

“... Students attendance rate will increase on Metaverse based instructional, yes, I think so it needs um that everyone has equipment can access to Metaverse on and if the constants really like fun and making an interest to the students it will increase the rate of attendance...”.

Three participants alleged it would not increase, and eight interviewees did not offer a certain response.

In terms of the potential contribution of Metaverse to students' critical thinking skills, fourteen interviewees believed it would have a positive impact, a female said,

“...I think in a big perspective it will create a very critical thinking skill it will increase I guess I strongly agree with this I think we will see everything we will create our own ideas to create that world because in better ways I think we create in my perspective we create our own world in that one I think we will be more like uh we will create in a big demand we will create now we don't have that much if we study on this one I think if we study more Metaverse we will learn a lot of things like how can we predict some stuffs...”.

As six interviewees did not provide a clear response. Similarly, for students' problem-solving abilities, ten interviewees anticipated improvement, a female participant spoke,

“...yes uh maybe problem solving like for example if a problem we cannot really visualize in real life like about data visualization and stuff like that or any topic for that matter so if that problem is presented to them as in a pictorial form through the Metaverse like imagine in biology like cells and stuff how they diffuse so maybe if a student sees it will be they will um understand the concept better and the problem better so they will think in different ways...”.

While ten did not offer a decisive response. Finally, with regards to students' creativity, seventeen believed that Metaverse would enhance creativity, a female participant added,

“...student's creativity, is possible because I think official world is a space that can alleviate our creativity because there are a lot of more possibilities about what kind of the things that you can do in the virtual world are more than what you can do in real life so I think you can increase your create creativity in that way”.

As three interviewees did not provide a clear reaction. These responses collectively offer insights into the diverse perspectives on the role of avatars and Metaverse platforms in shaping students' educational experiences and skills.

Question 11 digs into the visions and perspectives of individuals regarding whether educational institutions should promote or mandate the application of avatars within virtual classrooms or learning environments. Among the twenty participants overviewed, suppositions on whether educational institutions should encourage or require the use of avatars in virtual classrooms or learning environments varied broadly.

Outstandingly, four interviewees supported the encouragement of avatars, particularly for college or high school students, as they believed it could give novel experiences. A male participant alleged,

“I think because it makes classes more interesting and I think attendance will be much higher than now I think yeah, it's going to they it would be better to if they will encourage them to use their virtual avatar in classrooms and learning environment”.

However, they cautioned against utilizing avatars for exceptionally young children due to potential developmental impacts. On the contrary, a predominant viewpoint held by six interviewees, was that the utilize of avatars ought to be entirely optional, a female participant aforementioned, “I think it should be optional um I don't think the educational institution should encourage about it because it's their own choice if they want to do it or not”, emphasizing individual choice.

In the meantime, another three interviewees proposed that whereas not required, institutions may encourage avatars as an experiential component restricted to a few classes. They viewed this as an opportunity to present students to modern technology. Furthermore, four individuals suggested a gradual adaptation of education to the virtual reality environment, advocating the promotion of virtual reality headsets to students for firsthand experiences. A male participant articulated,

“I think require, Metaverse encourage or require and they should step by step to encourage the Metaverse ...not just fast way I think because we have learned from the school years we have learned to attend classes...”.

Besides, these four participants communicated good faith about the positive effect of avatars, with some specifying expanded engagement and participation. Two participants were dubious about whether avatars ought to be required, recognizing potential benefits but addressing their need in all educational settings. A single participant emphasized that the focus of instructive institutions should stay on education itself, rather than on the design of avatars, communicating concerns about distractions. Lastly, two interviewees speculated that while avatars might not be required as of now, they may end up a requirement within the future, underscoring the need to empower and give alternatives for students. In conclusion, these differing perspectives among the twenty participants highlight the complexity of the wrangle about encompassing the use of avatars in education.

