"Breaking the boundaries of nature"
- Students' Perceptions of Metaverse Shaping Digital Future

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Abstract

This exploratory study examines young people's perceptions of metaverse and its potential: how they understand the concept, the benefits and risks they associate with it, and their thoughts on how metaverse will shape the present and the future. The data was collected through interviews with bachelor's students as part of a technology innovation course, including a metaverse experiment. Thematic analysis shows young people emphasize social aspects, including interaction and connection with real people. They see metaverse impacting the future of work and discuss education and learning alongside leisure activities. The biggest concerns revolve around information security and safety. We highlight the importance of educational and academic discussions around the limitations and possibilities of metaverse and the importance of inviting the young generation into such discussions.

Keywords: Metaverse, young people, virtual reality

1. Introduction

Metaverse is entering our work and leisure time with increasing speed – it is among emerging technologies contributing to the digital transformation of our society, businesses and everyday

life, when digital technologies and their associated practices evolve in time [53]. However, we need to recognize, in addition to the metaverse possibilities, the current limitations [32], [40], [45], with the ultimate direction remaining uncertain [5], [9]. Metaverse is also a complex concept with multiple definitions, and the concept is still evolving as different actors and disciplines shape its development [23].

Information Systems (IS) research has already recognized the significance of metaverse with increasing attention [27], [35]. IS studies have pointed out the current confusion with the concept with various definitions [6], [55] and outlined strategic and business implications [19], [27], [30] but also a number of ethical, diversity, equity and inclusion challenges, concerning for example privacy, discrimination, accessibility, and human autonomy [12], [30], [47], [58]. IS researchers have emphasized the prominent role metaverse will play in our digital future. Wang and colleagues [55] introduce the notion of everyday metaverse, underscoring the need to move from "viewing the Metaverse as a distinct digital world to seeing the Metaverse as an integral part of everyday life".

Along these lines, this exploratory study invites the young generation to share their views and understandings of metaverse. It is expected that their future everyday life will be intimately intertwined with metaverse, as well as with many other emerging technologies, for which reason it is critical to invite them to voice their hopes but also their concerns regarding such a future. Having grown up in an increasingly digitalized world, immersed in technology from an early age, they are attuned to technology in a manner different to the previous generations [39]. The young generation may contribute bold and innovative ideas for the development of future technologies (e.g., [14]), and they have already been actively engaged in envisioning digital futures and advancements in digital technology, addressing topics such as intimate partner cyber harassment [31] and cyberbullying [46], [52]. However, a lot is to be done in terms of inviting the young generation into discussions on our digital futures. They are the ones who will be living with the consequences of decisions made today, due to which their involvement is critical. IS research should be spearheading discussions on our (desirable) digital futures [44] and our study takes a step towards that direction by bringing in voices from the young generation.

We explore how metaverse is perceived by young people, after participating in an experiment using VRChat within their higher education technology innovation course. The implications of metaverse in education have already raised a lot of attention, also in IS research [26], [30], [50]. Although there is already some research on metaverse users and their views on the potential and usages of metaverse in different contexts (e.g., healthcare, sports, work), the literature remains limited. Only one study was found addressing the users' perspective in education [50]. IS research generally lacks insights from the young generation regarding the on-going digital transformation of society and everyday life, including the implications of metaverse for education and life. We address the following research questions: RQ1: How do young people understand metaverse? RQ2: How do young people make sense of metaverse in their everyday life and in the future?

2.   Theoretical background

In 1993, the novel Snow Crash introduced the term metaverse as a vast virtual environment coexisting with the physical world [16], [48]. Over the past 30-plus years, its prominence has grown [7], and its definition has broadened to include ideas such as lifelogging [4], collective virtual spaces [23], and a digital realm where avatars globally connect to work, shop, learn, pursue hobbies, and socialize [2]. Nonetheless, the term continues to promise a persistent, immersive, three-dimensional online world [24], [41].

2.1.   Conceptualizing Metaverse

Metaverse is not yet an established phenomenon, and its definitions constantly change [23]. Theories suggest that metaverse and its development should be viewed critically, ensuring that this kind of sociotechnical system [27] aligns with human-oriented values rather than merely serving financial or individual interests [6]. Metaverse's development is an ongoing, multidimensional process influenced by various actors [6], [42]. Metaverse is seen as the next stage of internet development [24], [57], enhancing previous forms of

digital interaction, such as websites, 3D games, social media, and mobile internet [54]. It does not replace existing technologies but rather integrates and extends them in innovative ways [23], [56]. It is an immersive and interactive 3D world that is constantly evolving [23], [56, 57]. Metaverse is not limited to physical space; it seamlessly connects the real and digital worlds [57]. It exists continuously and operates in real-time [24]. According to Weinberger [57], metaverse adds an immersive digital layer on the real world.

Metaverse enables users to interact socially through avatars [57] and serves as a platform for digital communities. It can be used for communication, work, play, and virtual commerce. Additionally, content can be created and shared in a user-centric manner [54]. By merging virtual reality (VR) with the physical world, metaverse provides users with entirely new transforming experiences [57]. This transformative nature of metaverse not only influences people's behavior but also alters their perception of reality [42], [57].

