MANUAL

Be Internet Awesome For All

Developing digital citizenship in children with various educational needs

School with Class Foundation

Be Internet Awesome

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Developing digital citizenship in children with various educational needs

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Contents

Introduction

Considerations of how information and communication technologies (ICT) translate into the functioning and mental health and well-being of young people have been strongly present in the scientific literature for more than two decades. There are regular research projects that are geared toward both exploring the risks and risky behaviors online and (to a lesser extent) the opportunities and potential benefits of technology use by young people.

Historically, the way we think about these issues has evolved. Initially, technology and new media were treated almost exclusively as a threat that could harm socially and psychologically representatives of the new generation in many ways. It can be said that such an approach was within a way of thinking that can be called the **risk paradigm**. In this view, the task of adults and media education in the broadest sense is to protect and warn against risks.

The take that came later can be called **the opportunity paradigm**. Here the focus is not on the risks, but on the opportunities associated with the use of technology in both developmental and social contexts.

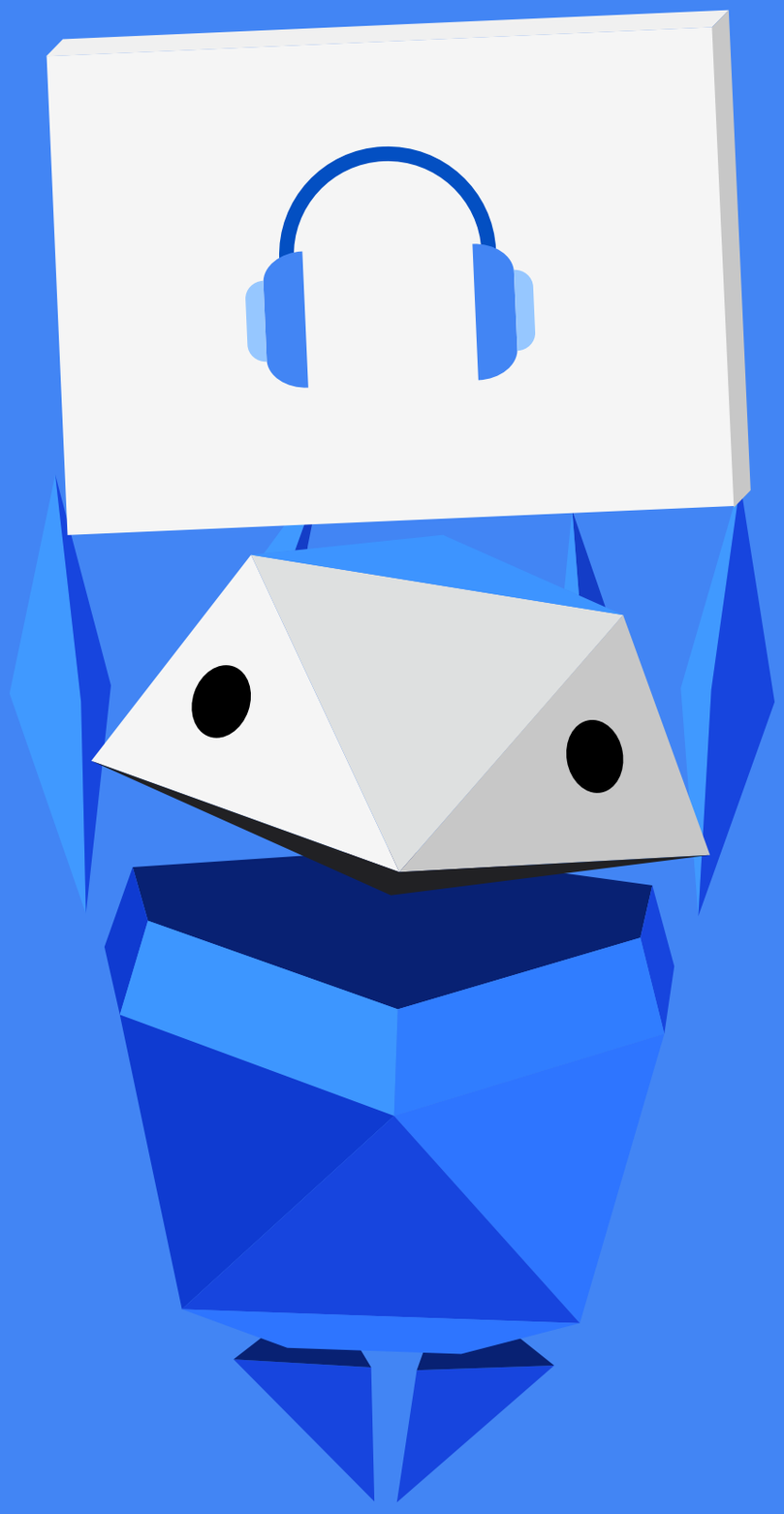
Clearly, both approaches contain some truth, and actually direct our thinking to more specific and interesting issues. These include, for example, questions about why, although technologies can potentially have a very positive or negative impact on the functioning and well-being of young people, they actually affect everyone differently. On what individual and social factors does this impact depend? And finally, from a practical point of view – how should we act to build conditions for responsible and creative use of technology?

Such considerations take on particular importance in the case of groups that are sometimes defined as vulnerable, including children with different individual educational needs. In the case of this group, we often have to deal with the specificities of cognitive, emotional and social functioning, but also the life experiences associated with these issues, which in many cases are difficult and unfavorable. When we integrate technologies into the landscape of functioning of such children, we can, on the one hand, count on certain specific benefits, where, thanks to technologies, certain needs of children from this group will be met and the use of technologies will support their development. On the other hand, children from these groups may experience specific risks associated with the use of technology.

It is these issues that we have looked at for selected, but not all, groups of young people from potentially disadvantaged groups. In this issue, we decided to include chapters on children on the autism spectrum, children with chronic illnesses, children with visual impairments, children with emotional and behavioral difficulties, children with intellectual disabilities, and young people with migration experiences.

In each chapter, the authors focus on a synthetic characterization of the group in question. They then turn to the specific opportunities and risks associated with the use of technology, with a particular focus on the Internet. This is followed by detailed recommendations, based on diagnostic scientific studies, on the specifics of media education. The chapters conclude with brief analyses of recent trends in the use of technology with children from a specific group, and, where possible, information on how the time of crisis remote education during the COVID-19 pandemic modified the use of technology by young people from a specific group.

We tried to make our considerations as well documented and as practical and applicable as possible for teachers working with male and female students from all groups. Our work has clearly shown that there are still many gaps in the research findings on the use and impact of technology on young people from disadvantaged groups. Despite this, our findings translate into meaningful assumptions for media education tailored to their specificities. However, such work is certainly needed, and we believe that this publication is part of the trend of individualizing media and digital education.



Children on the Autism Spectrum and ICT

Philippe Brunet et al.

School with Class Foundation

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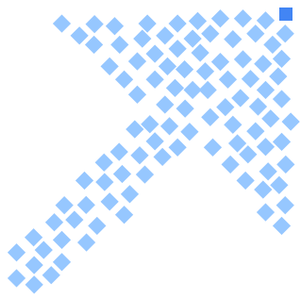
1 What is the Autism Spectrum?

Autism Spectrum Disorder is a neurodevelopmental disorder characterized by restricted, repetitive behaviours (RRBs) and persistent difficulties in communication and social interactions (American Psychiatric Association [APA], 2022). The autism spectrum is often associated with difficulties in language, theory-of-mind (i.e., adopting another person's perspective), attention, executive functions (i.e., cognitive processes related to daily activities and pursuing goals) and central coherence (i.e., seeing the 'big picture'). These difficulties contribute to the severity of the social and communication challenges experienced by individuals on the autism spectrum (APA, 2022; Petrina et al., 2014).

Global estimates suggest that Autism Spectrum Disorder occurs in approximately one percent of the population, with males accounting for about 80% of diagnoses (Fombonne et al., 2021; Zeidan et al., 2022). However, the diagnoses are increasing, and educators need to be equipped with the knowledge and tools to support neurodiverse students (Skafle et al., 2020; Tsiopela & Jimoyiannis, 2017). This chapter explores the common social experiences and academic needs of autistic students. Specifically, we consider the role of information and communication technologies (ICTs) in supporting neurodiverse students.