The question 12 presents a scenario where participants were asked to envision themselves in a virtual classroom within the Metaverse, using avatars as their digital representations. Sub questions, inquiries focus on the potential benefits of using Metaverse for education. The second question explores whether participants believe that the educational use of Metaverse can enhance students' learning experiences. The third question investigates whether participants think Metaverse encourages greater student engagement and participation. Two comparative questions follow the others. The fourth question assesses participants' preferences between a Metaverse-based learning environment and a Zoom-based

virtual classroom. The fifth question extends this comparison to traditional face-to-face learning environments.

Among the twenty participants, the majority shared their passion and interest about the prospect of learning in a Metaverse-based virtual classroom using avatars. Particularly, eighteen out of the twenty participants communicated enthusiasm for this Metaverse learning environment. A male participant mentioned, "I would feel excited and it's something new for me, so I'll be excited and glad to attend to that class...". They depicted the idea as energizing and interesting, highlighting their interest in investigating this inventive instructive approach.

With respect to the potential benefits of educational Metaverse usage, nineteen interviewees out of the twenty participants believed that it might essentially improve students' learning experiences. A male participant expressed, "...the using of Metaverse it could really improve their digital experience and digital skills some students so yes...". They emphasized the advantage of visualizing complex concepts and engaging in practical activities inside Metaverse. Moreover, interviewees highlighted the potential for increased interaction with virtual environments and educators.

Concerning student interest in educational experiences, the consensus was that Metaverse could indeed encourage more prominent engagement. Seventeen interviewees out of the twenty participants shared this view. A female participant alleged,

"...I think yes, Metaverse encourages student's participation in education I think yes because I personally believe whenever I saw any new or advanced technology I am interested to join there so if students' things like me I think most of the people think like that so they will try to at least get in there to see what's new there. Metaverse based learning and Zoom page turning environment, yes because I prefer ...".

They emphasized that the secrecy and immersive nature of Metaverse could help overcome boundaries to participation, particularly for students who might be reserved in traditional classroom settings. When it came to preferences, a considerable number, fifteen interviewees out of the twenty participants, communicated an inclination for a Metaverse-based learning environment over Zoom-based learning. They cited Metaverse's capacity for more engaging and interactive experiences as an essential reason for this inclination. A male participant expressed, "...prefer Metaverse based learning environment of course because it's more interesting Zoom is like a regular class but in front of the screen...".

However, in terms of a choice between Metaverse-based learning and in-class face-to-face learning, a significant majority, sixteen out of the twenty participants, inclined towards the former. They emphasized the importance of personal interaction, gestures, and the unique classroom atmosphere in traditional face-to-face learning. A female participant mentioned,

"...for me personally like spending too much time in a virtual world can make me feel more tired I don't know how that happens but for me um being in the real physical world

brings me more to the present time which like helps with my whole condition of learning like it helps me learn better when I'm in the good environment in real life".

The question 13 probes respondents' perspectives on the transformative potential of avatar-based education in reshaping traditional education models. Subsequently, if respondents acknowledge this potential for revolutionizing education, they are prompted to elaborate on the specific ways in which avatar-based education might enact such change. Among the twenty participants, seventeen interviewees expressed confidence in the potential of avatar-based education to revolutionize traditional education models. A male participant articulated that,

"...yes I think so it can because in in traditional classes like uh we are just in a same room with the with the same kind of environment but in in Avatar based educational institutions you can use you can uh like change your environment by changing some uh if you have a settings option where you can um you want to change the color of your uh color of your room where the you are learning or you can want to change the your book color or something kind of that you can do it so I think it will change the traditional method which we are like uh performing in in our classes".

They highlighted various reasons for their optimism, such as the ability to customize learning environments, the potential for immersive virtual reality experiences, and the capacity to bridge geographical distances for worldwide education. These participants believed that Metaverse could significantly impact the way students learn and engage with educational content.