This study approaches this conceptualization from the perspective of young people, and in particular how young people view this system, which has technical components but also major social, organizational, business, political, and ethical implications [6], [27]. The study relies on Wang and colleagues' [55] idea of the everyday metaverse. They emphasize an experiential view of computing, the blurring of boundaries and seamless transitions between the digital and physical worlds, and narratives of embodied and lived experiences.

2.2. Metaverse Benefits and Risks

The benefits and drawbacks of metaverse have been examined from various perspectives. Social benefits are generally seen as significant in metaverse. Virtual worlds provide opportunities for interaction and community [40]. Metaverse strengthens users' social presence through avatar-mediated encounters [38]. Such environments nurture supportive connections that can ease loneliness and isolation [38]. Indeed, socialization permeates every aspect of a virtual community, intertwining with other activities [28].

Education is an important domain. Advanced simulations and platforms are already in use [5]. Learners simultaneously develop digital literacy and technical skills [25], [36]. Avatar-based access enables students to connect from anywhere [9]. The immersive and interactive setting increases engagement [9], [25] and quality of education [1].

Metaverse also enables virtual work offices, workspaces and environments, providing employees with ideal work environments [1] Its multi-user features allow, e.g. educators, artists and musicians to collaborate using innovative tools [21], [25]. Metaverse has the potential to revolutionize workflows, enhance efficiency, and reduce operational costs [29]. Banks are exploring avatar-based customer service, while health care studies indicate improvements in personalized diagnosis and treatment [59]. Metaverse also encompasses virtual reality therapy, mental health education, and online support groups [11].

Metaverse offers new solutions for leisure activities, combining entertainment into one platform and a broader space for creativity [1]. Metaverse expands the possibilities for artistic practice to share and develop new ideas [13], [21]. Metaverse also makes acquiring and selling art more accessible. It enables art shops to operate without physical limitations [13]. From a tourism perspective, metaverse offers experiences that are not possible in real life. Monaco & Sacchi [33] write about simulation experiences that allow users to experience goods and services that cannot be experienced in reality. Metaverse removes physical limitations and allows participation for people with mobility impairments or those in remote areas. Monaco and Sacchi [33] also highlight environmental benefits, metaverse reducing carbon emissions by eliminating the need for physical travel.

The social and commercial potential of metaverse has been identified as significant. In the context of smart city governance, metaverse can enhance citizen participation and strengthen the community. Metaverse can enhance the efficiency and decision-making capabilities of smart cities through the utilization of big data and virtual collaboration [28], [45]. Metaverse simulations without risk can aid in traffic testing and emergency training, while real-time hazard enables expedited evacuations during crises [28], [45].

However, the literature also highlights several drawbacks associated with metaverse such as limited access to the required infrastructure and limitations of current devices [33], [45]. They are neither lightweight nor transparent enough, and their high cost hinders

widespread adoption [37]. Metaverse technologies and cloud services demand significant computing power to support growing user base [37]. Moreover, certain level of digital proficiency and literacy is needed to navigate effectively in metaverse platforms [9].

Some drawbacks concerning metaverse mirror those of the internet and social media. For instance, interactions within metaverse often lack the depth and quality of real-world interactions [9], [22], [38]. The ability to present oneself as the "ideal version" rather than the "true self" can result in superficial relationships and confusion about personal identities. Moreover, privacy infringement is a significant concern, as data from non-real-world interactions is collected and processed in real time [22], [51]. When metaverse closely integrates with the real world and reflects real identities, it is crucial to address data privacy protection [28], [37], [45]. Additionally, excessive immersion in virtual relationships can lead to a neglect of real-world connections [37].

While immersion and the high degree of freedom in the metaverse are beneficial [33], they also make users more unpredictable and potentially dangerous compared to existing online services and games. The virtual space and anonymity reduce people's sense of guilt about crimes, raising concerns about new crimes or other ethical problems [22], [33]. Other issues include the dissemination of false information, fraud, unfavorable atmospheres, and infringement of intellectual property rights [37]. The vast amounts of data created and shared by users worldwide cannot be censored individually, potentially turning metaverse into a lawless zone. This poses a significant risk especially to adolescents [22].

2.3. Metaverse Shaping Our Life

Metaverse is reshaping our world and impacting our identities. This could lead to serious transformations, allowing people to have multiple and multidimensional identities [32]. Metaverse shapes education, economy, even our spiritual well-being [8], [17, 18]. It impacts identity and social relationships, as previously demonstrated. The notion of "everyday metaverse" emphasizes that metaverse is not a separate entity but rather an integral part of everyday life [56], within which physical and digital elements merge, allowing people to engage with metaverse for daily activities, work, social interactions, and commerce in the same way they do in the physical world.

The literature indicates metaverse is driving the digital transformation [20], [53] of work, businesses, everyday life and society. It provides immersive and interactive learning experiences that have the potential to transform classroom education [18]. The entertainment industry is thriving in metaverse, where gaming experiences are becoming more diverse and gaining new dimensions. These gaming offerings are also being applied in other application areas [49]. Metaverse is transforming marketing and consumer experiences, leading to changes in business models and practices as consumers interact with products [8], [20]. Digital assets, crypto currencies, and Non-Fungible Tokens (NFTs) are creating a new ecosystem for trading [10]. New, deeper, and connectional aspects emerge in metaverse: rituals, meditation, and spiritual/religious experiences [17]. Virtual spaces allow communities, including churches, mosques, and temples, to conduct religious practices, which broadens the possibilities for spiritual experiences and enhances accessibility. Additionally, metaverse promotes deeper relaxation, a heightened sense of presence, and more profound meditation experiences [17].