Individuals on the autism spectrum differ widely from one another due to their age, gender, the intensity of autistic traits, co-occurring conditions (e.g., the presence of mental health issues such as depression), and intelligence levels (APA, 2022; Grossard et al., 2018; Van Eylen et al., 2015). Nevertheless, all autistic individuals demonstrate social and communication challenges. Specifically, many children on the autism spectrum face difficulties initiating and maintaining conversations, sharing emotions, and playing cooperatively with their peers (APA, 2022). Furthermore, autistic children often have trouble interpreting and expressing verbal, nonverbal (e.g., gestures;) and paralinguistic (e.g., tone of voice) social cues and engaging in appropriate social and communication behaviours (e.g., waiting their turn andmaintaining eye contact; APA, 2022; Geelhand et al., 2021).



Estimates suggest that Autism Spectrum occurs in approximately 1% of the population and the diagnoses are increasing.

School Experiences of Children and Adolescents with ASD

Children and adolescents on the autism spectrum often have unique school experiences and needs influenced partly by their traits (Adams et al., 2020; Rowley et al., 2012). For example, the social complexities associated with frequently changing classrooms and instructors throughout the day may be especially stressful for autistic students (Aubineau & Blicharska, 2020). Moreover, behavioural differences related to the autism spectrum (e.g., atypical interests and behaviours) can elicit negative responses from peers and challenge positive peer relationships (Adams et al., 2020; Rowley et al., 2012). In fact, many autistic students report experiencing negative peer interactions (e.g., teasing or bullying) and increased rates of social isolation compared to non-autistic children (Dillon et al., 2016; Rowley et al., 2012). Crucially, negative peer interactions contribute to feelings of loneliness and present an increased risk of anxiety, depression, academic underachievement (i.e., poor grades), school refusal, and poor quality of life among young people on the autism spectrum (Adams et al., 2020; Bellini et al., 2007; Dechsling et al., 2021; Rowley et al., 2012; Skafle et al., 2020).

The social complexities associated with frequently changing classrooms and instructors throughout the day may be especially stressful for autistic students.

Social & Communication Challenges

Socialization and communication often present obstacles for autistic individuals seeking to establish and maintain friendships (APA, 2022). Specifically, challenges with forming friendships may be partially attributable to the fact that many individuals on the autism spectrum struggle to (i) initiate social interactions and play, (ii) respond to other's social attempts, and (iii) interpret and express social cues (Jellema et al., 2009; Mendelson et al., 2016; Rowley et al., 2012). Furthermore, autistic individuals often have different interests and play preferences than non-autistic people (Dominguez et al., 2006). Research shows that individuals on the autism spectrum and with associated social-communication difficulties tend to have fewer meaningful friendships than their non-autistic peers (Adams et al., 2020; Rowley et al., 2012). Students and teachers report that only about 50% of students on the autism spectrum have at least one close friend (Rowley et al., 2012). In addition, 40% of autistic students report feeling excluded and rejected at school (Rowley et al., 2012). Moreover, friendships tend to feel less secure, intimate and supportive for those on the autism spectrum (Macoun et al., 2021).

Social & Communication Difficulties in Individuals on the Autism Spectrum

- → initiating social interactions and play
- → responding to other's social attempts
- → interpreting and expressing social cues

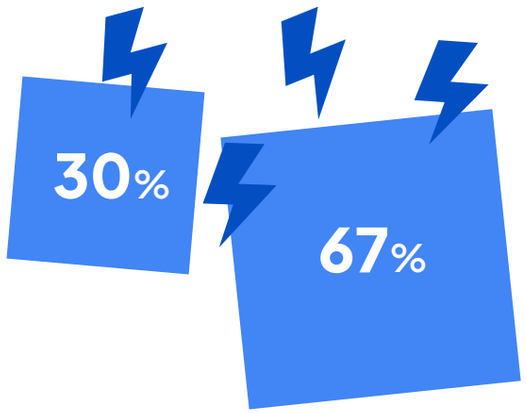
As many as **50**% students on the autism spectrum do not have close friends

As a result, autistic individuals tend to have fewer mutually satisfying relationships and smaller social support networks (Macoun et al., 2021). Crucially, these persistent social difficulties lead to a heightened risk of mental health problems in adulthood (Moss et al., 2015).

Despite the social and communication challenges discussed above, many individuals on the autism spectrum crave friendship and social interaction (White et al., 2006; 2009). Indeed, stronger social support networks have been shown to improve self-worth and mental health and reduce feelings of loneliness among autistic individuals (Bauminger et al., 2003; Mazurek & Kanne, 2010). In light of this and the fact that engaging with friends helps to develop social skills, educators may wish to facilitate friendships and reduce social discomfort for students on the autism spectrum (Rowley et al., 2012). Therefore, to promote social bonds, educators may wish to monitor social interactions and provide social skills training for autistic students.

In addition to difficulties with forming friendships, research indicates that students on the autism spectrum are 2.4 times more likely to be the target of bullying than non-autistic children, with a prevalence of 67% (Park et al., 2020), compared to the overall childhood/adolescent prevalence estimates of bullying, which are approximately 30% (Modecki et al., 2014). In fact, autistic students who demonstrate pronounced social and communication difficulties are especially vulnerable to bullying (Park et al., 2020). Specifically, those with more severe social problems tend to display a higher intensity of autistic traits overall and, as a result, are more visible targets for bullying (Holfeld et al., 2019). For example, autistic children and adolescents are often singled out for their uncommon interests and behaviours or for their difficulties reading non-verbal behaviour (e.g., gestures and facial expressions) and interpreting language (Rowley et al., 2012).

Interestingly, some research suggests that students with minor social difficulties are more likely to be bullied than those with severe social difficulties (Rowley et al., 2012). However, despite experiencing increased bullying, students with minor social difficulties have more mutual friendships than those with severe social difficulties (Rowley et al., 2012). These findings could be explained by the fact that students with less severe difficulties may engage in more social activities and, thus, be more exposed to bullying. In contrast, students with significant social difficulties tend to isolate themselves (Rowley et al., 2012).



Students on the autism spectrum are

2.4 times more

likely to be the target of bullying than non-autistic children

Educational Support for Autistic Young People

Educators can play a crucial role in reducing bullying among students on the autism spectrum, especially in inclusive school settings where these students are in constant contact with non-autistic peers (Beckman et al., 2020; Park et al., 2020). Specifically, educators can reduce the likelihood of bullying by promoting neurodiversity awareness among students (e.g., by providing lessons on the strengths and needs of individuals on the autism spectrum), closely supervising students on the autism spectrum and firmly disciplining all acts of bullying (Park et al., 2020). These initiatives are especially important considering that bullying among autistic individuals can carry long-term psychological, social and health consequences (Beckman et al., 2020; Park et al., 2020; Wolke & Lereya, 2015).

Educators can also play a vital role in the social development of children on the autism spectrum. For example, educators can teach and practice important social skills through role-playing scenarios. That said, studies examining educational interventions targeting social skills for autistic students often yield inconsistent results (Ostryn & Mincic, 2022). In this regard, information and communication technologies (ICTs) are interesting tools to supplement traditional educational practices. ICTs encompass various tools providing digital access to information and socialization opportunities (Macoun et al., 2021). For example, ICTs include computers, smartphones, tablets, video game consoles and many programs and applications accessed through these devices (e.g., video-conferencing tools, social media applications and internet search engines). Researchers and practitioners are increasingly leveraging ICTs with the aim of improving social and emotional skills among autistic children. For example, robotics, virtual reality devices and computer-based interventions show early promise for improving social and emotional skills (Dechsling et al., 2021; Grossard et al., 2018; Ramdoss et al., 2012). Furthermore, certain home-delivered ICT interventions allow parents to get involved in their children's education (Heath et al., 2015).

