VIRRAC TOOLKIT REPORT

VIRTUAL REALITY RISKS AGAINST CHILDREN

A REPORT FOR PRACTITIONERS, POLICY MAKERS, LAW ENFORCEMENT & INDUSTRY

LEADS

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Table of Acronyms

VIRRAC	Virtual Reality Risks Against Children Project
MV	Metaverse
AR	Augmented reality
AI	Artificial intelligence
VR	Virtual reality
CSAM	Child sexual abuse material
CSEA	Child sexual abuse and exploitation
REPHRAIN	National Research Centre on Privacy, Harm Reduction and Adversarial Influence Online

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1. EXECUTIVE SUMMARY

1.1 Research aims of VIRRAC

The primary aim of VIRRAC was to raise awareness of child safety in the metaverse, and to better understand the harms that children and young people face in this immersive environment in order to explore practical solutions.

The four pillars of investigation within VIRRAC were as follows:

(1) To develop **an understanding of the existing challenges that are faced by tech companies**, using MV apps in their drive to ensure the greatest number of children, including neurodivergent children, can navigate platforms safely.
(2) To develop a greater understanding of the **knowledge gap and resource needs of professionals and practitioners** working with children at risk of abuse and exploitation in the MV.
(3) To improve **safeguarding and police understanding of the MV** and facilitate their ability to report and investigate child sexual abuse offences that occur in the MV.
(4) To develop a **greater understanding, from the voices of children**, regarding their MV safety and wellbeing support needs.

1.2 Research Context

Young people typically spend long periods of time online every day, and the time spent on digital devices (including smart phones and video gaming) is largely perceived as too long to spend online by parents (PEW research centre, 2020). The number of children and young people known to use virtual reality headsets and engage in the metaverse is rapidly increasing across the world (IET, 2023). The metaverse brings unprecedented opportunities to learn, communicate and game for thousands of users worldwide, offering new forms of immersive communication and the opportunity to play, develop skills and to meet new friends from all over the world. These exciting opportunities also result in increased potential for users to experience exposure to risk and harm. This is especially the case for more vulnerable or impressionable audiences, such as children and young people. Metaverse platforms are already reporting instances of online grooming and cyberbullying (BBC, 2019) and we know that online sex offenders are already using 2D metaverse platforms as spaces to identify victims, and lure children into private arenas (Afzal et al, 2021). However, society is not yet equipped with the understanding, tools or the skills that are needed to try to mitigate these harms for young metaverse users. For instance, educational awareness programmes across the UK do not typically address (or even acknowledge) harms in the metaverse. As the metaverse continues to evolve and to grow in access and popularity worldwide, it is expected that children will continue to encounter risk and harm. Academics, industry developers, police forces, policy makers and third sector organisations will need to adjust, collaborate and ultimately respond tactfully to ensure child safety in the metaverse is prioritised and accounted for.

1.3 Methods

The VIRRAC team established a Stakeholder Advisory Board comprised of industry and practice experts, conducted an extensive review of the wider literature and undertook a series of focus group interviews with children and young people and with experts in the field.

1.4 Summary of Findings

The findings form the focus groups with children and young people suggested that encountering harm, experiencing pressure to share personal information, and being exposed to unfavourable content was relatively common. The experts and young people who participated in the VIRRAC research studies unanimously recognised the need for more guidance, awareness, support and platform online safety features to keep young users safe from harm in the metaverse.

- **Psychological & physical risks** - The focus groups with children and young people indicated that despite their age, the participants are acutely aware of a range of potential psychological and physical risks that engaging in immersive technologies might lead to and make attempts to actively avoid these risks.
- **Positive aspects** - The focus groups with children and young people uncovered a unique, broad and interesting range of perspectives about what young people like about immersive technology, and what they perceive to be especially enticing about spending time in the metaverse.
- **Experiencing harm** - The Expert Roundtable raised concerns about virtual assault incidents and the possible impact on childhood development in relation to cognitive effects of VR use, neuroplasticity, and even potential physical harm from prolonged VR headset use. Experts voiced concern about specific vulnerabilities among children with special needs and those on the neurodiverse spectrum, and requirements for closer caregiver attention.
- **Age verification** - Addressing age verification, parental involvement and understanding and safety protocols is crucial to safeguarding children in the metaverse.
- **Further research** - The literature review evidenced the potentially detrimental psychological and physical impacts that immersive technologies might have on frequent users, but further highlighted the need for additional empirical research, as well as the application of academic theory (for instance criminological, psychological and sociological perspectives) to aid current understandings of youth safety in the metaverse, and possible avenues for the mitigation of harm.
- **Safety by design** - VIRRAC has further emphasised the current lack of investment and encouragement in safety by design, and the crucial need for industry to develop evidence-based, user-friendly and user-tested safety features for immersive technologies.

1.5 Outputs

This Toolkit Report includes a discussion of findings and evidence-led guidance and recommendations for policy, industry and practice. This report provides a detailed account of the VIRRAC project, aa discussion of the findings from which form the basis of 6 evidence-led tools and tools to will inform policy and practice in a range of areas. Please note: a more detailed account of VIRRAC research findings will be published separately.

The tools have been developed specifically for use by educational institutions (tools 2 and 3), frontline practitioners (tool 2), industry (tool 4), parents and caregivers (tool 1), and children (video resource).

The outputs provide a starting point and will inform the future development of a full and interactive 'Child Safety in the Metaverse' educational programme which the team aims to develop in full as a priority in their continued work in the area of child safety in the metaverse.

1.6 Recommendations

VIRRAC has highlighted a lack of literature available specifically focusing upon child safety in the metaverse, but also a lack of dedicated resources and awareness raising initiatives for educational institutions, frontline practitioners, law enforcement, parents and carers, and, more strategically, for policy and practice.

Key Recommendations and Considerations for Future Research, Practice, and Policy

These recommendations aim to guide future efforts towards creating a safer environment for users, particularly children and young people, in the evolving landscape of the metaverse.