3. Methods

This study was an empirical-qualitative interview study concerning youth and metaverse.

3.1. Research Setting and Participants

Participant recruitment was done within the context of a VR experiment for a higher education course Technology Innovation and Business for bachelor's students of Information Systems and Software Engineering at the university of Oulu. Thirty students with varying levels of experience participated in a metaverse experiment in VRChat (Sanrio Puroland Virtual Festival), where they interacted with the environment and other participants, performing predefined tasks. 11 volunteers participated in semi-structured interviews after the experiment. The interviews were done via Teams or in a classroom.

3.2. Data Collection and Analysis

The study employed a semi-structured interview strategy [34], [43]. The questions asked concerned participants' definitions (What is Metaverse?) and understandings (What is your understanding of the concept Metaverse?), further exploring what the metaverse means to them. We inquired about the best aspects of metaverse, the greatest benefits of using metaverse, and how participants would like to use it, also in terms of learning. We also asked about the greatest risks associated with using metaverse. Each interview involved one participant and an interviewer. The interviews lasted about one hour, with the part relevant to this study lasting approximately 30 minutes. All interviews were audio-recorded and transcribed. Researcher triangulation was employed to enhance the reliability of the study. After transcribing the data, and systematic organization of the responses into a table, three researchers coded and analyzed the data question by question, combined concepts and discussed their findings to reach a consensus on the emerging themes, in accordance with the six-step reflective thematic analysis procedure [3]. Given the small sample size, this process helped to minimize individual biases and ensured a more comprehensive analysis. Fourth researcher reviewed and approved the outcomes. Following a meta-level analysis, a separate document was created collaboratively. It identified key themes and categorized responses accordingly. The data analysis process with discussions and insights integrated both inductive analysis and theory driven analysis, allowing for a dialogue between empirical material and existing literature. The data analysis process overall entailed identification and validation of three over-arching themes emerging from the data: conceptualization of metaverse, benefits and risks of metaverse and impacts of metaverse shaping our lives and futures.

4. Results

This section presents the key findings of the study, based on the analysis of eleven interviews of bachelor's students within a technology innovation course, carried out after a metaverse experiment. The data analysis led to the identification of the following themes: definitions of metaverse, benefits and risks of metaverse and impacts of metaverse shaping our lives and future, which are discussed in the following four sections.

4.1. What is Metaverse?

When reviewing the responses concerning metaverse definitions, four distinct categories of definitions can be identified: general definitions, technological perspectives, individual and social perspectives, and characteristics and uses of metaverse. Additionally, some interviewees express that defining the metaverse can be challenging. One participant noted, "*I can't define it precisely,*" (p4) while another admitted, *"I actually had to Google it because I wasn't sure about the exact definition*" (p7). General definitions include participants' clear, concise explanations of metaverse, linking it with VR or Extended Reality (XR): "*Maybe I would just call it virtual reality,*" (p13) or "*Just like virtual reality, there's extended reality.*" (p6) Many responses also reflect on the relationship between these concepts and real life: *"I know it's like a new world or a new reality,"* and *"It imitates real life more than something else."* (p8) Virtuality is the thing in some answers, which define metaverse as *"A virtual pseudo-reality with other people."* (p5) or "*All virtual reality-related things in general.*" (p4) The definitions highlight the possibilities and distinctions of this new existence, stating that it allows us *"to live our reality in a new world that is different from our physical one."* (p10)

The interviews also reveal a technological perspective on metaverse, with some respondents describing it as akin to Web3. There are mentions of Facebook's experiments with the concept of Meta, raising questions like, *"Didn't Facebook's virtual reality experiment fail to gain traction?"* (p11) Some interviewees describe metaverse as environments they actively engage with, such as VRChat or RecRoom. Additionally, they compare those experiences when defining the metaverse, suggesting that there may be a *"deeper level of connectivity in the metaverse compared to earlier platforms like Habbo Hotel, traditional chat rooms, or IRC"* (p5). The social perspective is highlighted as a key part of metaverse definitions. Metaverse is discussed as a social place and possibility *"A social platform where, in a way, the mobility of this world remains"* (p5) *"These kinds of*

social platforms, I guess they would all be grouped under the metaverse concept" (p6)*.* The presence of other people is considered important: *"Social games where you interact with people."* (p5) Sociality is often associated with avatars that individuals control: *"There are other people there, and you can choose whether to interact with them or not."* (p8)*, "Or actually, they are not people but avatars that people control"* (p8).

The definitions also encompass the characteristics and uses of metaverse. In its simplest form, the interviewees indicated that metaverse is a space for meeting and conversation. More broadly, some described it as "*a virtual world where we can do everything."* (p3) Metaverse is viewed as a place that one can access with specific tools, allowing users to immerse themselves and navigate freely:*"A place where with some aids, you can immerse yourself and move...similar to real life*". (p10) It also serves as a platform for incorporating various types of content and offers opportunities for conducting business, creating spaces for others to utilize (p9). Additionally, its influence extends to challenging the boundaries of nature. This idea of "*breaking the boundaries of nature*" (p10) suggests that we are capable of creating a reality we desire within our physical and infrastructural development. This imaginative potential allows us to manifest our visions in reality, even if they cannot be physically touched. "*Also create and bring out imaginations to reality, even though we cannot touch it"* (p10).

