**The metaverse strikes back! - A children's rights perspective on virtual worlds and generative artificial intelligence**

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*Summary*

The article examines possible opportunities and risks of virtual worlds and generative artificial intelligence in relation to children's rights under the UN Convention on the Rights of the Child and recommends the legal concept of personal integrity as a basis for the well-being of (young) users in the metaverse.

## 1 Life in the metaverse

With the availability of generative artificial intelligence (AI) and the creation of virtual worlds, the immersion of digital media in everyday life has reached a new level of development. The concept of 'virtual reality' dates back to 1989, which makes it just as old as the World Wide Web and the United Nations Convention on the Rights of the Child. It was coined by Jaron Lanier, a pioneer and developer of digital technologies who was involved in the early invention of avatars and interactive applications. Later, he began to criticise the functioning of social networks, and in his book "Dawn of the New Everything: Encounters with Reality and Virtual Reality", published in 2018, he addresses the contradictory nature of the concept and the social changes that can be expected as a result of virtual reality. Another widely adopted concept of VR now using the term metaverse was presented by Matthew Ball in 2020. According to him, the metaverse will lead to the (further) merging of physical and digital worlds, private and public contacts and relationships. In this environment, (digital) value will be created by both individuals and businesses, data and virtual objects will be deployable across different services, and a wide range of content, experiences and opportunities will be made available (Ball, 2020). In addition to these more tangible features, Ball also describes the characteristics of the metaverse in terms of the perceptions and feelings by its habitants. In his assumption the metaverse would be an 'experience that spans both the digital and physical worlds, private and public networks/experiences, and open and closed platforms' (Ball, 2020).

In their preparation of the market environment for virtual worlds and artificial intelligence (EC, 2024), the European Commission, like Ball, assumes that the metaverse will exist continuously and in real time, accessible from anywhere and to anyone. While the Commission's initial focus is on the economic potential of the metaverse, it is becoming increasingly clear that virtual environments and artificial intelligence offer a wide range of possibilities and opportunities for society, but the risks and dangers associated with these technologies should not be underestimated.

## 2 Children's rights and personal integrity in the metaverse

The Convention on the Rights of the Child, adopted by the United Nations General Assembly in 1989, guarantees the rights of minors to protection, provision and participation. With General Comment No. 25, the United Nations Committee on the Rights of the Child 2021 provided essential information and explanations on how these rights can be realised in the digital environment and how children's rights to protection, provision and participation can be balanced (Krause, 2021). References and provisions to children's rights are also increasingly to be found in national, regional and international policies and regulations for the digital environment or are being discussed in the context of reform processes. Even if this does not yet ensure that children's rights are implemented in every programme or service, it is clear that supranational and state actors are increasingly aware of their responsibilities and willing to hold providers accountable (Krause, 2024).

With the Amendment of the Youth Protection Act in 2021, the German federal legislator has enshrined the personal integrity of children and young people as a new protection objective. The concept does not come with a definition and a generally applicable legal understanding has yet to be developed. A proposal by the Expert Group on Children's Rights in the Digital World organised at the German Children's Fund (Deutsches Kinderhilfswerk e.V.) suggests that personal integrity includes the protection of physical and psychological integrity as well as personal data. In particular, an age-appropriate and future-oriented development as well as the informational and sexual self-determination of minors should be guaranteed (Krause et al., 2022).

## 3 Participation in the metaverse

Even if basic technologies such as virtual reality glasses, which open the path to three-dimensional virtual worlds, have hardly been used in Germany to date (Game, 2024), it is known from research on virtual worlds that children show great interest in using such a digital environment (Felnhofer, 2024), and it can be assumed that children, as digital natives, will be among the first to explore, try out and occupy virtual worlds (early adopters). Based on the testimonies of young people who participated in drafting General Comment No. 25 (5Rights Foundation, 2021) on the rights of children in the digital environment, the United Nations Committee on the Rights of the Child states that States Parties have an obligation to provide all children with effective and meaningful access to the digital environment (para. 9f GC 25) in order to prevent discrimination against young people in their opportunities to participate.

Virtual worlds and artificial intelligence will offer many opportunities and possibilities for children's rights to education (para. 99ff GC 25), access to information (para. 50ff GC 25) and leisure (para. 106ff GC 25). The comprehensibility of complex processes through immersive educational programmes and experiences can help to promote the acquisition of knowledge and thus have a positive effect both individually and socially. Information that is particularly important in adolescent development phases such as puberty, for example in connection with the development of sexual identity, can also be conveyed more impressively and appealingly by an avatar that belongs to the peer group than is currently possible with explanatory texts or videos.

Similar to the context of the reception of content, it can be assumed that experiencing exhibitions and concerts, as well as maintaining contacts and relationships, will intensify in the metaverse. Among other things, new technologies will make it possible to experience touch and taste digitally (Magos, 2024, Fraunhofer, 2022), thus enriching gatherings with family or friends at the virtual dinner table.

## 4 Empowerment for the metaverse

As described above, there will be a wide range of content, experiences and opportunities in the metaverse. These can be generated and made available by both companies and users, and can have both positive and negative effects on recipients. Even today, artificial intelligence can be used to generate content more quickly and distribute it more widely. In the metaverse, these effects are expected to be amplified, intensifying the impressions experienced and increasing their potential influence. This makes it necessary for users to enhance their skills and abilities in dealing with content in order to make the necessary selection decisions, to recognise attempts at fraud and manipulation, and to be able to keep themselves away from harmful content and protect themselves from it. It is important to be aware of these impacts in order to make informed choices about content and services, and to reflect upon our own responsibilities and actions.