- **Incorporate Children's Voices:** Research is required to integrate the experiences, perspectives, and recommendations of children and young people concerning safety measures within the metaverse (MV).
- **Investigate Harms First-hand:** Further investigation into the first-hand harms experienced by children and young people in the MV, incorporating their lived experiences, is essential.
- **Explore AI Moderation:** Insights from discussions on AI moderation, as discussed at the Westminster e-forum conference (8th February 2024) should be leveraged to inform future initiatives.
- **Review Safety Features:** Conducting a comprehensive review of existing safety features already implemented (safety by design) on platforms could provide valuable insights for industry best practices, particularly benefiting small and medium-sized enterprises (SMEs) and start-ups.
- **Consider Legislative Scope and effectiveness:** Although in theory the OSA should cover VR harms and offences, there is some debate regarding the effectiveness of the legislation in addressing these issues.
- **Raise Awareness:** There is a critical need for widespread awareness-raising campaigns focusing on child safety in the metaverse.
- **Integrate into Education:** There is a need to incorporating the MV into educational resources on online safety for schools.
- **Integrate into Training:** Training programs for police forces and the Crown Prosecution Service should include modules addressing the unique challenges and safety considerations of the metaverse.
- **Increase Investment:** Increased investment is needed to enhance detection and mitigation efforts for harms within the metaverse.
- **Facilitate Cross-Sector Collaboration:** Prioritising and facilitating effective cross-sector collaboration across key domains such as education, health, criminal justice, academia, and industry is vital.
- **Revision of Safety Efforts:** Safety by design and prevention efforts by platforms in VR and AR environments should be reviewed, exploring potential applications of AI moderation and the feasibility of implementing age verification for VR headsets.
- **Collectively Develop Society's Understanding** of the technological components that comprise the metaverse.

- **VR Headsets:** Ensuring that collected data is used responsibly, and at the minimum, especially when children are involved. Headsets collect a staggering amount of personal data such as motion or heartbeat data, that can provide unique insights into the users' physical and mental state. Ensuring that this data is used responsibly, and at the minimum, especially when children are involved, should be a priority.

2.INTRODUCTION

2.1 Project Aims and Objectives

The VIRRAC (Virtual reality risks against children) was a small-scale 1-year project (February 2023-2024) funded by the National Research Centre on Privacy, Harm Reduction and Adversarial Influence Online (REPHRAIN) and UKRI. The overarching goal of VIRRAC was to better understand and respond to harms that children and young people may face in the metaverse (2D and 3D environments), and to consider how risk might be mitigated in these virtual spaces. This research project included several strands of investigation, all of these were guided by a Project Stakeholder Board comprised of experts from online safety education, industry and practice.

This is a summary of the full VIRRAC Report. The full VIRRAC Toolkit Report includes a literature review, a chapter dedicated to research findings, and evidence-led guidance and recommendations for policy, industry and practice. The full report provides a more detailed account of the research findings which form the basis of 6 evidence-led tools and a Toolkit that will inform policy and practice in a range of areas. Six tools have been developed specifically for use by educational institutions (tools 2 and 3), frontline practitioners (tool 2), industry (tool 4), parents and caregivers (tool 1), and children (video resource). The outputs provide a starting point and will inform the future development of a full and interactive 'Child Safety in the Metaverse' educational programme which the team aims to develop in full as a priority in their continued work in the area of child safety in the metaverse.

VIRRAC was led by a multi-disciplinary collaboration between The Institute for Connected Communities at the University of East London and the Centre for Abuse and Trauma Studies at Middlesex University. VIRRAC was co-led by Director and Professor Julia Davidson OBE (ICC UEL) and Associate Director and Associate Professor Dr Elena Martellozzo (CATS MDX). Dr Ruby Farr was Project Manager (ICC UEL), Paula Bradbury a Senior Researcher, and Boglarka Meggyesfalvi (CATS MDX) a Researcher.

The VIRRAC Toolkit Report will serve as a valuable resource for professionals and practitioners, offering insights into metaverse dynamics that can assist those directly engaging with children. This awareness can enhance children and young people's resilience to metaverse abuse. Furthermore, it can be utilised by various stakeholders including police forces, policymakers, third-sector organisations like Childnet, the SWGFL and educational services to raise awareness about the metaverse and its associated risks to children.

This TOOLKIT report has been reviewed by Childnet, the VIRRAC expert Stakeholder Board and disseminated by the project partnership members and the wider REPHRAIN and VIRRAC network.

2.2 Child Safety in the Metaverse: Project Context and Background

There is no doubt that we are at a transformative moment for the digital safety of children. Prior to the pandemic, research identified that up to 45% of teens are online almost constantly (Pew Research Centre, 2018). Post-COVID, it is estimated that daily screen time has increased further, up to 8.8 hours for youth populations (Pandya & Lodha, 2021). Children as young as 2 are gaining their first digital devices (PEW research centre, 2020). Children are utilising VR headsets more than ever before. Defining the metaverse presents challenges given its constantly evolving nature. Numerous definitions and associated concepts coexist in this space. The definition adapted in this research was initially provided by UNICEF, which describes the metaverse as the '3D internet'. It encompasses activities such as socialising (e.g. attending concerts), gaming (via video games and world-building), and working (such as workplace readiness training), facilitated through digital avatars (adapted from UNICEF, 2023). Children are at risk of encountering child sexual abuse (CSA) and child sexual exploitation (CSE) in the metaverse, but currently we don’t know what form this will take, or where.

Metaverse platforms that facilitate online gaming and social interaction may not have robust, child tested and evidenced safety measures in place, and this poses practical risks to children and young people who are engaging in 3D VR spaces and experiencing harm. Additionally, law enforcement agencies across the UK and world-wide are currently unfamiliar with and untrained in the MV, and therefore lack the capacity to respond to MV CSEA and other harms such as cyberbullying.

Aside from the conceptual and practical barriers regarding child safety in the metaverse, it must also be noted that practice with child victims and vulnerable children does not currently address harm in the MV in assessment or in therapy, resulting in a reduced capability for practitioners to know how to respond confidently when this arises. Educational awareness programmes in the UK, and transnationally, do not currently address risks in the MV, leaving many frontline teachers unaware of potential harms children face, but, more importantly, lacking the safeguarding information and protocols should a student experience harm in the metaverse.

The metaverse (MV) brings with it a lot of positive features for children and young people's cognitive, social, and emotional development (Chang et al, 2020; Pallavicini & Pepe, 2020), but also an increased opportunity for poor mental wellbeing (Lavoie et al, 2020) and the possible increased risk of child abuse (particularly grooming) by adults (Hu, 2022; Usmani et al, 2022). Whilst the user level of 360-degree, 3D MV platforms is still in its infancy, 2D MV platforms have never before been so popular amongst children. With over 202 million registered accounts, and on average 43 million daily active users on Roblox alone (Backlinko.com, 2024). These meta-apps have reported experiencing daily challenges in tackling grooming (Broadhurst, 2019), cyberbullying and suicide ideation (Roblox, 2022). Online sex offenders are known to use online 2D MV platforms to lure children into encrypted chat apps such as Snapchat and Kik in order to facilitate nude image sharing and exploitation (Afzal et al, 2021).