4.2.   Metaverse Benefits and Risks

According to the interviewees, sociality is a key element of metaverse and, therefore, one of the biggest benefits. People can share ideas and build relationships with people living in different parts of the world. Networks can be diverse. "*We could talk to self, family or friends from another part of the world*" (p3). As interviewees beautifully summarizes, *"virtual interaction can expand or deepen connections"* (p5) and "*strengthen the sense of presence despite distance"* (p6). The experience can expand even further when technology enables more diverse ways of interacting. "*I guess it's really cool, that VR*" (p1).

After sociality, freedom emerges as the second element that is considered a benefit of metaverse. For many, this new dimension appears as limitless possibilities: *"You can have whatever experience you want to have"* (p2) or you can add almost anything to metaverse, add *"anything and everything"* (p3). In addition to freedom, metaverse is seen as a place where one can control actions and decide with whom one interacts: "*In the metaverse, you… kind of control your own environment, and you obviously can block users*." (p7) It also enables access to places that would normally be inaccessible or "*not accessible to them*" (p7). In terms of accessibility, metaverse can offer new opportunities for people. Technology can be used to create new worlds not only for us but also for *"welfare for those we love"* (p10). In those worlds, people can experience things without physical limitations. In particular, one can facilitate activities for those who are unable to act in the real world, who are *"unable to do things"* (p7). In the virtual world, both the environment and one's own appearance can be modified: "*In the virtual world…you can look whatever you want. You can adjust your own appearance."* (p13) Metaverse also acts as an easy storage place that can be modified and managed according to one's own needs (p8).

As a technology, metaverse offers new interesting opportunities in many application areas. In medicine and surgery, its application can facilitate learning and training, improve nursing work and enable remote consultations. "*There are some applications made for doctors or surgeons that allow them to practice"* (p4). Learning and teaching are seen as a particular benefits. In general, in terms of education, virtual teachers, virtual lectures, simulations, flexible spaces, and large-scale learning environments are seen by interviewees as possibilities in the new learning environment of the future. The possibility of moving back into history is also offered, and one answer also considers the possibility of recreating history. "*The first thing that comes to my mind is to recreate the, like, historical events*" (p3). The same respondent considers looking at and learning about paintings in VR and states that it is a good experience based on his own experience: "*And that could be a great learning experience"* (p3). According to interviewees, especially in leisure time, gaming is a significant benefit. When talking about leisure time, the

possibilities of metaverse for making art also come to the fore. Painting and creating in a virtual environment do not cause a mess in the physical space *"...then it doesn't seem like it will cause any mess here (in the real environment) ... and all that"* (p8). From a sustainability perspective, there are also benefits in reducing the need to travel, when people can meet in metaverse without having to physically move. In general, "*Well, I think if it can be utilized to the point where that sense of immersion is used in teaching somehow, then I could see that it could be useful."* (p9) Overall, metaverse is seen to offer a lot of possibilities: "*So it's a bit the same in that it can give a kind of dimension to what is not normally possible. But the thing is, is it really...is it possible to use so many resources for it in practice at the moment?*" (p9)

Information security is one of the biggest concerns. Data leaks and possible manipulation are risks that metaverse users fear (p6), according to the interviewees. Because people can remain anonymous, it is easier to act inappropriately or manipulate others. Controlling copyright and ensuring fair use are also challenges in virtual worlds. In addition to anonymity, concerns are also related to the weakening of natural human contacts. Some argue that metaverse can alienate people from real social connections and even cause addiction *"It may start to detach people from having natural and normal human connections"* (p10). This can negatively affect mental well-being and social skills and according to one interviewee even *"turn people to zombies"* (p10). Governance and moderation of metaverse are key issues. Lack of supervision can increase risky situations, especially for children (p7) who may be exposed to harmful content or dangerous contacts. *"There is probably part of content… generated through VR that is inappropriate."* (p10)

4.3.   Metaverse Shaping Our Life

When considering how metaverse shapes their own and everyday lives around them, as well as at a societal level, some state this experiment is their first experience, so when interviewed, some have difficulties in answering (p7) or mention they have no experience or interest in designing or sharing work with a group (p7). Some express their personal approach and disinterest, such as *"I wouldn't be the one designing worlds or doing like avatars"* (p7). However, most of the 11 interviewees consider interesting perspectives based on their own experience and throw themselves into thinking about metaverse shaping our lives and future, discussing topics such as work, education, leisure and sociality.

Some of the interviewees approach the issue from the work perspective and bring up facilitation of computer work: *"Well, yes, I see that it will be shaping partly, just through my own future work"* (p5). They see metaverse shaping future work, one of them in the context of software development, another from the perspective of coding, a third wonders whether meetings will be held in metaverse in the future, which sounds uncomfortable to him. *"I don't know, and I'll have to go to some meetings in the metaverse in the future; that would sound pretty uncomfortable,"* (p1). Another interviewee (p6) experiences meetings as an opportunity to interact with other people, to move around. He also brings up the *"chalkboard"* and the novel possibilities of a traditional classroom. In the opinion of the interviewees (p1, p11), metaverse should be such a tool for work that it wouldn't take up an unreasonable amount of time and energy and would be easy to use.