Ways to Support Autistic Youth in a School Setting

- → promoting neurodiversity awareness among students (e.g. lessons on the strengths and needs of individuals on the autism spectrum)
- → closely supervising students on the autism spectrum and firmly disciplining all acts of bullying
- → teaching and practicing important social skills through role-playing scenarios

Leveraging ICTs to Support the Development of Social Skills in Students on the Autism Spectrum

If your students have difficulties expressing their emotions, defining social relations and rules, establishing positive relationships with peers and fitting into the social environment, you should bear in mind that modern technologies offer increasingly interesting solutions to support the development of autistic students.

Tablets play an integral part during my in-class lessons, where they are used to shape specific skills and plan a child's activities during social skills training.

'Autimo' and 'Expressions for Autism' are examples of two interesting **applications** that you can successfully use with your students.

Moreover, you can source engaging student exercises from **platforms** such as:

- → Learningapps
- → Word Wall
- → Bamboozle
- → Educandy
- → Avatar Maker

Zyta Czechowska – Therapist and Special Education Teacher, Be Internet Awesome Trainer

ICTs are also playing an increasingly important role in the classroom. Educational ICTs include smart whiteboards, computers and tablets with or without internet access (Area-Moreira et al., 2016). Specifically, students can use personal computers with internet access for research, problem-solving, writing and communication (Area-Moreira et al., 2016). In special education classrooms, ICTs are most commonly used to deliver web-based instructions and applied games (i.e., educational games; Liu et al., 2013). Notably, students and teachers report that learning is easier, more enjoyable and more effective in classrooms equipped with ICTs (Liu et al., 2013). Moreover, school-delivered computer-assisted interventions can be used to teach autistic students social problem-solving and social skills (Sansosti et al., 2015). Indeed, ICTs may be socially appealing to individuals on the autism spectrum, given that they often find face-to-face interactions difficult and anxiety-provoking (Macoun et al., 2021).

2 Students on the Autism Spectrum and the Internet

Outside the classroom, social networking sites, blogs and instant messaging services offer a promising communication bridge between autistic and non-autistic individuals. Indeed, ICTs eliminate nonverbal and paralinguistic cues such as facial expressions and tone of voice and provide a structured format for communication (Burke et al., 2010). Children on the autism spectrum who use social networking sites report improved relationships (Mazurek et al., 2012). However, autistic individuals around the globe primarily use the internet for non-social purposes, such as playing single-player games and watching television (Mazurek et al., 2012; Ntalindwa et al., 2019). As a matter of fact, many individuals on the autism spectrum report disliking social media sites (e.g., Facebook) and experience them as confusing and boring (Bahiss et al., 2010). It appears that autistic individuals prefer communicating with others when pursuing common goals or performing activities (Bahiss et al., 2010). In light of this, educators using ICTs to provide social support to students on the autism spectrum must account for their students' motivation levels. For example, students may prefer ICTs that are packaged or 'disguised' as video games (Macoun et al., 2021).

Autistic individuals around the globe primarily use the internet for non-social purposes, such as playing single-player games and watching television. As a matter of fact, many individuals on the autism spectrum report disliking social media sites and experience them as confusing and boring.

3 Risks and Opportunities

Beyond the current application of smart whiteboards, computers and tablets for instruction delivery, educators might consider leveraging ICTs to support social skills among students on the autism spectrum. However, educators using ICTs to promote socialization should be mindful of the risks and opportunities associated with these technologies, especially when working with students with complex learning needs and unique abilities. Indeed, despite the promise of ICTs to support social skills, autistic students might be negatively impacted by certain properties of technology.

Specific Risks

Expanding beyond the current application of ICTs to promote social skills among students on the autism spectrum does carrysome risks. Despite the importance of motivating students, increasing the rewarding properties of ICTs may be a ‘double-edged sword’ given the risk of problematic technology use (MacMullin et al., 2016). Problematic technology use can be defined as use that either (i) persists despite intentions to stop, (ii) leads to frequent and intrusive thoughts related to technology, or (iii) causes personal or interpersonal conflict (MacMullin et al., 2016).

As a group, individuals on the autism spectrum are especially vulnerable to problematic technology use, such as compulsive video game use (Craig et al., 2021). Thus, further introducing technology into the lives of students on the autism spectrum may have negative consequences. Some educators are concerned that technology could interfere with other aspects of learning (Bauer, Kenton, 2005). For example, teachers may find it challenging to shift autistic students away from ICTs to other learning activities. Hence, educators must balance motivating their students with teaching them how to limit their internet use. This balance can be facilitated through the active mediation of technology, which has been discussed below.

Furthermore, the benefits of ICTs for individuals on the autism spectrum may not translate to real-world social interactions and may even hinder the development of adaptive compensatory behaviours (i.e., limiting the development of strategies to overcome social challenges; Grossard et al., 2018; Macoun et al., 2021). Specifically, an overreliance on ICTs for socialization may impede social development by limiting real-life interactions (Macoun et al., 2021; Ong et al., 2011). For example, over-reliance on ICTs can limit the time autistic children spendwith friends and in healthy activities such as exercise and reading (Macoun et al., 2021). Crucially, overuse of ICTs is related to academic underachievement, poor social engagement, behavioural issues and health issues among individuals on the autism spectrum (Mazurek et al., 2012).

Moreover, autistic individuals may be particularly vulnerable to cyberbullying (i.e., online bullying; Iglesias et al., 2019). Some studies report that up to 41% of children on the autism spectrum who are online experience cyberbullying (Beckman et al., 2020). These rates are much higher than the estimates of cyberbullying among the general adolescent population (about 15%; Modecki et al., 2014). It appears that certain properties of ICTs may increase the risk and impact of cyberbullying for autistic individuals. For one, individuals on the autism spectrum may display social and communication difficulties in online mediums, making them visible targets for cyberbullying (Macoun et al., 2021). For instance, text-based messages transmitted via ICTs are more likely to be misinterpreted and perceived as aggressive than real-life communications (Runions et al., 2013). This threat is augmented by the fact that some autistic individuals report feeling confused about how to use ICTs, thus making them more likely to disclose private information online (Benford & Standen, 2009). Second, the anonymous nature of many ICT interactions may appeal to bullies, increasing the prevalence of cyberbullying in general. Third, despite the absence of physical violence, cyberbullying is severely distressing due to the permanence of messages and potentially large audiences (Runions et al., 2013).

In short, the misuse and overuse of ICTs, their potential failure to generalize to real-world scenarios, and the high rates of cyberbullying represent serious risks for students on the autism spectrum. Crucially, cyberbullying, perceived social risks, and uncertainties about how to properly use ICTs lead to an increased risk of mental health challenges among autistic individuals (e.g., anxiety, depression, and lower self-esteem; Iglesias et al., 2019; Macoun et al., 2021). Nevertheless, these technologies may be promising tools to support students on the autism spectrum when properly implemented.

Key Risks

- → problematic technology use (e.g. compulsive video game use)
- → threats resulting from autistic people being especially vulnerable to cyberbullying
- → difficulties in shifting autistic students away from ICTs to other learning activities
- → challenges to translate skills developed with use of ICT to real-world social interactions
- → overreliance on ICTs for socialization may impede social development by limiting real-life interactions

Specific Opportunities

Despite the risks, ICTs offer numerous potential benefits for social development in students on the autism spectrum. For example, ICTs can increase the accessibility of interventions and reach autistic individuals living in rural and remote communities (Parsons et al., 2019). ICTs can also bring together individuals with common interests, thus strengthening one's social network and promoting the positive effects related to social support (Macoun et al., 2021). For instance, research shows that social connection enhances self-esteem, well-being and happiness and reduces loneliness and mental health challenges among autistic individuals (Macoun et al., 2021). Furthermore, ICTs may offer additional social benefits, such as strengthening existing friendships and increasing social engagement (Macoun et al., 2021). Crucially, these social benefits may help reduce the negative effects related to social communication challenges common with the autism spectrum.