With increasing advancement and popularity of metaverse engagement, the industry sector is consistently investing vast amounts into metaverse platforms, for example Disney recently invested 1.5 billion dollars into *Fortnight* developer *Epic Games* for the creation of new digital worlds (Craig, 2024). The Apple Vision Pro was also launched in the United States in February 2024 (Apple, 2024) which is a new VR headset that seamlessly blends digital content with the physical world; unlocking unprecedented powerful immersive spatial experiences. MV, 3D immersive platforms, already exist and are being used by children to interact with strangers online. We are already seeing instances of child abuse being exposed by social gaming influencers on MV platforms where people from anywhere in the world can meet up and develop relationships (VRChat.com, 2022). In 2021, a YouTube influencer revealed the prevalence of online predatory behaviours against children in chat rooms in the metaverse in which children are targeted for private sexual acts with an age recommendation of 13+ but openly "welcomes people of any age".

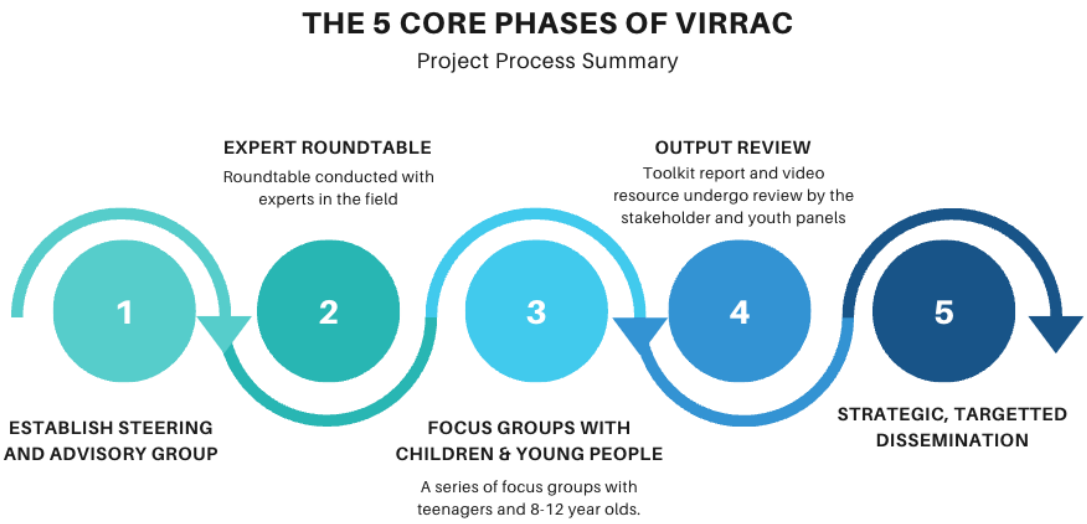
2.3 Defining and Understanding the 'Metaverse'

The Metaverse is a fluid and nuanced term, with multiple understandings and definitions. Within academic discourse, two predominant viewpoints have emerged regarding the concept of the Metaverse: the first perspective posits the term as synonymous with a (3D) "virtual world," implying a digital environment that replicates real-world characteristics; while the second viewpoint claims that the Metaverse extends beyond the confines of virtual worlds and envisions it as a "VR-based internet", serving as a collaboratively constructed virtual extension of our physical reality (Cho et al, 2022). Nevertheless, there is a consensus that the Metaverse entails the blending of physical and virtual worlds, facilitating immersive interactions between the user and the worlds through the utilization of avatars or extended reality (XR) technologies. Essential characteristics of the Metaverse according to XRSI, a standard developing organisation, encompass presence (the feeling of being present or

physically located within a digital environment), persistence (the ability of virtual objects, environments, and experiences to persist over time, even when participants are not actively interacting with them), immersion (the intensity of engagement and absorption in a virtual environment), and interoperability (the ability of different virtual worlds and systems to communicate and interact with each other seamlessly, allowing individuals to move freely between different digital environments and experiences) (XRSI, 2023). To create a convincing virtual world, it needs convergence of cutting-edge, such as extended reality (XR) that includes Virtual Reality (VR) and Augmented Reality (AR), artificial intelligence (AI), and decentralised ledger technologies (DLTs), real-time, low-latency networking, and facilitation seamless interactions among numerous participants that led to advancements in sensory and brain interfaces, amplifying the immersive nature of the Metaverse (P. Faraboschi et al, 2022). The Metaverse has been described as '*a concept widely regarded within the computer industry as the future evolution of the internet: a unified, continuous, and immersive 3D virtual environment where human experiences transcend the limitations of the physical world'* (Patel 2023).

3. RESEARCH DESIGN

This report and the recommended tools have been shaped by the insights and input of industry experts and young people. We explored young people's perceptions of existing, near future, and future risks faced by children. We also explored the challenges associated with moderating online harms in metaverse platforms. Insights gathered informed the development of the resource toolkit.



As part of Phase Five, we launched a film resource (on Safer Internet Day 2024) and more details about the tools developed by the VIRRAC team can be found in the Appendices section.

4. RESEARCH FINDINGS

Understanding the Metaverse: Voices of children and young people

In this research, we placed children's voices at the forefront, recognising them as active participants in the landscapes of the metaverse. Their engagement, lived experiences, and perspectives were indispensable in comprehending the intricacies of online safety in this ever-evolving digital era. By centring the voices of children in our work, we aimed to explore their encounters, discern their perceptions of risks, and understand their safety needs. Only through this inclusive approach could we gain insight into the multifaceted challenges they encounter and explore effective strategies to mitigate potential harm.

This inclusive methodology included two phases of data collection, targeting distinct age groups: adolescents aged thirteen to eighteen years and pre-adolescents aged eight to thirteen years. By engaging with these diverse age cohorts, we sought to capture a spectrum of experiences, ensuring a comprehensive understanding of the nuanced dynamics at play within the metaverse.

Expert Roundtable: Summary of Findings

The research with experts highlighted the Metaverse's transformative potential for children, offering inclusive, physically engaging experiences that can also benefit neurodiverse individuals and serve as a powerful medium for self-expression. However, they noted that challenges in online safety included cyberbullying and harassment, with concerns about griefing, the act of deliberating ruining and disrupting the play of others, and virtual assault incidents. The possible impact on childhood development raises questions about cognitive effects, neuroplasticity, and even potential physical harm from prolonged VR headset use. Specific vulnerabilities among children with special needs and those on the neurodiverse spectrum require closer caregiver attention. Addressing age verification,

parental involvement, and safety protocols is crucial. Listing recommendations, experts mentioned collaboration between stakeholders, safety-by-design, and the development and implementation of comprehensive guidelines for a safer Metaverse for children.