In addition to changes in working life, opportunities in education emerge. In metaverse, you can teach things you can't necessarily do in real life. *"In this context, I think about teaching all the time, but on the other hand, it's a pretty big deal."*(p4) In school life, the adaptability of metaverse comes to the fore: *"I could use materials to like, attend classes and do some of the school work,"* (p2) Multitasking becomes easier when you can work on multiple screens at the same time (p6) and also communicate with people, who are far away in real life. (p7) According to the interviewees, metaverse can also be used to attend classes, do schoolwork, or participate in meetings. *"I feel it's something that is created…to aid…our learning"* (p2). The possibilities offered by simulation also emerge when considering how metaverse is shaping our lives. In metaverse, even a small object can be further broken down into parts or enlarged (p5). It is easy for people to understand how an

object works in a metaverse environment. According to one interviewee (p9), in twenty years, there could be various metaverse solutions if metaverse spreads to the mass market like phones did earlier this century. According to him, there are many kinds of immersive solutions for education as well as for business.

As for everyday life, metaverse makes young people think. According to them, metaverse could improve concentration and increase productivity. "*Well, that will help boost my productivity, yes.*" (p2) One of the interviewees reflects on absence of headsets in his own life but plans to explore metaverse in the future. Everyday thoughts about metaverse also direct thoughts towards detachment from everyday life and relaxation: "*Well, just detachment from that moment of ordinary life if you can for a moment… calming down for a moment, even if you know that you have a lot of household chores or work to do… you can go somewhere for even 10 or 15 minutes*" (p6). According to most participants, metaverse is not yet a part of their daily lives, despite being a significant part of entertainment and leisure. Some view metaverse purely as a leisure activity (p4).

In the context of everyday life, sociality raises questions about physical connection and its existence in the metaverse. Connection is seen to be very important. It is also seen to be easier and more comfortable when compared to sitting in a traditional conference room. In metaverse, you can walk around, talk and do everything else (p3) or as another interviewee says, you can change the way you interact. The discussion points out that people can see each other "*You see me, I see you*", (p2) but questions concerning connection between people arise: Will it feel like the same? Is there a physical connection? Will it exist? (p2). Questions about the existence of metaverse are raising in young people's minds. Metaverse can become the center of social media, and discussions are held around it. At the same time, young people are concerned about equality and taking care that everyone can participate and join. A question also arises about sustainability of metaverse and how metaverse could reduce its carbon footprint (p10).

5. Discussion

This exploratory study combined insights from literature and the young generation. Based on small but valuable data gathered, our study indicates that metaverse is perceived as a constantly evolving, immersive, and social 3D entity—a world that is still under development. Our study shows that the views of the young interviewees align surprisingly closely and beautifully with prior studies [23], [57]. As regards RQ1 (How do young people understand metaverse), we show the interviewees, in a similar manner to the studies, consider metaverse to be similar to Web3, representing the next stage in the evolution of the internet (cf. [24], [57]). They present clear and concise explanations for VR and XR when conceptualizing metaverse and discuss deeper levels of connectivity compared to earlier platforms. They point out that metaverse combines multiple technologies (cf. [24], [54]) and blurs the lines between the physical and virtual worlds (cf. [55]).

As for RQ2 (How young people make sense of metaverse in their everyday life and in the future), when considering the benefits and drawbacks of metaverse, three domains emerge: education, health, and the arts, which also encompass leisure activities. Education is the most prominent in the answers. According these young interviewees, the possibilities for metaverse in education are following theories, continually evolving, and involving various advanced technical tools, applications, and simulations (cf. [5]). While the interviewees did not explicitly mention digital literacy, their discussions reflect the importance of acquiring skills and managing new technologies that develop alongside metaverse (cf. [36]), thereby improving the quality of education (cf. [1]).

The aspects of socialization and social interaction are emphasized in the interviewees' responses as well as in the existing literature. Avatars play a significant role in facilitating connections among users from different parts of the world (cf. [9], [38]). Additionally, interactivity (cf. [9], [25]), and community (cf. [40]) are highlighted within the context of social engagement. Beyond education, metaverse provides a platform for young people to access various types of content, as well as opportunities for work and business in a virtual environment (cf. [54]). According to the young interviewees, it offers multi-user environments and innovative tools across multiple fields. The interviewees also underscore

the potential of art within the metaverse (cf. [13], [21]). However, when assessing the benefits, a key consideration is the metaverse's potential, its developmental trajectory, and questions related to revolutionizing workflows and improving efficiency (cf. [29]).

As in the literature, the disadvantages of the metaverse highlight security, governance, control, and social harm (cf. [28], [37], [45]), although its sociability is often regarded as one of its most significant positive aspects (cf. [38], [40]). In the thoughts of the young interviewees, among the disadvantages, security is particularly concerning, as it involves risks like data leaks and manipulation (cf. [22], [32], [51]). The literature supports young people's views on the importance of governance and moderation within the metaverse [cf. 28, 45], emphasizing the dangers that arise from a lack of control (cf. [36]). Additionally, the young people express worries about social interaction and mental health (cf. [11], [40]), noting how the metaverse may impact natural human connections and potentially weaken relationships (cf. [38], [40]), leading to feelings of alienation from real-life social interactions (cf. [22]). The young generation also identifies issues related to accessibility, equality and sustainability, in line with existing theories (cf. [9], [33], [37], [45]) engaging in important discussion on ethical and societal implications of emerging technologies.