Four aspects unique to online communication may be especially beneficial for individuals on the autism spectrum (Macoun et al., 2021; Runions et al., 2013):

- First, ICTs may help with **communication between autistic and non-autistic individuals** by eliminating nonverbal cues such as body language, facial expressions, and voice inflections (Macoun et al., 2021). Moreover, emoticons (e.g., a smiley face) provide clear emotional cues that can be valuable in guiding emotional understanding and self-expression, especially given the proliferation of online guides to interpreting emoticons (e.g., emojipedia.org). Indeed, individuals on the autism spectrum report feeling less stressed during online communication than in real-life conversations (van der Aa et al., 2016).

- Second, **the normal delay between messages in online conversations matches the communication preferences of autistic individuals** (Macoun et al., 2021). ICTs make turn-taking during conversation easier and allow individuals on the autism spectrum to take their time before responding to messages.

- Third, though **the permanence of messages** in ICTs poses a risk, **it may also provide benefits by providing autistic individuals with the opportunity to review and learn** from prior social interactions or seek real-time guidance (Macoun et al., 2021).

- Finally, ICTs offer opportunities to **practice group conversations** (Macoun et al., 2021). Take, for example, a discussion in the comments section of your favourite social media platform. Although large online audiences can present a risk of cyberbullying, these group interactions may help individuals on the autism spectrum feel that they are part of a community. Moreover, successfully engaging in large group discussions via ICTs may increase feelings of self-efficacy in autistic individuals.

Notably, when used for social purposes, ICTs may promote the inclusion of students on the autism spectrum into the broader school community (Hersh et al., 2020). For example, higher education courses frequently utilize online discussion forums, which could help translate the benefits of ICTs into tangible academic and social gains for autistic students. Furthermore, for elementary and high school students on the autism spectrum, ICTs can provide continuity between the school and home environments and promote the involvement of parents or caregivers (Heath et al., 2015).

In the classroom, computer-assisted instruction (CAI) appears to be a promising method for teaching certain academic skills to students on the autism spectrum (Pennington, 2010). For example, computers and digital programs (i.e., ICTs) reduce potentially confusing social interactions and allow autistic students to focus on the relevant material (Pennington, 2010). Indeed, ICTs can promote social understanding among students on the autism spectrum by highlighting, repeating and slowing down important social cues (e.g., through video modelling; Pennington, 2010). Additionally, ICTs allow educators to pre-record instructions, which can be captioned, paused, replayed and slowed down for students struggling with understanding. ICTs also allow educators to supplement instructions with relevant audio-visual materials, which is crucial when working with autistic individuals (Pennington, 2010). Students on the autism spectrum report that instructions with audio-visual support are more reinforcing and motivating than traditional methods (Pennington, 2010). These students also exhibit lower rates of inappropriate behaviour when receiving CAI compared to conventional instruction methods.

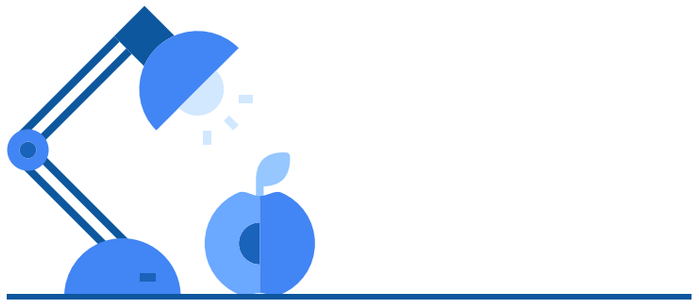
ICTs allow educators to pre-record instructions, which can be captioned, paused, replayed and slowed down for students struggling with understanding.

Students on the autism spectrum report that instructions with audio-visual support are more reinforcing and motivating than traditional methods.

In short, for autistic students, CAI and associated software appear more effective, efficient and engaging than traditional instructional methods (Pennington, 2010). Nevertheless, the current weight of evidence is insufficient to coin ICTs and CAI as evidence-based practice (Pennington, 2010; Ramdoss et al., 2012). More research needs to be done to understand the specific risks and benefits associated with ICT use among students on the autism spectrum.

4 Recommendations

Given their unique strengths and needs, a personalized approach to education and intervention is essential for students on the autism spectrum. Educators should be aware of the benefits and risks specific to the autistic population and to each individual on the autism spectrum. The school setting provides students with unique opportunities to develop social skills, expand social networks and build communication skills. Educators can support autistic students by facilitating collaborative play and friendships and by reducing social discomfort. Moreover, educators are tasked with reducing bullying, especially among students on the autism spectrum, given that they are particularly vulnerable. With this in mind, four practical applications to guide the use of ICTs among autistic students have been offered below (Macoun et al., 2021).



Given their unique strengths and needs, a personalized approach to education and intervention is essential for students on the autism spectrum.

- First, educators may wish to leverage the benefits of ICTs to **promote the development of social skills among students on the autism spectrum**. Since autistic students typically use ICTs for individual activities, educators need to devise creative ways to use these tools for social purposes (Mazurek et al., 2012). For example, multiplayer educational games may motivate students and be socially conducive.

- Second, given the unique strengths and needs of individuals on the autism spectrum, members of this population should be **educated on the specific opportunities and risks associated with ICT use**. For example, autistic students should be aware of the dangers of problematic technology use and understand how over-reliance on ICTs can negatively impact real-world relationships. When monitoring ICT use among children on the autism spectrum, educators might consider how long and for what purpose these technologies are being used (Livingstone & Blum-Ross, 2020). As with parents, teachers may wish to use *active mediation* rather than *restrictive mediation*. The active mediation of ICT use is achieved through open communication and negotiation with the child, whereas restrictive mediation places concrete limits on usage. Indeed, active mediation is associated with lower online risks without significantly restricting the opportunities for children to develop greater digital skills. That said, restrictive mediation may be important for children with low self-regulatory capacity (i.e., children who show a low ability to control their behaviour; Lee, 2013).

- Third, given the elevated risk of cyberbullying for individuals on the autism spectrum, in addition to the practices listed above, educators might wish to supplement ICT use with **instructions to guide appropriate online behaviour**.

- Finally, owing to social and communication difficulties, educators might offer **to facilitate online communication and review past interactions with autistic students**. This practice may help students apply newly acquired social skills to their everyday lives and increase confidence during online interactions.

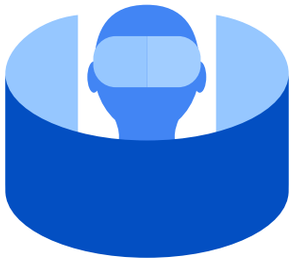
In light of these recommendations, school administrations must provide continuing education and training opportunities for educators supporting children on the autism spectrum. Indeed, studies highlight a pressing need for improved training and neurodiversity awareness among education professionals (Fleury & Kemper, 2022; Van Der Steen et al., 2020). Specifically, educators should be aware of the risks and opportunities of ICTs for autistic individuals and feel confident using these technologies when appropriate. Furthermore, educators frequently identify a lack of resources and time as the most significant barriers to implementing new interventions for children on the autism spectrum (Barry et al., 2020). Thus, administrators can support the efforts of special education teachers by providing adequate financial and human resources dedicated to implementing new interventions (e.g., supplying the necessary funds to acquire new tools like mobile tablets). Finally, researchers often seek to involve school personnel in studies evaluating interventions for school-aged children (including research with ICTs). Special-education teachers may therefore take the opportunity to get involved in research and advocate for the needs of autistic students. Specifically, feedback from special-education teachers can shape future iterations of software products to address the needs of those on the autism spectrum.

Summary of Recommendations

- → Educators may wish to use ICTs to promote the **development of social skills** among students on the autism spectrum.
- → Teachers may consider educating autistic students on the specific **opportunities and risks associated with ICT use**.
- → Educators may consider the **active mediation of ICT** use rather than restrictive mediation.
- → Educators can supplement ICTs with instructions to **guide appropriate online** behaviour and reduce cyberbullying risks for students on the autism spectrum.
- → Educators may offer to support students during online communications and **review past online interactions**.
- → **Administrators can support the efforts of special-education teachers** by providing continuing education opportunities and adequate financial and human resources.
- → Educators may wish to **participate in research regarding ICTs** and other interventions for students on the autism spectrum.