The VIRRAC Research Findings: A Discussion

Despite differences in age, there were many similarities regarding the perspectives and experiences shared across the VIRRAC focus groups with young people. Across all focus groups, harmful experiences were shared by participants, including either witnessing or being a direct victim of hateful speech or harassment in the Metaverse. A finding that that was in alignment with existing research exploring exposure to hate crime and harassment that was discussed earlier in the literature review section of this report. While the overall sample size included in this VIRRAC research study was small, this finding does indicate that harmful incidents in the Metaverse are relatively commonplace and further highlights the crucial need for a targeted and collaborative approach to safeguarding children in the Metaverse.

Further, within discussions across all the focus groups with young people, the need for more readily accessible and user-friendly safety and reporting features was notable. While participants across both age groups shared examples and advice with each other regarding staying safe online, there was a prominent lack of in-platform solutions shared, and the examples that were shared typically included making safety informed choices whilst engaging in the Metaverse such as being wary of new players, not accepting friend requests from people they did not know, and not sharing any personal information. This, in conjunction with their experiences of harmful behaviours, indicates that children do feel vulnerable in online spaces and that they want more safety moderation features to be in place to increase their sense of safety. Whilst the children across all age groups acknowledged the risks, they still reported in actively engaging in behaviours that would increase risk through engagement with people they do not know. These findings again support the literature review as children demonstrated that despite knowing the risks, many young people are willing to engage in risky behaviours, nonetheless. In acknowledgement of this, more protective features, and educational input through behaviour modelling guidance can mitigate some of these risks.

The vastness of choice available across metaverse platforms was noted within this research. It should be noted here that there are the metaverse platforms, and there are games in the metaverse. These games can be created by a different company to the platform creator, and the level of control the platform holds over the games as gatekeeper is ambiguous. There are implications of this, not least to recognise that industry is not homogenous in the metaverse and queries the level of responsibility a platform can or should have for the safety within a game.

The physical aspects and personal boundary configurations when using VR headsets also proved to be an integral factor for staying safe across the age groups. Both ages of young people who took part in this research indicated forgetting that they were using immersive technology, because it did feel so real. The older age group were very aware of the potential to cause physical harm to oneself while engaging in the Metaverse, for instance they suggested the need for restrictions and guidance and felt safer knowing there were others watching over them whilst they had the headsets on. The younger age groups, on the other hand, shared their preparation routines during the focus groups, including clearing the space around them of any obstacles such as toys. The focus groups highlighted the need for clear, user-friendly and evidence-led guidance covering physical safety.

The benefits and enticing features available within metaverse platforms were notably different in the reporting from the two different young age groups. The younger age group, 8–12-year-olds, who were

avid metaverse users in comparison to the older age group, spoke more of the opportunity to explore their imaginations, and dress their avatars up and meet with their existing friends and relatives in the metaverse to play, while the focus of the elder age groups was more centred around engaging in complex games in open arenas with people they did not know.

Across all elements of empirical research conducted, including the Expert Roundtable and the focus groups with young people, there was a unanimous call for safety by design solutions and increased cross-sector awareness and guidance for staying safe in immersive environments.

5.EVIDENCE-LED GUIDANCE

Drawing upon the findings from the literature review and all three strands of data collected within this VIRRAC study, we have created the following guidance. This section aims to inform a multi-stakeholder approach toward ensuring child safety within the Metaverse ecosystem. The guidance has been presented across four overarching sub-headings:

(6.1) Guidance for Industry,
(6.2) Guidance for Practitioners,
(6.3) Guidance for Parents and Caregivers,
and (6.4) General Guidance for Metaverse Safety.

5.1 Guidance for Industry: Safety by Design

Introduction

The findings from this study have highlighted the importance of amplifying safety by design/ Safety Tech in the pursuit of improving child safety in the Metaverse. Improving safety and reporting features is vital. This research has also uncovered the potential for categorising the types of harm that could be caused in the Metaverse, and how best to respond to these (i.e., physical harm, harm to mental health etc). This is an important issue in the context of the Online Safety Act and subsequent regulation. Social media sites and other platforms within scope of the Act will be required to undertake annual risk assessments to ensure that their platforms are child safe.

Mitigation – technology assessment

1. Assessing risks and impacts on victims' mental health
2. Assessing risks on the facilitation of the development of offender networks
3. Assessing the risks of the different types of abuse and the different forms of technologies involved in the development of the Metaverse
4. Implementation of safety solutions allowing immediate reporting on ongoing abuse on the platforms and in chatrooms

Empowering young users

The aim of the following recommendations is to provide elements of consideration in solutions development and implementation to provide capabilities to their users to protect themselves and seek help on their platforms and additional add-ons.

1. Allow/enable the emergency exit of characters from an environment followed by reporting
2. Implement solutions that are user friendly and easy to identify by the users and enable them to seek help or block other users without having to exit the game they are engaging in
3. Highlight/emphasize visible messages about the fact that abusive/harmful behaviour is not the fault of the victim, and reporting/intervening is important both for their own and others' safety.

Reporting in the Metaverse

Reporting abuse is an important element allowing the user to have the ability to take action on abusive and harmful behaviour – this study has demonstrated that the process can however be daunting and distressing for the user. These recommendations aim to provide elements of consideration to facilitate users' reporting and mitigate the increase of distress in the process.

1. Facilitating reporting though the development of clear adapted reporting processes
2. Provide clear explanations to the users on how the report will be processed
3. Provide an option to report anonymously
4. Provide additional support specific to the nature of the report
5. Provide feedback on what is happening at each stage after the report has been submitted/ assessed, if it is asked

5.2 Guidance for Practitioners

The VIRRAC Project, has identified several ways schools can increase safeguarding in responses to advancements in Metaverse technology, these are discussed below.

Professionals and practitioners working with children, and for those whose role is related to safeguarding and protecting children, there are variances in the forms of disclosure that may be received as well as the timing of the event of any harm occurring. For example, teachers and classroom assistants have an increased likelihood of receiving information about any online harmful behaviours being experienced by a child in a more immediate timeframe (Brennen & McElvaney, 2020), allowing more opportunities for intervention internally alongside the parents and children involved, or escalate those concerns to external organisations for additional safeguarding support or criminal investigation. There are several things that schools can do to increase online safety, guide children on appropriate and inappropriate behaviours, assist children in reporting online harmful behaviour both online and offline.