However, three interviewees were more skeptical about the extent of this revolution, communicating concerns about the restrictions of technology and its failure to completely replace traditional education. They emphasized the importance of mixing avatar-based instruction with traditional methods or progressing existing educational frameworks. A male participant expressed, "Well I'm not sure if it's revolutionized it's more evolution because it was like gradually coming to this but yeah it's going to impact beneficially..".

Question 14 probes into participants' opinions regarding the potential of visually enriched learning platforms, like those found in Metaverse, to positively impact long-term knowledge retention among students. Among the twenty participants who responded to this question, there was a striking disparity in opinions regarding the potential of visually enriched learning platforms, such as those within Metaverse, to enhance long-term knowledge retention for students. A critical majority, comprising thirteen interviewees, believed that visual experiences in Metaverse could indeed contribute to better long-term retention of knowledge. A female participant stated, "Sure of course I think that the visualize it it's uh I think it's um all people know that visualizing can help like memorize information better and easier of course for chat for children for adults that's fine.". They cited the engaging and novel nature of visual experiences as key components in this belief.

On the other hand, seven interviewees held a more skeptical perspective on the effectiveness of virtual learning

environments for long-term knowledge retention. A female participant specified,

“I have a doubt here because I saw when I do online classes my attention is a bit lower than the face-to-face classes so I don't know what will happen but um I think if people just not only enjoy but also give more attention here I think it will be a positive side for them but if it's not then it can harm them in the wrong ways”.

These individuals expressed concerns about the possible downsides of increased screen time, decreased engagement in virtual settings, and a preference for real-life learning experiences. This cluster of responses underscores the mixed perceptions among participants.

Question 15 investigates the topic of avatar customization within educational Metaverse settings and raises several critical considerations. It begins by asking whether students should be granted complete freedom in designing their own avatars. However, it follows up by probing whether such ultimate freedom could potentially give rise to issues within the learning environment. The question then extends its focus to professors, inquiring whether they should also have the full freedom to design their avatars in educational Metaverse settings. The question then explores the necessity of ethical guidelines or regulations concerning avatar use in educational contexts. Based on the responses from the participants, it is evident that views on the freedom to design avatars in educational Metaverse settings are diverse.

Out of the twenty participants, ten interviewees expressed that students should have the freedom to design their avatars, but with certain confinements in place to ensure appropriateness and anticipate distractions. A female participant believed,

“Yes, they should have freedom but not full freedom that they can go like a cow or a vampire. I don't think that should be done as I told you they should be a little neat and tidy they should be respectful of the educational environment...”.

They argued that whereas ultimate freedom could be a concern, maintaining a balance between creativity and decorum is crucial.

Differently, six interviewees believed that professors should also be managed a degree of freedom in designing their avatars, but they emphasized that this freedom should be exercised responsibly, with appropriate attire and professionalism in intellect. A female participant alleged, “...I also believe for professors they should have some limitations they should also dress appropriate to the setting which is a classroom so they should dress in the proper attire to appear for class...”. They proposed that professors should follow similar guidelines as students to preserve a cohesive learning environment. Twelve interviewees backed the implementation of ethical guidelines and regulations for avatar use in educational settings. They stressed the significance of preserving a respectful and focused learning environment and avoiding offensive or distracting avatars. A male participant exclaimed, “...I said so insulting offending it's not it shouldn't be allowed...”. These participants viewed ethical guidelines as

fundamental to creating a conducive educational environment in Metaverse.

The question 16 inquiries about participants' hesitation regarding the utilization of avatars within educational environments. Based on the responses of the twenty participants regarding their hesitations around the use of avatars in educational settings, it is evident that the majority expressed small to no hesitation. Fourteen interviewees indicated that they had no hesitation or concerns about using avatars for educational purposes. A male participant aforementioned, “I don't have any hesitations if I had a chance I would use it.”. They generally appeared open to the thought of avatars and indeed expressed enthusiasm or curiosity about attempting something new. They specified a lack of hesitations since they considered avatars as an instrument that would not significantly influence their learning experience.