5 Emerging Issues – New Trends

New interventions tailored to the unique needs of students on the autism spectrum are a pressing concern for educators and clinicians. Although ICTs appear promising to supplement and support learning, more research must be done to understand the risks and benefits associated with ICT use among neurodiverse students. Due to the time spent in this environment, frequent peer interactions, and abundant opportunities to learn problem-solving strategies, the school setting presents a unique environment to develop social skills. Therefore, integrating new technologies into the school setting may be especially beneficial for children on the autism spectrum. For example, applied games, virtual reality, and robotics appear promising for training social skills such as imitation, attention and emotion production and recognition among autistic individuals (Grossard et al., 2018). One study evaluated the efficacy of a tablet-delivered intervention targeting language and social skills among children on the autism spectrum (Parsons et al., 2019). Results suggested that the participants demonstrated improved language and social skills following the intervention. Notably, these improvements were still present 12 months after the intervention (Parsons et al., 2019; 2020).



Applied games, virtual reality, and robotics appear promising for training social skills such as imitation, attention and emotion production and recognition among autistic individuals.

Moreover, virtual environments can provide a unique opportunity to mimic real-life situations while eliminating physical risks (Boucenna et al., 2014; Grossard et al., 2018). For example, virtual reality (VR) devices can immerse participants in life-like environments through advanced auditory and visual simulation (Dechsling et al., 2021). Other devices, such as augmented reality (AR) glasses, can supplement real-world experiences with superimposed images or sounds (Dechsling et al., 2021). Research demonstrates that VR and AR technologies can effectively teach social skills to individuals on the autism spectrum. In particular, virtual environments can help train emotion recognition (i.e., interpreting another's emotions), expression (i.e., displaying appropriate emotions for the situation), imitation (i.e., responding to another's emotions with congruent emotions) and joint attention (i.e., focusing on the same object as another person) among autistic individuals (Boucenna et al., 2014; Grossard et al., 2018). However, it is worth noting that sensory sensitivities and related anxiety concerns may make immersive VR experiences stressful for some individuals on the autism spectrum (McCleery et al., 2020). Nevertheless, many autistic participants report high levels of motivation and satisfaction with these interventions (Dechsling et al., 2021).

Forward-thinking educators and administrators may ask how these interventions could be integrated into the curriculum to support students on the autism spectrum. However, more research is necessary before drawing conclusions regarding the efficacy of ICTs among autistic students. Questions about which types of ICTs are most appealing, practical and effective for individuals on the autism spectrum remain unanswered. Future research should investigate the impact of differences in the intensity of autistic traits, gender and age on the risks and opportunities relating to ICTs (Macoun et al., 2021). For example, research should examine the effects of age on problematic ICT use among individuals on the autism spectrum (Macoun et al., 2021). Furthermore, research should measure the prevalence of cyberbullying in autistic adults, given that the current studies have excluded this age group (Macoun et al., 2021). Finally, considering that individuals on the autism spectrum are attracted to video games, future research should investigate the potential social benefits and risks associated with multiplayer games (Macoun et al., 2021).

Research demonstrates that VR and AR technologies can effectively teach social skills to individuals on the autism spectrum. In particular, virtual environments can help train emotion recognition, expression, imitation and joint attention among autistic individuals.

6 Lessons from Emergency Remote Education

The global COVID-19 pandemic created a pressing need for the remote education of all students, including those on the autism spectrum. Some students enjoyed remote learning, while others did not (Reicher, 2020). However, remote learning appears to be beneficial for autistic children and adolescents (Reicher, 2020). Specifically, remote education appears to reduce the social and sensory demands placed on young people on the autism spectrum (e.g., fewer unplanned social interactions and fewer distractions such as loud noises or odd smells) and limit the instances of bullying directed at neurodiverse students (Hill et al., 2021; Reicher, 2020). This online medium could therefore reduce the need for autistic children to camouflage (i.e., attempt to hide) their symptoms (Gillespie-Lynch et al., 2014). Furthermore, remote education may be less stressful than traditional school environments, given that individuals on the autism spectrum often experience stress associated with new settings and routine disruptions (Corbett et al., 2009). Moreover, research has demonstrated that remote education effectively meets the learning objectives of neurodiverse students (Aloizou et al., 2021). However, further research should examine the long-term social and academic consequences of remote learning in autistic children. This final point is especially important considering that, as discussed above, schools are an essential environment for developing and practising social skills (Kasari et al., 2011). Nevertheless, this emergency transition to remote education highlighted three key lessons for educators supporting children on the autism spectrum. Autistic children:

- learn best in the presence of nurturing social interactions (e.g., at home with family)
- benefit from more flexibility (e.g., the freedom to establish routines),
- prefer environments with fewer sensory demands (e.g., a room with few visual or auditory distractions; Hill et al., 2021).

Finally, the COVID-19 pandemic also highlighted the digital divide between low- middle- and high-income countries (Kumm et al., 2022). Numerous individuals on the autism spectrum live in low- to middle-income countries, limiting their access to technology (Kumm et al., 2022). Moreover, even within high-income countries, the digital divide affects disadvantaged families. In light of this, affordable, accessible and culturally appropriate ICTs offer a promising avenue for bridging the digital divide and supporting autistic individuals with a low socio-economic status (Kumm et al., 2022).

7 Further Reading

[Information & Communication Technologies Use by Children & Youth with Autism Spectrum Disorder: Promise and Perils (Macoun i in., 2021)]

This review of the scientific literature presents some important insights regarding the amount, type and reasons for ICT use among individuals on the autism spectrum. This article also discusses the benefits and risks of ICT use for autistic individuals. Finally, this review presents recommendations for future research and a framework to evaluate the benefits and risks of ICTs for individuals on the autism spectrum.

[Cyber-Aggression and Victimisation and Social Information Processing: Integrating the Medium and the Message (Runions i in., 2013)]

This article applies the social information processing theory to evaluate the potential impact of the inherent properties of ICTs on cyberbullying. This analysis highlights five features of ICTs that influence social information processing and, in turn, cyberbullying. Namely, the limited social cues, permanence of messages, lack of privacy measures, large audiences and continuous access afforded by ICTs can all influence cyberbullying. The authors also provide recommendations for future research.