An important piece of guidance provided for schools in the UK, relating to 'whole school' approaches to online safety, is the Keeping Children Safe In Education (KCSIE) guidance. Within which statutory guidance is provided on the approaches that schools should be taking to online safety. Specifically, focusing on four key areas, otherwise known as the 4Cs; Content, Contact, Conduct and Commerce (Livingstone & Stoilova, 2021). These four areas specifically address exposure to illegal, harmful or inappropriate material which includes verbal, written and visual ***content,*** The risk of harm as a result of ***contact*** with others such as predatory persons, harm from the ***conduct*** of others online which could include cyberbullying and the sharing of indecent imagery or cyberflashing, and finally the financial risks posed to children through online gambling and in app purchases as a feature of ***commerce*** (Allen & McIntosh, 2023).

KCSIE also includes advice on restrictions within school premises, peer-on-peer abuse, recommended training, annual reviews of online safety protocols and guidance (The Education People, 2023).

However, whilst the KCSIE guidance, and the 4Cs do not specifically mention the Metaverse, it is possible to apply the recommendations to VR context as it provides some useful requirements for schools to tackle and empower children to stay safe online. Primarily, it is essential that schools keep abreast of the latest advancements in technology so that they can evolve their approach to teaching and training online safety.

Training for staff

One of the greatest barriers to increasing online safety specific to the Metaverse centres on a general lack of knowledge around what the Metaverse is, how it is used, the risks and ways in which privacy and restrictive settings can and should be used. Ranging from the types of hardware available, the different Metaverse platforms and apps accessible to children, settings and features, including reporting functions. It would be ideal for, at the very least, the school's Dedicated Safeguarding Lead/Team and the Online Safety Lead in the school have a working experience of the Metaverse to understand it's capabilities (Onu et al, 2023).

PSHE Lessons

Personal, Social and Health Education (PSHE) lessons are ideal opportunities to engage with children on the topic of online safety in the Metaverse as a wealth of topics, such as relationships, intimacy, mental health and wellbeing are part of the education curriculum. These lessons can be expanded to include topics relating to the Metaverse and online harms. Using these moments increase children's understanding of how their behaviour can affect others, how to self-regulate in these environments, provide opportunities for positive behaviour modelling (Sibanda & Mathwasa, 2020), understand how engaging with harmful content can affect wellbeing (McDool et al, 2020), seeking help and citizenship. Citizenship is particularly important as the Metaverse is about human engagement and interaction. Empowering children to speak up and report concerns is a common way in which victims of abuse become known to the relevant authorities (Allnock & Miller, 2013).

Assemblies and Safer Internet Day

Safer Internet Day is already a major annual event which schools participate in to ensure that they are engaging and demonstrating the statutory guidance provided in the KCSIE report. Despite this, it is important that schools include information about online safety, and the Metaverse in regular occurrences throughout the year. Assemblies are a way of doing this to increase sticky learning on topics such as behaviour, wellbeing, and ways of mitigating risks.

Engaging with parents

There is still a significant lack of knowledge around the Metaverse with many adults being completely unaware that children have been engaging with the Metaverse for years via games such as Fortnite, Minecraft and Roblox (Hudson-Smith, 2022). Parents will vary significantly in their knowledge and level of engagement around their children's use of technology. Therefore, schools can play a vital role in increasing parental awareness of Metaverse capabilities, features and safety tools. These can be shared via weekly newsletters, specific e-notifications of online safety tips, or through parenting workshops that can inform parents of how the school are approaching online safety.

5.3 Guidance for Parents and Carers

With the headset hardware being used predominantly in the home there are important contributions towards online Metaverse safety that parents and carers need to actively engage in. Whilst this fact is commonly accepted, research by the IWF has indicated that only 1 in 6 parents talk to their children about online safety, and only 27 percent setting restrictive access on their children's devices to restrict exposure to inappropriate content (Statista, 2024). Despite these concerning figures, parents and carers do recognise the risks and have significant concerns around safety in the Metaverse (Internet Matters, 2023).

Findings from our research focus groups with children have clearly indicated that children want there to be safety features on their digital devices;

Building upon the research findings there are several ways in which parents and carers can actively engage in increasing their child's online safety within the Metaverse.

Environment

Children viewed the environment in which they use VR headsets, to engage with the Metaverse, as being extremely important for developing a sense of safety and from preventing reality confusion:

A way of creating the right environment would be for children to use headsets in areas of the house where other family members, or people who care about their welfare, are present. Enabling them to hear the voices and movements of others who are in the 'real world', providing a sense of grounding from their immersive experience.

Time Regulation

Both children and adults enjoy spending time in the Metaverse, and the environment easily leads to a loss in the sense of time, also known as a phenomenon, called *Time Compression* (Mullen & Davidenko, 2021). By setting clear time frames on the length of time a child can use their headset is a recommended measure to protect wellbeing and minimise exposure. Lengths of suitable screen time are frequently debated and there has been no research that has demonstrated, conclusively, any correlating negative outcomes with time spent online. However, it is strongly recommended that parents and guardians er on the side of cautions as there are correlations between late night usages of devices and quality of sleep. Which is of significant importance for neurological and physiological growth (Mindell & Williamson, 2018).

In addition to this, it is important to regulate when, as well as where, children use VR headsets. Limiting time spent regarding the hour of day is also important. Parents should avoid allowing children to use VR headsets late at night. As well as this being an important recommendation made by children, it is also shown, through empirical research, that late night use of technology impacts on the quantity and quality of sleep (Fuller et al, 2017). However, it is important to note that research in this area, in relation to virtual reality and headsets is still in its infancy.

Application of privacy and restriction settings

Our research identified that children of all ages across the phase of adolescence actively called for the usage of privacy and restrictive settings for their devices. Settings that prevent them from accessing

areas in which they could be exposed to adult, harmful content, and settings that would prevent them from communicating with person's they do not know. However, in the boundless environment that the Metaverse applies there are still significant flaws in the safety nets that technology firms provide, requiring parents to be proactive in their application of restrictions and knowledge around the safety provisions on individual sites. For example, RecRoom is rapidly gaining traction as a progression from Roblox, yet unless the person downloading the app to the device states that they are a child then safety features will not be automatically applied. Parents and carers should always be involved when an app is downloaded so that they can be sure to read any safety advice and to register the app for the appropriate age of the user. It is also important to note regarding this this that currently VR headsets were originally assigned an age rating recommendation of age 13+. However, in 2023, this age rating was lowered to age 10 with the requirement for children to obtain parental permission before being able to download apps or accept new friend invitations. This is, of course, dependent on the accounts being purposefully set up as child accounts by adults and not pre-existing adult accounts.

Understand the apps your child is using

Despite only being in its infancy there are already a broad spectrum of games, applications and areas for social interaction that exist within the Metaverse, many of which may not have restrictive access using any form of age verification. Especially if the child is accessing an account that isn't specifically set up as a 'Child Account'. Regardless of this it is important to conduct some form of research into what your child desires to engage with prior to the usage of the app. This will provide you with an understanding of age recommendations, whether the app has any 'chat features', and any concerns and safety risks reported (Allen & McIntosh, 2023). It will also allow you to identify what privacy and restrictive settings can be applied specifically to your device.

