

Protecting children in virtual worlds (the metaverse)

While virtual worlds can boost children's creativity and motivation to learn and even help them heal from diseases, they also pose multiple challenges, not least regarding privacy and exposure to harmful and illegal content. Both the European Union (EU) and the private sector have taken steps to protect children in virtual worlds, but there is still much to be done to ensure that children are not exploited or harmed in this environment.

Introduction

[Virtual worlds](#) (also referred as the [metaverse](#)) offer persistent, immersive environments that blend physical and digital worlds in real-time across various areas, such as entertainment, education, commerce, health and social life. These [worlds](#) are supported by extended reality (XR) technologies, such as virtual reality (VR), augmented reality (AR) and mixed reality (MR). In recent years, these technologies have seen significant advances. As [components](#) have become cheaper and more efficient, some VR, AR and MR headsets have become more affordable. Headsets have improved in terms of wireless experience, ultra-realistic images, [content creation](#) and integration of other technologies, such as artificial intelligence (AI).

Opportunities

Virtual worlds can change children's daily lives, enabling them to [learn](#) about ancient times, and places or things they would otherwise (most likely) never visit or see (such as outer space, the depths of the ocean or microscopic chemical reactions) in a more engaging and immersive way. One example of how virtual worlds are used in education is [Finnish platform Lyfta](#), where teachers can access immersive content to take their students on virtual trips; another example is the use of virtual reality to make museum visits a more immersive experience. Taking advantage of this feature, in a special exhibition, the [Louvre](#) allowed visitors to see the Mona Lisa with VR glasses that brought the masterpiece to life and provided historical context. Virtual worlds can also be helpful for learning a new [language](#), allowing students to practice conversations in a virtual [foreign country](#) from the comfort of their home country.

Virtual worlds also offer new forms of **social interaction and cultural events**. VR concerts by [artists](#) or bands – such as Travis Scott, Justin Bieber or The Weekend – who are loved by children, have been viewed by millions. There are also numerous [3D interactive worlds](#), where players can interact in real time.

Virtual world technologies can be used to diagnose and treat various **paediatric mental and physical health disorders** (such as autism, attention deficit/hyperactivity disorder). They can also be used to promote physical health through immersive fitness exercises, to help prepare children for psychological difficulties (such as the fear of heights) or to aid in their [physical rehabilitation](#).

Challenges

Many of the risks children face in virtual worlds are common to those faced by adults in these environments. However, their vulnerability often puts children more at risk. As evidenced by various reports (such as the 2023 [report](#) by the Centre for Countering Digital Hate), minors are regularly exposed to various forms of harassment, abuse and age-inappropriate content in virtual worlds.

Virtual worlds can also have various negative effects on **children's physical and mental health**, such as isolation from the real world, loneliness and addiction. They can cause [side effects](#) such as nausea, dizziness, [anxiety](#) and fear. Discomfort from wearing the necessary equipment is another issue. For instance, the prolonged use of a headset can cause neck fatigue and eye strain.

In addition, there are numerous risks around **privacy, data protection and unfair marketing practices**. When children access virtual worlds, companies can collect not only [data](#) about their interests, product



preferences and surroundings but also more subtle information such as eye movement, facial expression, heartbeat and gestures. All this raises questions of how this data is used, whether children could fall victim to unfair marketing practices and if the data is sold to third parties. [Research](#) shows that children may be aware that their activities are being tracked online and that they are being exposed to advertisements, but they struggle to understand fully the processes of data collection and resulting commercial profiling.

Although headsets are tending to become more [budget-friendly](#), many can still be quite costly and are thus more accessible to children from wealthier families. Without public or private sector support, virtual worlds can increase social inequalities. Additionally, these technologies may be inaccessible to certain groups of persons, including children with [disabilities](#) (e.g. those with visual impairment).

European Union action to protect children in virtual worlds

The [European Commission](#) has funded targeted research and innovation in virtual world technologies through the Horizon 2020 and Horizon Europe programmes. It has funded, for example, the [Arete project](#), which aims to apply AR for English language learning or for the attainment of behavioural skills (where students learn, for example, how to improve their self-regulation skills) in primary school. The Commission has also funded various projects through the Creative Europe programme (e.g. the [Meta Stories](#) project that for instance organised an online EU film festival within the video game [Minecraft](#)). The [EU](#) also conducts research on virtual worlds and invests in various initiatives helping to improve children's digital literacy (through initiatives such as the [Better Internet for Kids portal](#), the [Safer Internet Centres](#) and the [Digital Skills and Jobs Coalition](#)). In July 2023, the Commission also adopted a [strategy on Web 4.0 and virtual worlds](#).

Several EU laws protect children in virtual worlds. For example, the [Digital Services Act](#) prohibits online platforms (including virtual worlds) from targeting advertising based on minors' personal data. It also strengthens content moderation rules and sets obligations for the largest platforms to address systemic risks such as the dissemination of illegal content. The [General Data Protection Regulation](#) obliges online platforms, including virtual worlds, to adhere to strict data protection rules and principles. For example, it requires obtaining users' explicit consent to process their personal data. The [Regulation establishing a framework for a European digital identity](#), recently adopted, should help verify user age.

Not all issues related to protecting children in virtual worlds have been resolved. For example, the EU co-legislators have not yet adopted the 2022 [proposal for a regulation to prevent and combat child sexual abuse online](#), which would make it mandatory for service providers to detect, report, block and remove child sexual abuse material on their platforms (including from virtual worlds). Some [critics](#) of the proposal question whether it fully respects fundamental rights to privacy and data protection. Until [April 2026](#), service providers are allowed to detect the presence of child sexual abuse material voluntarily.

European Parliament

In 2024, the Parliament adopted two resolutions on virtual worlds: the [first](#) focusing more on virtual worlds' implications for the single market and the [second](#) dealing with civil, company, commercial and intellectual property law issues related to virtual worlds. Both stressed the need to recognise the specific needs of children and give them the necessary digital skills to participate in virtual worlds. The first, in particular, highlighted the importance of designing and operating online services and products that are mostly accessed by children and are safe for children by design and default.

Private sector measures to protect children in virtual worlds

Several online platforms, such as [Meta Horizon Worlds](#), have put in place [tools](#) designed to offer children a safer and more age-appropriate experience in virtual worlds. These tools include various methods to verify the child's age, content moderation, privacy settings, personal boundary settings (distance between avatars), safe chat features, default settings for minors and parental control features (which allow parents or guardians, for example, to see their children's followers' list, VR activity, screen time and personal boundary settings). Furthermore, VR headset manufacturers usually set a minimum age for using these devices. However, there is a tendency to lower this minimum age. For example, in 2013 Meta lowered its [Quest](#) headsets' minimum age from 13 to 10 years. Representatives of industry, civil society and academia are also helping the European Commission to develop an [EU code of conduct on age-appropriate design](#) to ensure privacy, safety and security in virtual worlds.

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