When concerning metaverse shaping future, the results again show that the young people's ideas about metaverse are compatible with existing studies, except for marketing and consumer experiences (cf. [8], [20]). These interviewees also did not mention digital assets, crypto currencies or NFT creating ecosystems for trading (cf. [10]). In addition to freedom, young people discuss significant issues relating to social interaction and communities (cf. [8], [17, 18]). Possible changes in education (cf. [18]), and working life are highlighted, multitasking and simulation opportunities as great examples. Furthermore, metaverse is perceived as an integral part of daily life (cf. [56]), extending beyond education and work to influence leisure activities and offer a means of detachment and relaxation from everyday routines (cf. [17]). Perhaps the short experiment and lack of experience in the use of metaverse left some young people feeling disconnected and not considering what the use of metaverse might mean, for example, in the longer term and how it could shape our personal identity (cf. [32]).

Our study contributes to IS research by offering the voices of young people to the discussions of metaverse futures. We show some youth may had limited understanding of metaverse while many were capable of pointing out a variety of ethical and societal implications of metaverse, for now and for the future, addressing the future of work, leisure, education and everyday life. Their views align surprisingly well with IS research on the topic [12], [30], [47], [58]. Although our sample size limits the generalizability of our findings, valuable insights were gained on their hopes and fears regarding the metaverse futures. More discussions on digital futures have been called for in IS research [44], and our study responds to this call. We gained young people's views on the future of work – a prominent theme in IS research [15]: they considered (preferred and unpreferred) ways by which metaverse may shape the domains of health, education, and arts, as well as the work practices of (computing) professionals. In the future, IS research should invite broader participation into these discussions – including children and youth among other participants [14]. Our study also provides some glimpses into how young people approach the everyday metaverse [55], as intimately intermingled with their everyday life and practices. However, we see the study's limited timeframe delimiting young people's reflection and imaginaries on the everyday metaverse. We also acknowledge there are more sophisticated methods for probing and exploring our digital futures and associated experiential and ethical aspects, e.g., under the labels of speculative design and design fiction [46]. In the future, such methods should be utilized when exploring everyday metaverse futures. Perceptions of the metaverse inevitably appear limited and somewhat vague, and the concept in general is still in its formative stages. To better understand this continuously transforming technology, regular follow-up studies using both qualitative and quantitative methods are necessary, employing diverse approaches and participant groups, voicing their hopes and fears. Future studies are welcome to explore how the participants' background, knowledge, and individual characteristics shape their views, imaginaries, and perceived benefits and risks. Our study provides valuable input for metaverse designers

and developers: they should pay careful attention to the needs and wishes of the young generation, who represent the future user population. Our study paves the way for more participatory and future design approaches in metaverse development.

References

1. Aljumaie, M., Chi Nguyen, H., Chu, N.H., Nguyen, C.T., Nguyen, D.N., Thai Hoang, D., Dutkiewicz, E.: Potential applications and benefits of metaverse. Metaverse communication and computing networks: Applications. (2023)
2. Bobrowsky, M., Needleman, S.E.: What Is the Metaverse? The Future Vision for the Internet, *WSJ*, https://www.wsj.com/story/what-is-the-metaverse-the-future-vision-for-the-internet-ca97bd98, Accessed: April 09, 2025, (2022)
3. Braun, V., Clarke, V.: Thematic analysis. In: Encyclopedia of quality of life and well-being research. pp. 7187–7193. Springer (2024)
4. Bruun, A., Stentoft, M.L.: Lifelogging in the Wild: Participant Experiences of Using Lifelogging as a Research Tool. In: Lamas, D., Loizides, F., Nacke, L., Petrie, H., Winckler, M., and Zaphiris, P. (eds.) Human-Computer Interaction – INTERACT 2019. pp. 431–451. Springer International Publishing, Cham (2019)
5. Buchwald, P.: Benefits of Using the Metaverse Environment and Virtual Reality in Simulating the Evacuation of People from Buildings. Safety & Fire Technology. 63 (2024)
6. Dolata, M., Schwabe, G.: What is the Metaverse and who seeks to define it? Mapping the site of social construction. Journal of Information Technology. 38 (3), 239–266 (2023)
7. Duan, H., Li, J., Fan, S., Lin, Z., Wu, X., Cai, W.: Metaverse for Social Good: A University Campus Prototype. In: Proceedings of the 29th ACM International Conference on Multimedia. pp. 153–161. Association for Computing Machinery, New York, NY, USA (2021)
8. Dwivedi, Y.K., Hughes, L., Wang, Y., Alalwan, A.A., Ahn, S.J., Balakrishnan, J., Wirtz, J.: Metaverse marketing: How the metaverse will shape the future of consumer research and practice. Psychology & Marketing. 40 (4), 750–776 (2023)
9. Flores-Castañeda, R.O., Olaya-Cotera, S., Iparraguirre-Villanueva, O.: Benefits of metaverse application in education: A systematic review, (2023)
10. George, A.H., Fernando, M., George, A.S., Baskar, T., Pandey, D.: Metaverse: The next stage of human culture and the internet. International Journal of Advanced Research Trends in Engineering and Technology (IJARTET. 8 (12), 1–10 (2021)
11. Govindankutty, S., Gopalan, S.P.: The Metaverse and Mental Well-Being: Potential Benefits and Challenges intheCurrent Era. In: The Metaverse for the Healthcare Industry. pp. 131–152. Springer Nature Switzerland, Cham (2024)
12. Han, S., Shi, Z.: Unmasking inequality in the metaverse: a study of skin-tone bias in the cryptopunks market. In: Proc. HICSS. (2024)
13. Hurst, W., Spyrou, O., Tekinerdogan, B., Krampe, C.: Digital art and the metaverse: benefits and challenges. Future Internet. 15 (6), 188 (2023)
14. Iivari, N., Molin-Juustila, T., Kinnula, M.: The future digital innovators: empowering the young generation with digital fabrication and making. In: Proc. ICIS. (2016)
15. Jain, H., Padmanabhan, B., Pavlou, P.A., Raghu, T.S.: Editorial for the Special Section on Humans, Algorithms, and Augmented Intelligence: The Future of Work, Organizations, and Society. Information Systems Research. 32 (3), 675–687 (2021)
16. Joshua, J.: Information Bodies: Computational Anxiety in Neal Stephenson's Snow Crash. Interdisciplinary Literary Studies. 19 (1), 17–47 (2017)
17. Kosunen, I., Salminen, M., Järvelä, S., Ruonala, A., Ravaja, N., Jacucci, G.: RelaWorld: Neuroadaptive and Immersive Virtual Reality Meditation System. In: Proceedings of the 21st International Conference on Intelligent User Interfaces. pp. 208–217. Association for Computing Machinery, New York, NY, USA (2016)
18. Kovaitė, K., Butvilas, T., Šūmakaris, P.: Shaping the future of learning: Policy strategies for blended education and the role of metaverse, (2024)