Engage in the Metaverse Together

Parents are advised to communicate with their child regularly regarding their Internet use in order to ascertain not only what they enjoy, but also what they don't enjoy, including any experiences they may have had that they find upsetting or confusing. Young children might not understand why what they have experienced is wrong, or harmful. By regularly engaging with your child, it will increase the opportunity for disclosure, increase their understanding of online safety, and establish groundings in what constitutes positive and negative behaviour. As per the research findings from the focus group sessions, children actively voiced the desire for behaviour modelling opportunities. Whereby, they were provided with some form of guidance on how to behave in online environments. This could take the form of training provisions and bot features facilitated by tech companies within their programmes, but it can also be provided through conversations with your child. It is common for people, adult or child, to experience some form of online disinhibition and dissociation between our actions online and how we behave offline (Suler, 2004). It is important to remind children that how we behave online has an impact on real people's feelings, to emphasise impact and accountability for online behaviour.

Regulation of online purchases

Many of the online 2D and 3D Metaverse games used by children have, as a part of their design feature, the opportunity to earn, spend and purchase items. Items that can include game passes to new levels, clothing, weapons and what is known as 'skins'. These game features are incredibly alluring to children as they have the desire to build their identity and keep up with social trends in this online world. Social identity is incredibly important to children, especially in the Metaverse where children can become whoever they want to be. The pressures and the excitement of making online purchases

can occur relatively undetected in comparison to offline spending. This lack of regulation increases the risk of children overspending. Parents and carers should identify what spending restriction settings are available and apply them.

5.4 General Guidance

These guidelines and measures are intended to create a safe and secure environment for all users in the Metaverse, with a special emphasis on ensuring children can enjoy these spaces safely. The aim of these guidelines is to promote responsible engagement and protect the well-being of individuals, especially children and young people.

Key Principles:

- **Safety and Well-being:** Design must prioritise the safety, privacy, and emotional well-being of all users, particularly minors.
- **Inclusivity and Diversity**: Foster an inclusive and diverse virtual community, free from offensive behaviour.
- **Education and Awareness**: Promote digital literacy, online safety education, and awareness initiatives to empower users to make informed decisions and navigate virtual environments responsibly. This includes integrating Metaverse safety into educational online safety resources for schools as well as in-platform.
- **Collaboration and Partnerships**: Work collaboratively with stakeholders, industry partners, law enforcement agencies, and child protection organisations to develop effective strategies and tools for mitigating risks and promoting safety within the Metaverse. This involves widespread awareness campaigns and including metaverse training in police force training programmes.
- **Parental Controls**: Work more proactively with parents to ensure that they are aware of and able to use parental controls and provide comprehensive parental control tools that enable caregivers to monitor and manage their children's activities, limit screen time, and restrict access to sensitive content.

VIRRAC'S EVIDENCE-LED TOOLS FOR SAFETY IN THE METAVERSE

Evidence-led tools have been developed by the VIRRAC Team specifically for use by educational institutions, frontline practitioners, industry, parents and caregivers, and children and young people.

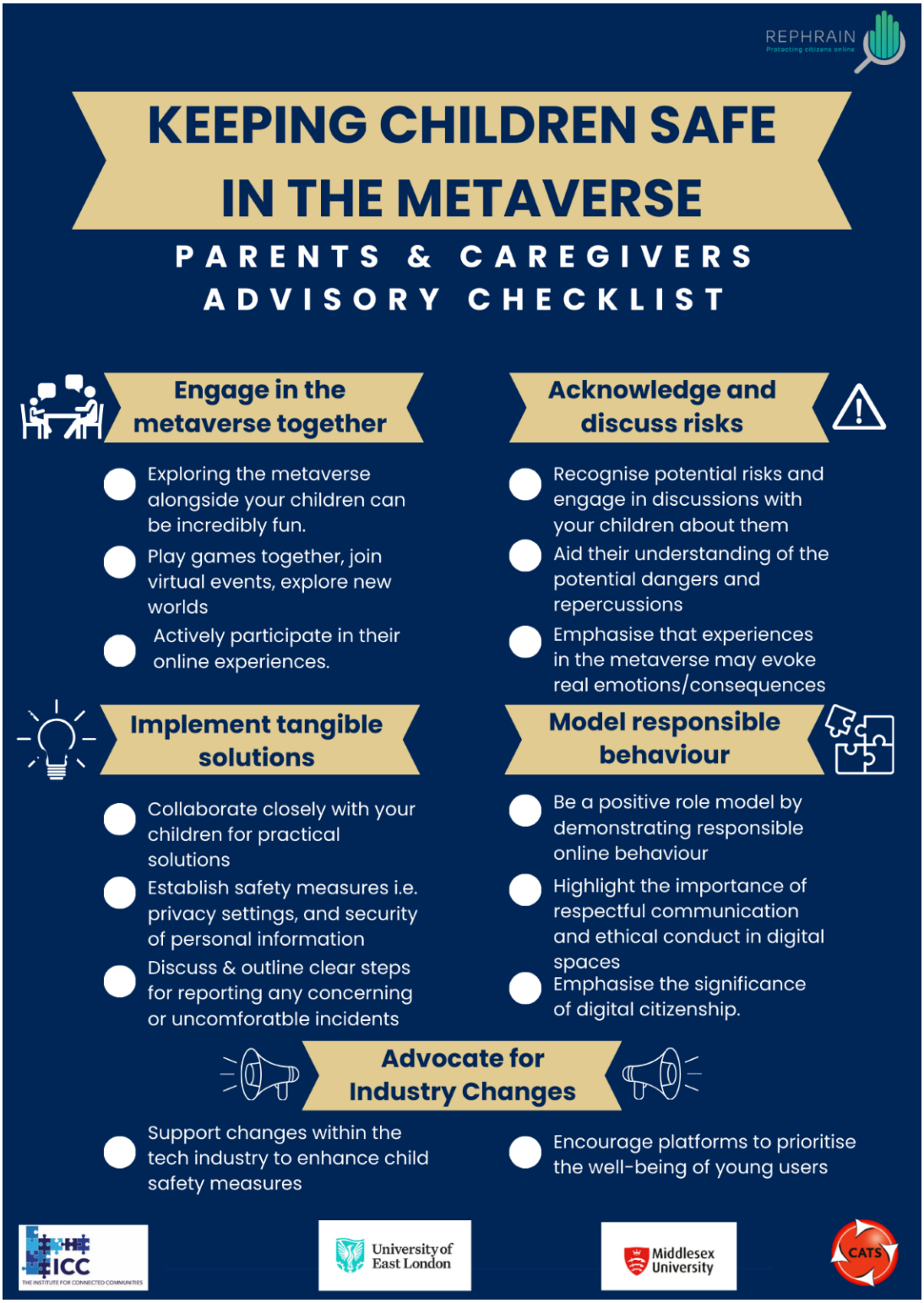
Based on the research conducted within the VIRRAC project, the following evidence-led tools for practical use have been produced as an introductory sample of what is to come in the full VIRRAC Toolkit that the team anticipates completing in the continuation of their work focusing on safeguarding children in the Metaverse. The VIRRAC tools include a series of posters sharing the key messages regarding online safety for parents, children (both primary and secondary), and teachers. There are many iterations of general online safety 'checklists' for children and adults to use help them to stay safe online, but very few tools are available that are Metaverse specific. The checklist tool