Yet, six interviewees did mention some reservations or concerns related to avatars in educational settings. A few of these concerns included the need for legitimate ethical guidelines and privacy protection. A female participant spoke, “well if there is a proper ethical guideline for being provided and all those kinds of things I don't really have anything to say about that I think it will be a fun experience to try for once.”. They emphasized the significance of having guidelines in place to ensure that avatars are used consciously and to prevent potential issues related to privacy and individual boundaries.

Question 17 scrutinized participants about their personal concerns, either as individuals or students, regarding the concept of Metaverse. Out of the twenty participants, a striking larger part, comprising twelve interviewees, expressed their personal concerns regarding Metaverse. These concerns spanned a range of critical considerations, reflecting the multifaceted nature of this rising digital realm. Privacy and data security emerged as a prominent issue, with these participants voicing worries about the security of their personal information within Metaverse. These individuals highlighted the importance of safeguarding their data from potential misuse or breaches. A female participant spoke,

“If I think individually I was excited but some sometimes we have like hesitation about our data's because sometimes we must put our personal data we have some like kind of stuff with that because sometimes we learn like some companies took data without our knowledge I think if our data is safe it will be really good because we can use it freely as a student I think the same thing because the most important thing is our data if your data is not like if that is more safer it will be really good”.

A recurring subject among participants was the desire for unique and distinct avatars within the virtual world. Nine interviewees expressed the need for their avatars to reflect their individuality, cultural identity, or religious beliefs. For instance, one participant, belonging to the Sikh community, emphasized the significance of being able to customize their avatar to incorporate religious attire like a turban. This sentiment resonated with others who sought to preserve their cultural heritage and unique identities.

Concerns about the potential physical and mental wellbeing implications of prolonged engagement in Metaverse

were also raised by these participants. They emphasized that excessive screen time and extended periods of immersion in virtual environments could be physically demanding and indeed inconvenient to well-being. A female participant voiced,

“... I don't really enjoy being in front of my screen or in a visual or digital environment too much because it can be physically demanding for me so yeah that's my main concern when it comes to Metaverse actually I think for education to sum it up my opinion is that Metaverse will be a good addition for students to try this new technology but in terms of primary environment I still prefer the offline face-to-face setting”.

Ethical considerations played a pivotal role in the discussion, with participants focusing on the importance of building up clear guidelines and regulations for Metaverse usage. Participants raised their concerns related to access and affordability. They highlighted that not all students have access to the fundamental technology, such as VR glasses, which might prevent their participation in a Metaverse-centric educational environment. A male participant alleged, “I think it's equipment you know to use Metaverse you must have a VR glasses right if you don't have them you cannot use and not all the students cannot afford it so that's the only problem I think.”.

Interestingly, eight interviewees did not express critical reservations about Metaverse. Instead, they exhibited excitement and optimism about its potential applications in education and other domains. A male participant exclaimed, “No, I don't have any concern about it, yeah because as a student myself the thought of Metaverse education it sounds exciting.”. For them, Metaverse represented an opportunity for improved learning experiences and creative exploration, with the belief that its positive impacts could exceed potential drawbacks.

The final question, Question 18, encourages participants to reflect on the entirety of the discussion and consider whether they would enthusiastically embrace the opportunity to engage in virtual education within Metaverse using their avatars today. If participants respond positively, they are encouraged to provide reasons for their acceptance, offering insights into what motivates their enthusiasm for virtual education. Conversely, if participants decline the offer, they are encouraged to provide an explanation for their reluctance, exploring the factors that inform their decision.

Out of the twenty participants, a significant majority of sixteen interviewees expressed their willingness to accept the opportunity to participate in virtual education inside Metaverse using their avatars. A female participant exclaimed,

“Yes, why not like I mean I'm open-minded so and I don't know if this kind of education will like to be efficient with I mean with me so I mean we need to like uh experience new things if you want to learn so why not”.