19. Krüger, K., Weking, J., Fielt, E., Böttcher, T., Kowalkiewicz, M., Krcmar, H.: Value drivers for Metaverse business models: A complementor perspective. Journal of Management Information Systems. 42 (1), 143–173 (2025)
20. Kshetri, N.: Web 3.0 and the metaverse shaping organizations' brand and product strategies. IT professional. 24 (02), 11–15 (2022)
21. Kwon, H.J.: Designing Metaverse space for sound and vision: The benefits of co-creation frameworks for multiuser communication environment. In: 한국 HCI 학회: 학술대회논문집. pp. 1095–1100. (2009)
22. Kye, B., Han, N., Kim, E., Park, Y., Jo, S.: Educational applications of metaverse: possibilities and limitations. J Educ Eval Health Prof. 18 32 (2021)
23. Lee, L.-H., Bermejo, C., Hui, P.: The Metaverse with Life and Everything: An Overview of Privacy, Ethics, and Governance*. In: Metaverse Communication and Computing Networks. pp. 293–310. John Wiley & Sons, Ltd (2023)
24. Lee, L.-H., Braud, T., Zhou, P.Y., Wang, L., Xu, D., Lin, Z., Kumar, A., Bermejo, C., Hui, P.: All One Needs to Know about Metaverse: A Complete Survey on Technological Singularity, Virtual Ecosystem, and Research Agenda. HCI. 18 (2–3), 100–337 (2024)
25. Liang, J., Li, G., Zhang, F., Fan, D., Luo, H.: Benefits and challenges of the educational metaverse: Evidence from quantitative and qualitative data. Journal of Educational Technology Development and Exchange (JETDE. 16 (1), 71–91 (2023)
26. Liu, D., Huang, R., Metwally, A.H.S., Tlili, A., Lin, E.F.: Application of the Metaverse in Education. Springer (2024)
27. Lowry, P.B., Boh, W.F., Petter, S., Leimeister, J.M., Guest: Long Live the Metaverse: Identifying the Potential for Market Disruption and Future Research. Journal of Management Information Systems. 42 (1), 3–38 (2025)
28. Maier, F., Weinberger, M.: Metaverse meets smart cities—applications, benefits, and challenges. Future Internet. 16 (4), 126 (2024)
29. Maksimović, M., Bošković, M.Č., Šekara, T.B., Lutovac, B.: Exploring the energy metaverse: Potential benefits and challenges. In: 2023 12th Mediterranean Conference on Embedded Computing (MECO. pp. 1–4. (2023)
30. Marabelli, M., Newell, S.: Responsibly strategizing with the metaverse: Business implications and DEI opportunities and challenges. The Journal of Strategic Information Systems. 32 (2), 101774 (2023)
31. Melander, L.A.: College Students' Perceptions of Intimate Partner Cyber Harassment. Cyberpsychology, Behavior, and Social Networking. 13 (3), 263–268 (2010)
32. Mitrushchenkova, A.N.: Personal Identity in the Metaverse: Challenges and Risks. Kutafin Law Review. 9 (4), 793–817 (2022)
33. Monaco, S., Sacchi, G.: Travelling the metaverse: Potential benefits and main challenges for tourism sectors and research applications. Sustainability. 15 (4), 3348 (2023)
34. Myers, M.D., Newman, M.: The qualitative interview in IS research: Examining the craft. Information and Organization. 17 (1), 2–26 (2007)
35. Nah, F.F.H., Vreede, G.J., Goel, L., Lim, E., Schiller, S., Tan, C.W.: Editorial for the Special Issue of the Metaverse. AIS Transactions on Human-Computer Interaction. 16 (4), 388–395 (2024)
36. Nguyen, H.T., Ngo, Q.D.: Benefits and Challenges of Metaverse in Education. In: International Conference on IoT Based Control Networks and Intelligent Systems. pp. 745–756. Springer Nature Singapore, Singapore (2023)
37. Ning, H., Wang, H., Lin, Y., Wang, W., Dhelim, S., Farha, F., Ding, J., Daneshmand, M.: A Survey on Metaverse: the State-of-the-art, Technologies, Applications, and Challenges.
38. Oh, H.J., Kim, J., Chang, J.J., Park, N., Lee, S.: Social benefits of living in the metaverse: The relationships among social presence, supportive interaction, social self-efficacy, and feelings of loneliness. Computers in Human Behavior. 139 107498 (2023)