(TOOL 1) is an evidence-led checklist for parents and caregivers to use to support them in keeping children safe in the Metaverse. As stated in the Executive Summary and Recommendations sections of this Report, a safety by design approach is vital to safeguarding children and young people in the Metaverse. The industry checklist tool (TOOL 4) has been developed by the VIRRAC team. It is a quick to use summary to aid platform and game developers in adopting a safety by design approach to new Metaverse features and future updates.

The VIRRAC team has also worked closely with a stakeholder board member, Nina Jane Patel (KABUNI) to produce a series of 5 short video reels that tackle emerging themes and topics of concern in child safety in the metaverse. These videos are unique as they have been created using the adapted experiences, perspectives and solutions that children and young people shared during the VIRRAC focus groups.

The following tools have been developed by the VIRRAC team.

- ✓ TOOL 1: Parent and Caregiver Checklist
- ✓ TOOL 2: Metaverse Safety Poster for Teenagers
- ✓ TOOL 3: Metaverse Safety Poster for Children
- ✓ TOOL 4: Metaverse Safety Industry: Safety by Design Checklist
- ✓ TOOL 5: Metaverse Safety Poster for Schools
- ✓ TOOL 6: VIRRAC Film Resource for 8-12 Year Olds


REPHRAIN
KEEPING CHILDREN SAFE IN THE METAVERSE
PARENTS & CAREGIVERS ADVISORY CHECKLIST
Engage in the metaverse together
Exploring the metaverse alongside your children can be incredibly fun.
Play games together, join virtual events, explore new worlds
Actively participate in their online experiences.
Acknowledge and discuss risks
Recognise potential risks and engage in discussions with your children about them
Aid their understanding of the potential dangers and repercussions
Emphasise that experiences in the metaverse may evoke real emotions/consequences
Implement tangible solutions
Collaborate closely with your children for practical solutions
Establish safety measures i.e. privacy settings, and security of personal information
Discuss & outline clear steps for reporting any concerning or uncomforatble incidents
Model responsible behaviour
Be a positive role model by demonstrating responsible online behaviour
Highlight the importance of respectful communication and ethical conduct in digital spaces
Emphasise the significance of digital citizenship.
Advocate for Industry Changes
Support changes within the tech industry to enhance child safety measures
Encourage platforms to prioritise the well-being of young users
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TEEN GUIDE
METAVERSE SAFETY
SAFE SPACES
Where you choose to use your headset has a big impact on your experience. Being around family and friends can increase your sense of safety and prevent reality confusion.
SAFETY SETTINGS
The restrictive settings on your device can help you to stay away from harmful experiences and avoid content made for adults that might affect your wellbeing.
YOUR BEHAVIOUR
It is not always clear what the rules are in every game. It is important to always be kind to others. Whilst the game is not real, feelings and emotions are.
HATE & HARASSMENT
Hate speech and harassment is often experienced by metaverse users. You have the right to enjoy the metaverse without abuse. Always report toxic behaviour in the apps and inform an adult.
REPORTING
It is always important to learn about the safety features in an app. Such as reporting, blocking and silencing other players. Being aware of how to do this increases your safety and enjoyment
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KIDS POSTER
METAVERSE
SAFETY
SAFE SPACES
Make sure you use your headset in a big open space that is safe, clear from toys so you don't trip over. It is best to play with family or friends near so you can always remember what is real and what is not.
AGE OK?
Some online games are only made for grown ups. Check with an adult to make sure you are playing the right game and have the right age in your profile.
SAY NO TO INFO
Never share personal information about yourself, such as you name, age, where you live or go to school. This information is private and should be kept secret from people online.
TOXIC PLAY
People can say things online that hurt our feelings even after we have finished the game. It is important to be nice and respectful to others, but make sure you tell a grown up when something makes you sad.
BLOCK OR REPORT
Make sure you know how to report bad behaviour in the games you play. Always check with a grown up to make sure you have the best safety settings to give you the best play time.
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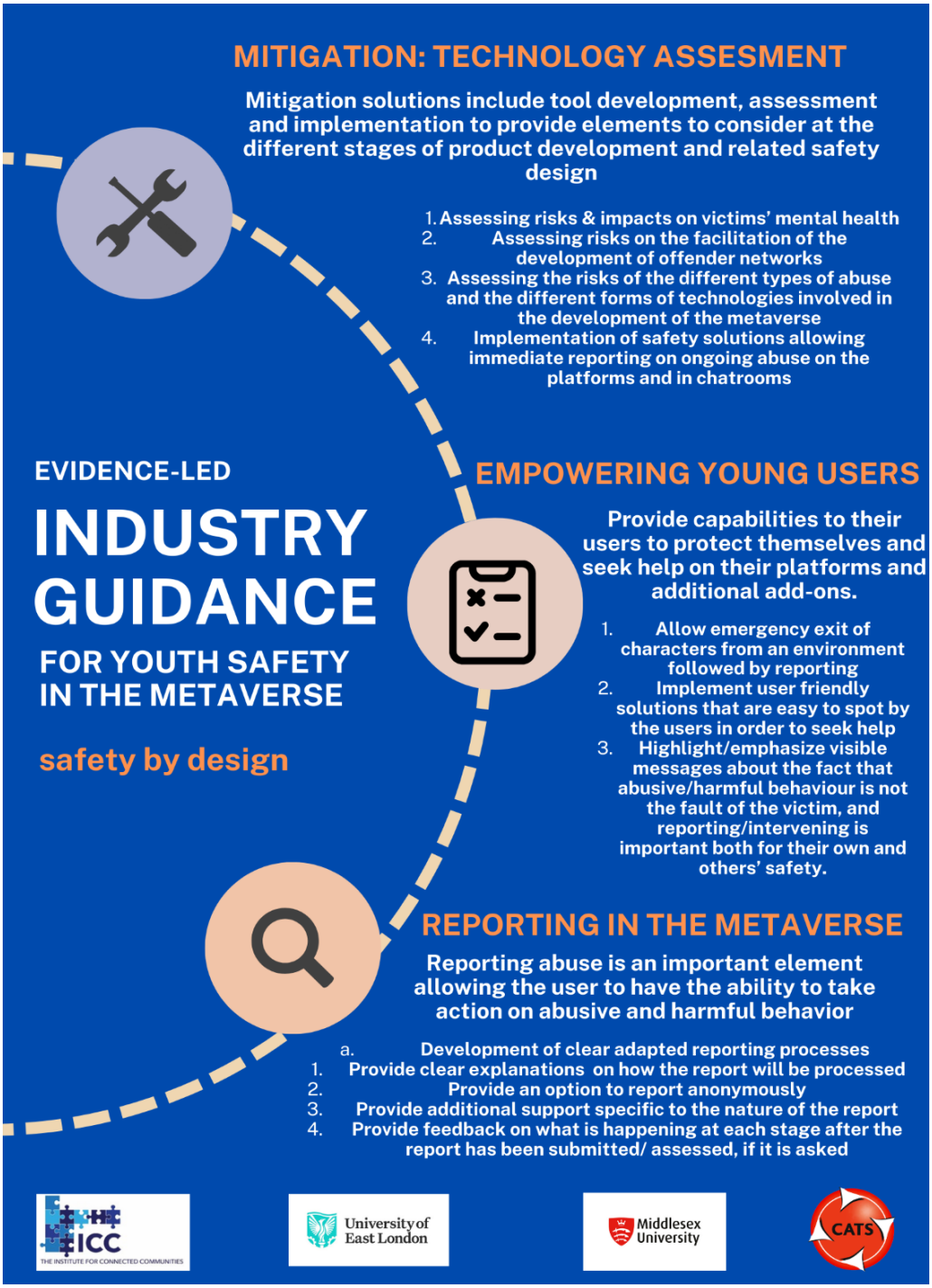
MITIGATION: TECHNOLOGY ASSESMENT
Mitigation solutions include tool development, assessment and implementation to provide elements to consider at the different stages of product development and related safety design
1. Assessing risks & impacts on victims' mental health
2. Assessing risks on the facilitation of the development of offender networks
3. Assessing the risks of the different types of abuse and the different forms of technologies involved in the development of the metaverse
4. Implementation of safety solutions allowing immediate reporting on ongoing abuse on the platforms and in chatrooms
EVIDENCE-LED
INDUSTRY GUIDANCE
FOR YOUTH SAFETY IN THE METAVERSE
safety by design
EMPOWERING YOUNG USERS
Provide capabilities to their users to protect themselves and seek help on their platforms and additional add-ons.
1. Allow emergency exit of characters from an environment followed by reporting
2. Implement user friendly solutions that are easy to spot by the users in order to seek help
3. Highlight/emphasize visible messages about the fact that abusive/harmful behaviour is not the fault of the victim, and reporting/intervening is important both for their own and others' safety.
REPORTING IN THE METAVERSE
Reporting abuse is an important element allowing the user to have the ability to take action on abusive and harmful behavior
a. Development of clear adapted reporting processes
1. Provide clear explanations on how the report will be processed
2. Provide an option to report anonymously
3. Provide additional support specific to the nature of the report
4. Provide feedback on what is happening at each stage after the report has been submitted/ assessed, if it is asked
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TEACHER'S GUIDE