Their motivations for acceptance varied, with many highlighting the appeal of a novel and immersive learning experience. Participants saw it as an opportunity to delve into unconventional and unfamiliar areas while encountering educational techniques that could be more captivating and

interactive compared to conventional methods. The participants sixteen were open to the idea of virtual education in Metaverse emphasized the potential for individual development and learning. They saw it as an opportunity to experiment with avatar customization and to connect with friends' avatars, making the learning process more social and enjoyable. A few of them communicated curiosity about the practical applications of Metaverse, particularly in areas like software engineering, where hands-on experience and real-world simulations could be highly beneficial.

However, it's worth noticing that a minority of four interviewees expressed reservations about accepting this opportunity. A female participant said, “No, I mean as my primary source of education no I would like to try it of course but I have a very short attention span and since I'm still hiding my real self is still hiding behind the screen I would probably fall asleep...”.

Their reasons for hesitance included concerns about avatar creation, religious beliefs, potential distractions, and the preference for traditional in-person learning. A female participant articulated, “...I don't like creating a thing and if I tell about my religion also it is restricted to create your own image it actually can contrast with my own belief so that is why I'm not interested in it.”. These contradicting voices emphasize the need for a balanced approach to integrating Metaverse into education, considering both its benefits and potential challenges.

IV. RESULTS

The abridged overview delivers a succinct and thorough account of pivotal outcomes, encapsulating demographic, cognizance of virtual environments, preferences in avatar design, emotional associations, and viewpoints on Metaverse-centered education. The systematic presentation within Table 2 enables a prompt comprehension of varied participant attitudes, inclinations, and considerations.

TABLE II. THE EXPRESSION OF AVATAR PREFERENCES AND USER EXPERIENCES

Interview Questions	Summary of Results
Demographic Overview: question 1	Participants introduced themselves, mentioning their country, age, the department they study in, and the academic year (freshman, sophomore, junior, or senior).
Awareness and Experiences: question 2 and 3	Each participant interacted with virtual environments, exhibiting diverse levels of familiarity with the term Metaverse. The widespread knowledge of avatars highlighted their versatility in online interactions and digital representation.
Avatar Design Preferences: question 5 and Personality Influence: question 6	In the realm of avatar design, participants regarded gender, facial features, and attire as pivotal elements. A consensus of fifteen participants affirmed the substantial influence of personality on avatar choices, while five underscored the impact of external factors.
Emotional Connection and Authenticity: question 7 and Avatar Choices in Education: question 8	Twelve participants articulated restrained emotional affiliations with avatars, whereas eight reported a profound connection. Among them, eleven intended to adjust avatars for virtual education, prioritizing professionalism, while seven favored maintaining unaltered avatars for the purpose of self-expression.



Interview Questions	Summary of Results
Impact on Education: question 9 and 10; Promotion of Avatars question 11	Sixteen participants held the belief that avatar design has a marginal impact on education, while four perceived the potential for it to enhance engagement. Participants displayed diversity in their perspectives on the impact of the Metaverse, emphasizing socialization benefits but expressing uncertainties regarding its effectiveness in education. Regarding the promotion of avatars, opinions diverged, with preferences for encouragement, optional use, or gradual adaptation.
Metaverse-Based Education: question 12, 13 and 14	Eighteen participants conveyed willingness for education within Metaverse, foreseeing enhanced learning experiences and heightened engagement. Seventeen participants endorsed the transformative potential, while three participants raised concerns. Thirteen participants acknowledged the positive impact of visual experiences on knowledge retention.
Avatar Customization: question 15 and Hesitations: question 16 and 17	Participants endorsed the customization of avatars for both students and professors, provided there are ethical guidelines in place (question 15). Fourteen participants exhibited an absence of reservations, underscoring their openness to avatars, while eight participants expressed concerns regarding privacy, data security, distinctive avatar representation, and issues related to access.
Willingness to Engage: question 18	Sixteen participants demonstrated a willingness to engage in virtual education within Metaverse, attributing it to the allure of novel experiences. Conversely, four participants hesitated, citing concerns related to attention span, distractions, and a preference for traditional learning.