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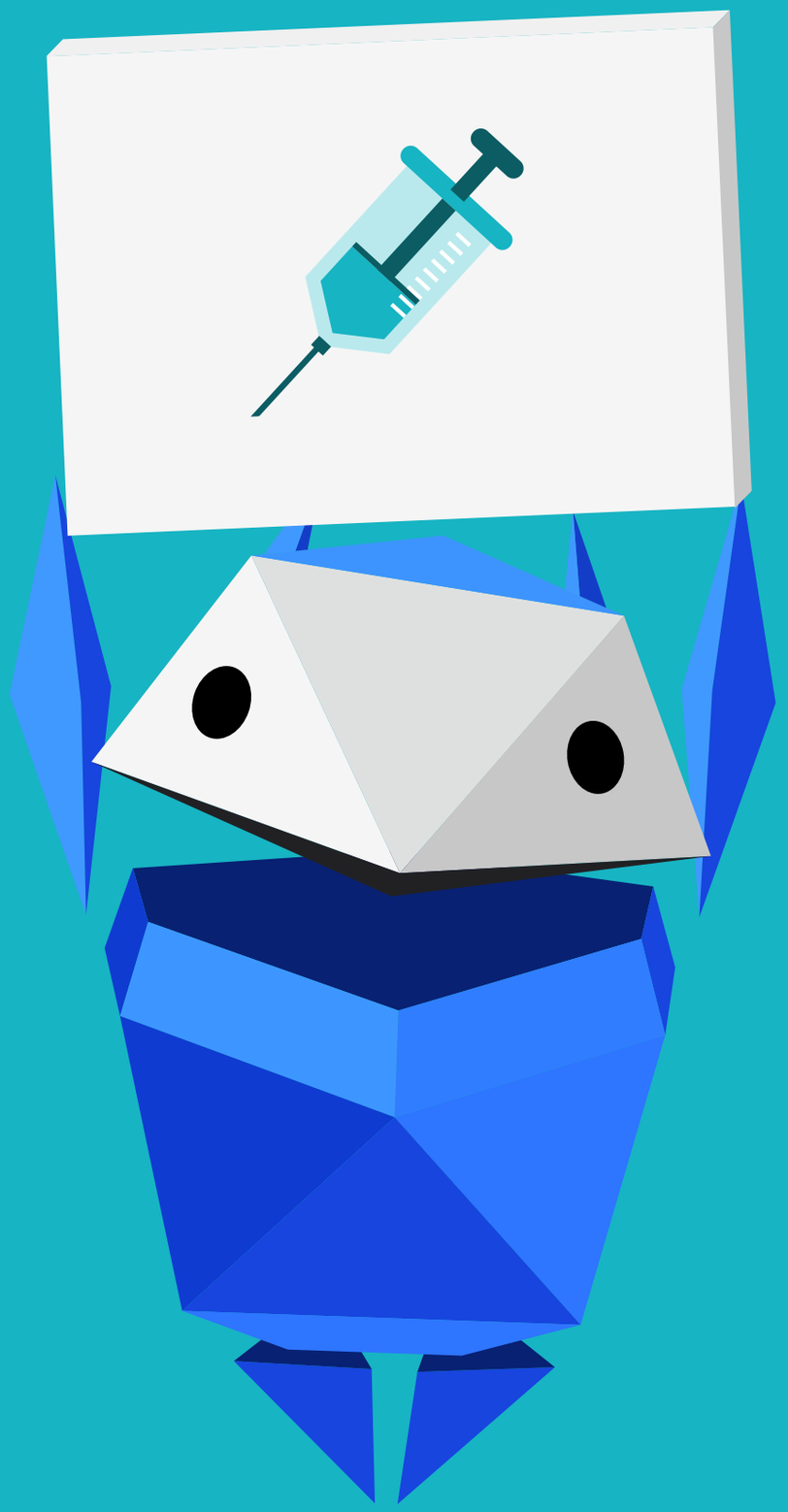

Children with Chronic Illnesses and ICT

Marianthi Papadimitriou

School with Class Foundation

Be Internet Awesome.

1 Chronic Paediatric Illness

Chronic illness during childhood (e.g. asthma, diabetes mellitus, epilepsy, heart conditions, haemato-oncological diseases, kidney diseases, cystic fibrosis, HIV) is a challenging experience with potentially a detrimental impact on the child and the family (Barlow & Ellard, 2004; Hall et al., 2019; Taylor et al., 2008).

Chronic medical conditions in children have been significantly associated with an increased risk of learning difficulties, lower academic achievement and student engagement, increased school absenteeism not explained by health reasons alone and early school termination independent of socioeconomic status (Breslau et al., 2008; Champaloux & Young, 2015; Forrest et al., 2011; Leach & Butterworth, 2012; Lum et al., 2017). Children and Young People (CYP) with chronic conditions are also more likely to report poor psychosocial and quality of life outcomes including emotional vulnerability and mental health challenges, disempowerment and loss of independence and control over their lives, social isolation and a diminished sense of school belonging (Iannucci & Nierenberg, 2022; Jamieson et al., 2014; Kirkpatrick, 2020).

Advances in medical knowledge and technology have increased life expectancy and contributed to improving the functional abilities of children with life-threatening and life-limiting conditions (Pui et al., 2018). This has shifted the professional focus from treating the illness to providing holistic care and helping the child maintain quality of life and participation in the usual childhood activities where CYP with medical needs may be at risk of exclusion (Ellis et al., 2013).

This chapter examines the use of the internet and Computer Mediated Communication (CMC) to mitigate many of the challenges that CYP with chronic, life-threatening and life limiting illnesses face and support them in continuing their education, break isolation and social exclusion and regain control over their lives and the management of their health.

Children and young people with chronic conditions are also more likely to report poor psychosocial and quality of life outcomes including emotional vulnerability and mental health challenges, disempowerment and loss of independence and control over their lives, social isolation and a diminished sense of school belonging.

The Role of Hospital Education and the Hospital Teacher

Hospital Education plays a pivotal role in facilitating the comprehensive recovery and restoration of a child's health. There are two distinct aspects to the role of Hospital Education. Firstly, there is the academic dimension, which involves offering continuity in education, assisting young individuals in their educational progress, supporting them in succeeding in their exams and achieving their academic goals. Secondly, there is the emotional aspect and the sense of hope and normalcy that is naturally associated with attending school. The focus here is on providing a supportive framework as part of a multidisciplinary team to help young people regain a sense of normalcy and agency in their lives, rebuild their self-confidence, and integrate fully into mainstream school and everyday life as they make a recovery. Both of these aspects, the academic and the social-emotional, are crucial and play a vital role in the full restoration of a child's health.

Panayiotis Kiskireas – one of the first hospital teachers in Greece. He has been working in the field of Hospital Education since 1988 at the St Sophia Hospital School in Athens where he has also served as a head-teacher.

The main purpose of the hospital teachers' work is to support the healing process. Pupils who are in hospital complete their compulsory education so that when they leave the hospital, they can return to their home school without falling behind. They develop their interests and passions and, acquire new skills, which helps them to forget, at least for a while, the difficulties of hospitalisation.

Justyna Stańczak-Szenajch – has been working in hospital schools in Poland since 2013. Currently, at the Special Primary School No. 287 at the Children's Clinical Hospital.

2 The Role of the Internet: Risks and Opportunities

The Internet can play an important role in the holistic support of CYP with medical needs by promoting continuity in education, psychosocial wellbeing and active engagement in their health management. This section discusses the risks, challenges, and opportunities in these three areas.

Specific Risks and Challenges

Concerns in this area remain related to the inequity of access to digital and telehealth services especially for children from disadvantaged backgrounds (Badawy & Radovic, 2020). Also, technological difficulties have been reported to pose challenges on the educational use of ICT. For example, considerable variance and constraints on the availability of computers, printers and internet access, and challenges related to the connectedness between the hospital and the mainstream school, with variable access to Wi-Fi and slow transmission, highlight a need for additional funding and the organisation of the technological infrastructure across the different settings (Maor et al., 2016; Weibel et al., 2020). Moreover, the medical orientation and timetable clashes between Health and Education can mean that arranging connections with mainstream schools is challenging and time-consuming (Ellis et al., 2013). Good organisation and co-ordination between the hospital and the mainstream school may increase connectedness and child-school interaction.

Regarding videoconferencing and academic attainment, the findings have been mixed. On the one hand, the use of CMC is reported to keep education alive, increase willingness and motivation to engage with schoolwork, be part of the schooling cohort and increase the confidence of the CYP about their own abilities as students (Zhu & Van Winkel, 2015). On the other hand, studies suggest that the benefits of CMC are primarily social and that technology has a negligible or even a negative impact on education due to the challenges related to connectivity, a fragmented schedule and medical routines, as well as difficulty concentrating on the on-line lesson because of other distractions (e.g. a noisy hospital environment) or physical pain (Ellis et al., 2013; Maor & Mitchem, 2015; Zhu & Van Winkel, 2015).

The medical orientation and timetable clashes between Health and Education can mean that arranging connections with mainstream schools is challenging and time-consuming.

Remote Participation in Lessons at the Child's Mainstream School

Occasionally, mainstream schools equipped with the necessary resources would allow children in the hospital to participate in lessons remotely. Unfortunately, the children themselves may soon give up on this form of learning. School classes typically can last for several hours, and often there can be chaos in the classroom. For a hospitalised child, watching online lessons can impose a significant mental strain that is sometimes incompatible with the child's health needs and the medical treatments in the hospital. While maintaining contact and a sense of belonging through videoconferencing with classmates is crucial, the daily routine of attending lengthy online lessons, further complicated by a remote connection, can be overwhelming.