METAVERSE

The metaverse provides an incredible opportunity for positive developmental growth for children, socially, emotionally and educationally. The metaverse is a virtual reality environment that allows children to interact with virtual worlds on their own or engage with others from anywhere in the world using a virtual reality headset.

BEHAVIOUR MODELING

Children want and need clear guidance on how to behave in the metaverse. It is important that children understand that how they behave online has an impact on the wellbeing of other users and themselves. Introduce topics of behaviour modelling to give examples of positive and negative behaviours.

ABUSIVE BEHAVIOUR

All children risk witnessing abusive behaviour in online games regardless of age. Children need to know what abusive behaviour, including hate crime, looks like and be encouraged to share that information with a grown up and learn how to report abusive behaviours online.

PRIVACY

Children need clear guidance about sharing personal information. This information will not only be sought by children but by predatory adults too. Children should not provide their names, addresses or school. They should never share phone numbers or agree to move conversations to private chat apps or share selfies.

SAFETY EDUCATION

In alignment with KSCIE statutory guidance, schools need to imbed online safety across the school at a regular occurrence. Metaverse safety can be introduced through PSHE lessons, assemblies and Safer Internet Week. Though opportunities should not be limited to these occasions as disclosures of harmful experiences increase after such sessions.

CITIZENSHIP

Citizenship amongst children is important to encourage both in the online and offline world. Children who are being bullied in the metaverse may not report what they are experiencing, but other children playing alongside can. Children should be actively encouraged to aid in the reporting of others if they see or heard harmful behaviour.

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VIRRAC Video Resource for Children (8-12 years)

A series of five short videos that can be used by frontline practitioners and parents to support child safety in the Metaverse. These videos have been designed for young children, 8–12-year-olds. There are currently no videos available for this age-group that focuses on safety in the Metaverse, and so it is hoped that this video resource will be utilised and fill a needed gap in digital safety resources for children. This video series is an evidence-led, accessible, light-hearted but educational resource for raising awareness and top-tips for young people to stay safe in the Metaverse. The videos can be viewed separately or shown together. The reason for this decision aligns to the target audience of young people, as well as the dissemination plan of utilising social media platforms for dissemination with short 'reel-like' video formats. Key messaging has been categorized into 5 main messages, corresponding to the 5 short video reels. These 5 key messages are derived from the literature, the expertise of the team, as well as evidence led findings taken from empirical research conducted within the VIRRAC project, including insights from the expert Roundtable and from the youth Focus groups.

- ✓ **Video 1: Exploring the Metaverse through young eyes**
- ✓ **Video 2: Physical and digital safety**
- ✓ **Video 3: Being responsible and respectful in the metaverse**
- ✓ **Video 4: Navigating difficult behaviours**
- ✓ **Video 5: Responding to uncomfortable situations in the Metaverse (signposting)**

Adapted quotes from the research are used within the video content. These videos were disseminated on Safer Internet Day 2024, and via the VIRRAC stakeholder board members, including Childnet and KABUNI.

Access the full VIRRAC video resource for 8–12-year-olds here Safer Internet Day - YouTube