The investigation revealed varied viewpoints regarding Metaverse education, underscoring the necessity for ethical guidelines, customization possibilities, and the resolution of issues related to privacy, access, and engagement. Participants expressed enthusiasm for inventive learning experiences while stressing the significance of maintaining equilibrium between technological progress and traditional educational principles.

V. DISCUSSION

This qualitative paper furnishes a comprehensive synopsis of pivotal outcomes, encompassing insights into virtual environment awareness, preferences pertaining to avatar design, emotional connections, perspectives on Metaverse-centered education, and the disposition towards engagement.

A. Avatar Design Preferences

Examining participants' inclinations towards avatar design and how personality influences these selections. Findings indicate that participants view gender, facial features, and attire as pivotal aspects of avatar design. A unanimous viewpoint among majority (fifteen) participants emphasizes the significant role of personality in shaping avatar choices, while minority (five) participants draw attention to the influence of external factors. In the context of virtual learning environments, avatars serve as digital representations of users and have the potential to play a significant role in enhancing student engagement (Nowak & Fox, 2018). This insight forms the basis for understanding the subtle intricacies of avatar design in Metaverse.

B. Emotional Connections and Authenticity

Examine the emotional connections with avatars and their relevance in the context of education, pertaining to the responses provided by participants. Findings depict a nuanced spectrum of reactions, with noteworthy majority (twelve) participants indicating reserved emotional connections and few (eight) noting a deep-seated bond. Yee and Bailenson (2007) discovered that employing avatars resembling one's physical self-heightened connection and engagement in virtual environments. Furthermore, a substantial majority (eleven) participants express the intent to modify avatars for virtual education, emphasizing professionalism, while fewer than half (seven) participants select to maintain their avatars unchanged as a means of self-expression. The discussion, influenced by literature such as (Ducheneaut et al., 2009; Hooi and Cho, 2012), emphasizes the significance of deliberately choosing and adjusting diverse physical attributes of avatars, including gender, skin tone, hairstyle, height, and facial features. These qualities significantly contribute to the overall appearance and representation. This highlights the complex nature of the user-avatar relationship.

C. Avatars: Shaping Education, Fueling Promotion

Examine the perceived influence of avatar design on education and attitudes toward avatar promotion. The findings illustrate diverse viewpoints: most participants perceive avatar design as having a minimal impact on education, while more than a majority (sixteen) view avatar design as having a marginal effect on education, and fewer than a quarter (four) recognize its potential to enhance engagement. The diverse stances on avatar promotion underscore the necessity for adaptability, encompassing preferences that range from endorsement to allowing optional use or gradual implementation.

D. Metaverse Education: Elevating Learning, Igniting Engagement

Explore participants' outlooks on Metaverse-based education. The findings unveil a majority (eighteen) of participants expressing enthusiasm for Metaverse education, envisioning enhanced learning and heightened engagement. More than half (seventeen) participants endorse its transformative potential, while few (three) express reservations. Majority of (thirteen) participants acknowledge the positive impact of visual experiences on knowledge retention. These results emphasize the potential for groundbreaking learning experiences within Metaverse.

E. Avatar Customization and Associated Reservations

Examine viewpoints on customizing avatars and concerns regarding privacy and access. The findings demonstrate support for avatar customization among both students and professors, contingent on the existence of ethical guidelines. Substantial majority of (fourteen) participants exhibit no hesitations, while limited (eight) participants articulate concerns about privacy, data security, unique avatar representation, and access-related issues. Belk (2013) observes that users perceive avatars as reflections of themselves. The customization of avatars, as investigated by (Ducheneaut et al.,

2009), involves choosing and adjusting physical attributes, thereby molding the representation of one's identity. This underscores the significance of ethical considerations in integrating avatar customization within educational environments.