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Also, parental consent and safeguarding concerns seem to add to the challenges of video connectedness with many parents objecting to videoconferencing on the grounds that the appearance would be disturbing to their children (Ellis et al., 2013).

On the part of the hospitalised CYP, being visible on a camera might be experienced as intrusive and trigger feelings of embarrassment linked to physical appearance (e.g. treatment-related changes, IV drips, nasogastric feeding tubes, hospital clothing), or the noisy hospital environment (e.g. noisy machines, other children crying, interruptions by medical staff) (Ahumada-Newhart & Olson, 2019; Hopkins et al., 2014). The videoconferencing experience might also evoke challenging feelings such as anger, frustration and sadness in the CYP for being apart from their classmates and friends and missing out on important school events. All these issues highlight the need for good preparation and the support of all those involved before, during and after the use of CMC within the hospital and educational setting.

Concerns have also been raised about safeguarding, data protection and security issues as hospitalised children and young people may often access the internet without adequate adult supervision. They may also be provided with access to their medical records without adequate guidance on how to keep the health records safe. CYP with medical needs need to be guided and supported in disclosure decisions and how and when to share sensitive medical information with others (Diffin et al., 2019).

Specific Opportunities

Continuity in Education

CYP with chronic illnesses experience many disruptions and discontinuities in their lives due to repeated hospitalisations and treatments (Poku & Pilnick, 2022). To provide normalcy, a sense of belonging and continuity in education, mainstream and hospital schools have been employing a range of technologies to support individual needs, including:

- The use of videoconferencing systems (e.g. Zoom, Skype or Microsoft teams), ambient technology applications (Wadley et al., 2014), telepresence robots like PEBBLES (Weiss et al., 2001) and AVI-1 (Weibel et al., 2020) and specialist educational applications and platforms like BETNET (www.bednet.be) (Zhu & Van Winkel, 2015) and the 'Presence App' (Hopkins et al., 2014) to promote synchronous and asynchronous communication with the class and support inclusion.
- Access to podcasts and on-line lessons to continue their learning in their own time and when feeling better.
- Access to web-based school platforms to keep-up with mainstream schoolwork (Maor et al., 2016).

Mobile and Internet technologies provide opportunities for learning and easy access to information and educational resources that would not be possible in a hospital setting (Maor & Mitchem, 2020). Videophones, in particular, seem to present an easily accessible, low-cost and flexible technology solution to help vulnerable CYP stay connected and keep up with their education (Maor & Mitchem, 2015).

Videoconferencing technology and telepresence robots have been reported to increase the sense of belonging, help maintain social contact with peers and support hospitalised CYP to participate in school activities that they would otherwise be excluded from (Powell et al., 2021; Soares et al., 2017; Weibel et al., 2020). Video-connectedness also seems to help lessen the social anxiety from prolonged absence and treatment-related changes in appearance and help the CYP feel more confident about their reintegration into their main school (Zhu & Van Winkel, 2015). Such interventions also seem to help the class develop empathy and understanding of the CYP's health experience, become accustomed to the physical appearance of the CYP and reduce the occurrence of bullying (Ellis et al., 2013). Given the concerns raised in the literature regarding the safety of internet access, disclosure and data protection, as well as the social and emotional challenges but also benefits of connectedness, it is essential to establish mechanisms to ensure the optimal utilization of technologies while minimising any negative consequences.

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Overcoming Loneliness and Isolation

Our pupils, especially those in the oncology units and isolation wards, often endure a profound sense of loneliness and seclusion. Separated from their peers, friends and family, sometimes even from their parents, they face a challenging and lonely journey to recovery. Confinement within the hospital walls can deprive these children of normal social interactions and familiar support systems, causing feelings of loneliness, sadness and disconnection. It is crucial to recognise the emotional toll that hospitalisation takes on these children and to prioritise measures that alleviate their sense of seclusion through compassionate care, creative learning activities, and meaningful connections with loved ones and peers. Towards this end, at our hospital school, we often use video-conferencing systems like Face-Time, Zoom and Skype to connect to the mainstream school and promote a supportive and inclusive environment that nurtures our pupils' well-being and helps them feel connected and included in their regular school community.

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Social-Emotional Wellbeing

Technology can offer many opportunities to support children's psychosocial wellbeing when in confined healthcare spaces and help them establish a healthier personal identity that focuses on being a regular young person rather than simply a patient confined in a bed and defined by their illness (Lambert et al., 2014; Tomberli & Ciucci, 2021; Weibel et al., 2020).

Mobile and social technology is reported to help the CYP and their parents remain connected, share the journey they have travelled with significant others and access the social support necessary to keep them afloat during this turbulent and challenging time in their lives (Maor & Mitchem, 2020). Maintaining contact with the outside world and accessing social support is considered a key predictor of positive adjustment for a CYP with chronic illness and their families (Ellis et al., 2013; Lambert et al., 2014).

Specifically, the use of videophones with friends and family is reported to increase smiling and laughing and help maintain a sense of normalcy and connectedness (Maor & Mitchem, 2015). Also, on-line peer groups operating through technologies like Facebook, Instagram, Snapchat and websites with discussion forums seem to function as a safe space where CYP and their families can collectively share their experiences and feelings and receive support on managing specific therapies and services or ways to maintain a healthy and normal life (Kirk & Milnes, 2016). On-line peer-support groups seem to also have a positive impact on quality of life, help reduce stress, anxiety and depression levels and increase retention in healthcare (Berkanish et al., 2022).

Web-based virtual communities designed to bring together paediatric patients like Zora and Starbright World in the US and Canada (Battles & Wiener, 2002; Bers et al., 2010; Nicholas & Ba, 2007) and Solas in Ireland (Lambert et al., 2014) have been successfully used to support CYP's education, entertainment, socialisation and treatment. Such networks have been reported to decrease withdrawal behaviour, help the CYP feel significantly less lonely, and increase medical adherence and willingness to return to the hospital (Maor & Mitchem, 2020). The gaming element incorporated into such and other technologies also seems to offer significant psychological therapeutic benefits as it may function as a mental escape and a playful distraction from the stressful medical treatments and hospitalisation (Maor & Mitchem, 2020).

Health Management

On-line health platforms for CYP with medical needs are becoming increasingly available (e.g. the paediatric platform 'MyGosh', at Great Ormond Street Hospital, London). These platforms may allow CYP and their families to digitally access medical records and letters, manage medical appointments and communication with the medical team and access health-related information and support remotely (Kirk & Milnes, 2016).

The use of on-line health record systems and platforms is reported to increase CYP's knowledge and understanding of their health condition or disease process (King et al., 2017; Mörelius et al., 2021), to increase adherence to therapy and improve control over the management of their condition (Byczkowski et al., 2014; Piras & Zanutto, 2014), as well as patient – health-care provider relationships and communication (Carini et al., 2021; Kruse et al., 2015). This in turn may lead to improved self-advocacy skills and more active CYP engagement in the form of asking questions and initiating conversations about their care. It may also lead to a greater likelihood of multidisciplinary shared decision-making and the long-term improvement of health outcomes for these CYP (Diffin et al., 2019).

The use of on-line health record systems and platforms is reported to increase CYP's knowledge and understanding of their health condition or disease process, to increase adherence to therapy and improve control over the management of their condition, as well as patient – health-care provider relationships and communication.

3 Recommendations

Given the above risks and opportunities, some key recommendations for educators working with children with chronic illnesses can be formulated as follows:

- **Restoring social connectedness as soon as possible:** Hospitalisation enforces abrupt separation from friends and family with a direct impact on a CYP's social relations and emotional well-being (Hall et al., 2019). Using CMC as early as possible to link to the outside world and restore connectedness with significant others, including the home-school community, should be a priority in helping to normalise life in the hospital and promote social and emotional wellness.

- **Bringing CYP together as part of on-line paediatric communities:** It is also important to help link CYP with similar conditions and experiences together and establish supportive on-line paediatric communities that would function as a safe network to help these CYP and their families stay afloat during their most challenging times (Kirk & Milnes, 2016).