When the metaverse becomes a living environment for children, it must be taken into account that they gradually develop their abilities (evolving capacities). Knowledge of the capabilities of artificial intelligence and personal experience of virtual environments will enhance the ability to use them appropriately, meaningfully and purposefully. This acquisition of skills can be stimulated and supported by appropriate content and services for young people. This is another reason why States Parties are obliged to allocate public resources to ensure children's rights in the digital environment by providing quality content and services (Article 17 CRC, para. 28 GC 25). It is also important to educate children about risks and potential dangers and to enable parents and educators so that they can support young people and be available to them as a competent contact person (para. 32 GC 25).

## 5 Protection in the metaverse

In addition to the expected positive effects of the metaverse on children and their rights, there is a risk that negative effects will become more apparent. For example, psychologists suggest that existing harmful effects of social media on the psyche of young people in terms of sexualised, racist or violent content could be exacerbated in the metaverse (Huddelstone, 2022). AI can also lead to information concentration and exclusion, accelerate the division of virtual communities into spaces where only similar views and opinions are regularly exchanged, and facilitate the spread of misinformation and propaganda. These negative effects are highly relevant to society as a whole, but are particularly critical for children and young people, who are still developing their own identities and learning to recognise themselves as part of the community. Against this backdrop, there are calls for regulation in order to preserve and

promote democratic pluralism, which is essentially based on the existence and tolerance of diversity and differences of opinion as well as the (further) development of individual views and perspectives. In this context, the labelling of content generated by artificial intelligence is one of the measures called for (FSF, 2024, Reid, 2021).

Socialising and maintaining relationships in the metaverse will further increase users' investment in their virtual identities, both in terms of time and money. Around 40 per cent of young people already consider their virtual representation to be more important than their physical one (Wienreich, 2024). Self-representation as a three-dimensional avatar and the associated effects of digital embodiment will reinforce this. However, in addition to opportunities for self-presentation and optimisation, there are also risks of identity deception, which can be relevant, for example, in the initiation of sexual contact between adults and children (grooming) and in connection with bullying or fraud. In this context, the (unconscious) development of parasocial relationships with AI-controlled avatars must also be taken into account. The lack of mutual recognition and relationship building can lead to the loss of essential mechanisms and competencies, such as the negotiation of compromises, which could jeopardise peaceful coexistence in communities (Hippel, 1992). There is also a need to regulate the acquisition of an avatar's equipment and skills, as well as their ownership, for example when it comes to transferring them to other platforms and experiences. Last but not least, there is the question of the possible economic exploitation of children in the metaverse. A design of a service that relies on the inexperience of young users and attempts to exploit this fact for its own (economic) advantage, for example by inducing children to make decisions and take actions that are against their own interests, would counteract the protection of personal integrity. Current studies on existing services (Kammerl et al., 2023) already indicate that States Parties could be called upon to contribute to the realisation of children's rights through targeted measures (para. 36 GC 25).

In the metaverse, children will use services that were not originally designed for a young audience. These services will collect and process large amounts of sensitive data, for example by tracking users' gaze and movement in virtual environments, or by measuring their brain activity (Reid, 2021). In the future, children in particular will find it more difficult to recognise that data is being collected and transferred to and from one or more services (Croll, 2021).

## 6 Conclusion

The metaverse will offer a wide range of opportunities for children's rights, interests and needs, as well as risks and dangers. To ensure that these do not have a negative impact on young users, and that children can make the best and most of the potential of the metaverse for themselves and their development, it will be necessary to develop and design associated services and applications with children's rights in mind (children's rights by design).

Providers of content, experiences and opportunities in the metaverse also have a responsibility to uphold children's rights (Para. 35 GC 25). Monitoring processes are required to realise children's rights in the development and implementation of services and experiences, as well as the reform of existing and the adoption of specific regulatory requirements for virtual worlds and artificial intelligence. In these processes, the best interests of the child, which cannot be determined without the participation of children (Art. 12 CRC, GC 12, para. 16f GC 25), must be a primary consideration (Art. 3 CRC, para. 12f GC 25).

In order to ensure growing up safely with media for all children in an increasingly digitalised world, barriers to access must be removed (Para. 9 GC 25), potential for the development of talents, gifts and interests must be realised, impairments and risks to children's development (Para. 14f GC 25) must be avoided and the (virtual) identities of young users must be protected (Art. 8 CRC, Para. 60 GC 25).

The concept of personal integrity, which is enshrined in the German Youth Protection Act, creates a suitable foundation for ensuring the well-being of the population of the metaverse. It combines essential rights that are coming to the forefront in the context of virtual worlds and artificial intelligence to protect the integrity of each person and their digital representation, paving the way for a metaverse in which people will move around as avatars. In a digital environment based on the recognition of personal integrity, allowing encounters in real time and in (digital) presence, according to Wienreich (2024) the hatred and destructiveness promoted by spatial and temporal distance in today's social media could be turned into something positive, and personal interaction with one another could become more social again. This would be the step from the Internet of Things to the human metaverse.

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