F. Readiness for Involvement within Metaverse

Examines participants' readiness to participate in virtual education within Metaverse. The findings indicate that majority (sixteen) participants exhibit eagerness for innovative experiences, while few (four) express reservations, citing concerns about attention span, distractions, and a preference for traditional learning. Participation in virtual reality simulations in medical education leads to improved proficiency, as evidenced by Kizilcec et al. (2017). The application of virtual reality technology holds the potential to enhance cognitive functioning and evoke autobiographical memories, as highlighted by Liu et al. (2023). This array of perspectives underscores the importance of addressing individual preferences and concerns to guarantee effective engagement in virtual education.

In conclusion, the discussion section offers a comprehensive insight into participant perspectives, uncovering nuanced attitudes towards virtual environments, Metaverse education, and avatar customization. These diverse viewpoints highlight the complexity of implementing educational initiatives in Metaverse, emphasizing the crucial role of ethical guidelines, customization options, and addressing privacy, access, and engagement issues. The findings contribute to the ongoing discourse on integrating virtual environments in education, advocating for a balanced approach that integrates technological innovation with traditional educational principles.

VI. CONCLUSION

The findings section delivers a succinct yet comprehensive synthesis of critical outcomes, spanning virtual environment awareness, avatar design preferences, emotional connections, and perspectives on Metaverse-centered education. The study unveils a diverse range of viewpoints regarding Metaverse education, underscoring the importance of ethical guidelines, customization options, and addressing privacy, access, and engagement concerns. Participants show eagerness for inventive learning experiences, highlighting the significance of striking a balance between technological advancements and traditional educational principles.

The discussion explores avatar design preferences, emotional connections, perspectives on Metaverse-centered education, and willingness to engage. Participants consider gender, facial features, and attire pivotal in avatar design, highlighting the influential role of personality. Emotional connections with avatars vary, ranging from reserved affiliations to insightful connections.

The perceived impact of avatar design on education and opinions regarding avatar promotion reflects a range of perspectives. While most believe it has a minimal effect on education, a substantial number of views it as having a marginal impact, and a smaller segment acknowledges its

potential to enhance engagement. Attitudes towards avatar promotion differ, emphasizing the importance of flexibility in approach. Concerning education in Metaverse, most participants show excitement, anticipating improved learning experiences and increased engagement. While the majority supports the transformative potential, a small number of voice concerns. Support for avatar customization is present, subject to ethical guidelines, although some participants have reservations concerning privacy and access.

In summation, this qualitative study offers an extensive synthesis of crucial findings, illuminating aspects such as awareness of virtual environments, preferences in avatar design, emotional connections, perspectives on Metaverse-centered education, and readiness to participate. The results contribute to the ongoing dialogue regarding the integration of virtual environments in education, underscoring the significance of ethical considerations, customization alternatives, and the resolution of issues related to privacy, access, and engagement.

A. Implications for Practice

The study highlights the imperative requirement for ethical guidelines in virtual learning environments, recognizing the diverse perspectives prevalent in the field. It urges educators and administrators to prioritize the formulation and communication of these standards to effectively guide participants within the expansive realm of Metaverse. The enthusiasm observed for innovative learning, especially in the realm of avatar customization, creates an encouraging opportunity for educational practitioners. Embedding customizable features into virtual platforms, coupled with an unwavering commitment to ethical standards, holds significant potential for elevating participant engagement and overall satisfaction within the educational experience.

The study underscores the crucial need for educators to strike a balance between technological advancements and traditional educational principles, emphasizing the integration of innovative technologies from Metaverse. This approach is recommended to create a holistic and adaptable learning environment while preserving the core tenets of effective education.

Additionally, recognizing the varied emotional connections individuals have with avatars and their perspectives on Metaverse-centered education, the study advocates for imperative awareness and training programs for both educators and participants. These programs aim to cultivate a comprehensive understanding of the influential role of personality in avatar design and its potential impact on engagement. Such initiatives are deemed necessary for fostering an inclusive and effective educational experience within the dynamic landscape of Metaverse.