39. Palaiologou, I.: Children under five and digital technologies: implications for early years pedagogy†. European Early Childhood Education Research Journal. 24 (1), 5–24 (2016)

40. Paquin, V., Ferrari, M., Sekhon, H., Rej, S.: Time to think "meta": a critical viewpoint on the risks and benefits of virtual worlds for mental health. JMIR Serious Games. 11 43388 (2023)

41. Ritterbusch, G.D., Teichmann, M.R.: Defining the Metaverse: A Systematic Literature Review. IEEE Access. 11 12368–12377 (2023)

42. Riva, G., Wiederhold, B.K.: What the metaverse is (really) and why we need to know about it. Cyberpsychology, behavior, and social networking. 25 (6), 355–359 (2022)

43. Robson, C., McCartan, K.: Real world research. Blackwell Oxford (2002)

44. Schlagwein, D., Currie, W., Leimeister, J.M., Willcocks, L.: Digital futures: Definition (what), importance (why) and methods (how). Journal of Information Technology. 40 (1), 2–8 (2025)

45. Sharifi, A., Amirzadeh, M., Khavarian-Garmsir, A.R.: The metaverse as a future form of smart cities: A systematic literature review of co-benefits and trade-offs for sustainable development goals. Cities. 161 105879 (2025)

46. Sharma, S., Hartikainen, H., Ventä-Olkkonen, L., Eden, G., Iivari, N., Kinnunen, E., Arana, R.F.: In pursuit of inclusive and diverse digital futures: exploring the potential of design fiction in education of children. In: Interaction Design and Architecture (s. pp. 219–248. (2022)

47. Smith, C.H., Molka-Danielsen, J., Rasool, J., Webb-Benjamin, J.-B.: The World as an Interface: Exploring the Ethical Challenges of the Emerging Metaverse. Hawaii International Conference on System Sciences 2023 (HICSS-56). (2023)

48. Stephenson, N.: Snow Crash. Bantam Books (1993)

49. Swami, P.: Metaverse: Transforming the User Experience in the Gaming and Entertainment Industry. In: Research, Innovation, and Industry Impacts of the Metaverse. pp. 115–128. IGI Global Scientific Publishing (2024)

50. Tripathi, A., Bernsteiner, R., Ploder, C., Khazanchi, D.: Metaverse Technologies for Collaborative Learning: Insights from a Pilot Study in Meta's Horizon Workroom. In: Proc. AMCIS. (2024)

51. Trivedi, S., Negi, S.: The metaverse in supply chain management: application and benefits. International Journal of Advanced Virtual Reality. 1 (1), 36–43 (2023)

52. Vandebosch, H., Van Cleemput, K.: Defining Cyberbullying: A Qualitative Research into the Perceptions of Youngsters. CyberPsychology & Behavior. 11 (4), 499–503 (2008)

53. Väyrynen, K., Lanamäki, A., Laari-Salmela, S., Iivari, N., Kinnula, M.: Unpacking the Regulatory Ambiguity Mechanism: Implications for Industry-Level Digital Transformation. Information Systems Journal. n/a (n/a), (2025)

54. Venugopal, J.P., Subramanian, A.A.V., Peatchimuthu, J.: The realm of metaverse: A survey. Computer Animation & Virtual. 34 (5), e2150 (2023)

55. Wang, G., Zhang, Z., Nandhakumar, J., Manoharan, N.: Everyday Metaverse: The Metaverse as an integral part of everyday life. Journal of Management Information Systems. 42 (1), 310–342 (2025)

56. Wang, Y.: Every Day Matters: Using Daily Methods to Understand Oppression and BIPOC Youth Development in Context. Journal of Research on Adolescence. 32 (2), 666–672 (2022)

57. Weinberger, M.: What Is Metaverse?—A Definition Based on Qualitative Meta-Synthesis. Future Internet. 14 (11), 310 (2022)

58. Xie, R., Kirchner-Krath, J., Morschheuser, B.: Towards an Ethical Metaverse: A Systematic Literature Review on Privacy Challenges. ECIS 2024 Proceedings. (2024)

59. Żydowicz, W.M., Skokowski, J., Marano, L., Polom, K.: Navigating the Metaverse: A New Virtual Tool with Promising Real Benefits for Breast Cancer Patients. Journal of Clinical Medicine. 13 (15), 4337 (2024)