The study highlights the importance of flexibility in both avatar design preferences and promotional strategies, recommending platforms to provide diverse customization options and adjustable promotional efforts. Acknowledging concerns raised by a minority of participants in Metaverse education, educational practitioners are advised to proactively address privacy, access, and engagement issues. Establishing

an open dialogue and implementing strategies to alleviate apprehensions can contribute to a more inclusive and satisfactory learning experience.

Leveraging the majority's enthusiasm for the transformative potential in Metaverse-based education, educators should explore innovative learning experiences, including virtual reality simulations and immersive scenarios, to enhance outcomes and engagement. Simultaneously, supporting avatar customization requires practitioners to maintain a balanced perspective, considering ethical guidelines and addressing privacy and access concerns. Clear guidelines for customization and promotion of responsible avatar choices contribute to a positive and inclusive virtual learning environment.

In summary, the practical implications emphasize the necessity of a deliberate and flexible approach to incorporating virtual environments into education. Professionals should give priority to ethical considerations, present opportunities for customization, strike a balance between technological progress and traditional principles, offer awareness and training, and address concerns. These actions are crucial to guaranteeing a positive and effective educational experience within Metaverse.

B. Implications for Further Research

It effectively suggests that future researchers can explore the development and impact of ethical frameworks in virtual learning environments, with a specific emphasis on understanding how guidelines intricately shape participant behavior. Insights gained can refine ethical practices within the dynamic realm of Metaverse. It effectively suggests conducting comprehensive studies on how avatar customization influences engagement, learning outcomes, and the overall virtual learning experience. A nuanced understanding of these effects will facilitate the enhancement and fine-tuning of customization features to align with educational objectives and participant preferences.

Researchers can conduct longitudinal studies to comprehend how Metaverse-based education influences academic performance, offering insights into sustained immersive learning experiences. Explore effective strategies to alleviate participant concerns, particularly regarding privacy, access, and engagement in Metaverse education. Identifying successful interventions contributes to a robust framework for managing apprehensions.

These research paths strive to enhance comprehension in Metaverse-centered education, adding to continuous dialogues on virtual learning environments and fostering the creation of more efficient and inclusive educational methodologies.

C. Study Limitations and Delimitations

In this research paper, it is imperative to recognize the limitations. The utilization of snowball sampling, although an effective approach to involve difficult-to-access groups, comes with the potential drawback of introducing sampling bias, depending on participant referrals. Including participants from diverse backgrounds enhances the study but poses challenges

in managing variations in experiences and opinions, potentially complicating categorization and analysis.

Similarly, despite meticulous efforts for consistency, inherent subjectivity in structured interviews persists due to subtle interviewer cues, impacting data consistency. The extensive requirements of structured interviews necessitate considerable time and effort, restricting the attainable sample size. This limitation might jeopardize the breadth of data, potentially missing specific perspectives within the study's scope.

Delimitations include restricting participant inclusion to the age range of 18 to 30, constraining the exploration of perspectives beyond this demographic. This limitation may result in the experiences and viewpoints of individuals older or younger not being adequately represented. Correspondingly, presuming participants possess a certain degree of familiarity with virtual universes and Metaverse establishes a delimitation. This assumption might inadvertently omit perspectives from individuals with limited exposure to such technologies.

Adroitly acknowledging and maneuvering through these inherent limitations and delimitations is pivotal for a nuanced interpretation of the study's findings. A transparent acknowledgment of these boundaries not only elevates the credibility of the research outcomes but also establishes a robust foundation for subsequent inquiries in this dynamic and evolving field.

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AUTHORS` CONTRIBUTIONS

All authors have participated in drafting the manuscript. All authors contributed equally to the manuscript and read and approved the final version of the manuscript.

CONFLICT OF INTEREST

The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

DATA AVAILABILITY

The data supporting the findings of this study are available upon request from the authors.

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