- **Promoting active engagement and school inclusion:** Digital communication offers many opportunities to support continuity in education and peer connectedness (Maor & Mitchem, 2020). However, technology alone is not sufficient. Research suggests that hospitalised CYP feel more socially connected and perform better academically when they are supported and helped to actively engage in school activities rather than when they simply use technology to observe school lessons and events remotely (Tomberli & Ciucci, 2021). Particular attention should be given to support the CYP to engage actively in the school activities and to encourage peers to include their friend in group work and make them feel active and valued members of the school community.

- **Preparing adequately for video-conferencing:** Video conferencing and robotic telepresence can provide an invaluable means of connecting the CYP with their regular community of learners and help maintain a sense of belonging (Ahumada-Newhart & Olson, 2019). However, there can also be resistance or emotional difficulty (a) on the part of the mainstream school with observing visually confronting images of children in pain or with debilitating illnesses and (b) on the part of the hospitalised CYP to being visible on video, conscious of treatment-related changes in their appearance and the distracting hospital environment (e.g. noises, machines or other children crying) (Maor & Mitchem, 2015). Photo sharing has been suggested as a good starting point to inform the class about treatment-related changes in appearance and increase understanding and empathy before videoconferencing without disrupting the child's privacy in the hospital (Maor

& Mitchem, 2015; Wadley et al., 2014). Similarly, the CYP should be adequately prepared to meet their peers and well-supported to avoid disappointment and frustration about not being able to be with their friends and for missing out on important school events.

- The need for **parental consent** may pose additional challenges to video-conferencing with some parents agreeing and others disagreeing to video-connectedness (Ellis et al., 2013). Parental concerns should be taken into consideration seriously and every effort should be made to help them develop their understanding of the importance of social-connectedness initiatives, taking into account the needs, readiness and feelings of everyone involved.

- **Coordinating learning between the hospital-school and the main-school:** The increasing use of portal systems in mainstream schools means that pupils are progressively more able to access information and assessment tasks through their school's website (Maor et al., 2016). At the same time, there seems to be a lack of co-ordination between hospital schools and mainstream schools to support continuity in education and a scarcity of 'best-practice' educational resources available to these CYP whenever they are able to study (Maor & Mitchem, 2015). It would be helpful to promote better collaboration between hospital-schools and main schools to support learning and explore which strategies, technologies and resources and with which children and under what conditions it would be supportive to use Information and Communication Technologies (ICT) to promote continuity in education and independent learning.

- **Teacher training on ICT and mobile technologies:** The use of ICT and mobile technologies in the hospital can play an important role in providing continuity in education and connectivity with the home school and make Hospital Education meaningful, enjoyable and practical (Mccarthy et al., 2019). Despite its importance, there seems to be a lack of teacher training in the use of ICT in the paediatric sector with many hospital teachers reporting a need for relevant training to advance their knowledge and understanding of the educational use of multimedia technologies (Maor et al., 2016). Future endeavours could focus on developing a professional development model on the use of ICT grounded in active and reflective teaching practices and exemplary paedagogies from the Hospital Education field, as well as a reservoir of best practice resources including educational, rehabilitative and recreational applications that would make learning more enjoyable, could offer a mental escape and minimise children's suffering.

- **Using technology creatively:** Chronic childhood illness is linked to increased dependency on others and feelings of inadequacy and perhaps failure as CYP often miss out on regular childhood experiences that may lead to a feeling of personal accomplishment and achievement (Pinquart, 2013; Taylor et al., 2008). The use of technology and creative applications (e.g. animation software, movie maker, podcasts and digital storytelling) to produce something they are really proud of, something more than they are typically used to achieving, may help develop a positive self-image and restore the CYP's perceptions about their overall competences and abilities (Maor & Mitchem, 2020).

Access to Online Educational Materials and Resources for CYP

Over the years, various Massive Open Online Courses (MOOCs) such as ‘Coursera’, ‘Udemy’, ‘Khan Academy’, and ‘Skillshare’ have been developed. However, these platforms primarily offer courses in English and cater to academic or professional levels, often requiring payment. Another widely known resource is gamified algorithmically orchestrated modern language courses like ‘Duolingo’, ‘Busuu’, ‘Memrise’ and ‘Drops’, each with its own pros and cons. The popular TED talks in the forms of mini-lectures often attract teachers seeking to expand their knowledge on a subject rather than school-age pupils. A great example is the ‘Brilliant’ portal, which offers short interactive lessons on reasoning in science and maths. However, similar to other resources, it is only available in English, though not for a fee.

Overall, while there are several online platforms and resources available for learning, there is still a need for diverse, accessible and free educational material in different languages and for different proficiency levels. Hospital Schools would greatly benefit from the development of a database or a curated list of freely available online multimedia resources and educational material in the children’s native language. These resources such as podcasts, quizzes or short educational videos should be tailored to the children’s ability and age, allowing them to access and engage with the content at their own pace and time. It would be ideal if each

electronic resource, whether a podcast or a video, covers a specific topic within a particular subject area. This would provide teachers with a valuable tool to enhance their teaching methods and support their pupils’ learning in a more enjoyable, easily accessible and targeted manner.

What would also help in our day-to-day practice would be digital solutions that would facilitate the coordination of learning between the mainstream school and the hospital – a space to exchange information, assignments and tests between schools and teachers from the two schools. At present this contact is usually by phone or e-mail.

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- **Developing web-content:** CYP with medical needs should also be provided with opportunities to be more involved and actively contribute to the development of web-content, for example with personal stories and experiences of the impact of the illness on the self, advice on health management, school life and peer relations. Therefore, these CYP should be supported to become more active users of the internet through blogging, tagging and social networking.

- **Promoting on-line safety:** Concerns around confidentiality and safe internet use in the hospital setting have often been raised in the literature, which considers CYP with medical needs a vulnerable pupil population (Maor & Mitchem, 2020). Hospitalised CYP need to be supported on how to stay safe on-line by thinking, for example, carefully about what they post on the internet, being aware of fake on-line identities and how to protect their own identity and personal information, and letting adults know about on-line choices and contacts. Establishing regular discussions with the CYP about their on-line experiences and ways to stay safe is considered particularly important as CYP with medical needs may spend more time on-line, often unsupervised, when in hospital (Maor & Mitchem, 2020).

- **Dealing with cyberbullying:** CYP with chronic illnesses are three times more likely to experience bullying compared to their healthy counterparts mainly due to treatment-related changes in appearance (Pinquart, 2017). Applying psychoeducational interventions like CancerEd to raise awareness in mainstream schools about the impact of illness and medical treatments on the CYP has been reported to substantially increase peer empathy and reduce bullying (Collins et al., 2019). More research is needed to understand how social connectedness can be facilitated in the hospital setting for these CYP without exposing them to harm or danger and without undermining their opportunities to communicate with other children, enjoy a social life and express themselves fully while in hospital (Lambert et al., 2014; Maor & Mitchem, 2020).

Dealing with Cyberbullying – Some Useful Tips

Advise the CYP:

- → to speak to someone they trust,
- → to keep a record of what is happening,
- → not to retaliate but to ignore the bully, block access or ask them to stop,
- → surround themselves with people who are understanding and supportive,
- → be proud of who they are and not blame themselves or take the bullying behaviour personally for this is a wider social problem that affects many CYP.

For more information and support on how to deal with bullying, visit: anti-bullyingalliance.org.uk or kidscape.org.uk.

- **Digital health-records and safeguarding:** Research highlights the importance for professionals to use digital health systems to empower the CYP to be at the centre of the decision-making process, communicate their preferences for care and be active in the management of their health condition (Diffin et al., 2019; Moqbel et al., 2021). Such an approach requires CYP to be supported in the management and use of their health e-records and be informed about privacy, disclosure and consent issues. It also renders it necessary to screen medical information and records and present this in a way that the CYP will be able to understand and manage. Information that is sensitive and not appropriate to share, or even harmful if the CYP is not able to keep their record secure should be identified and support and guidance should be provided to the CYP on how to keep their medical records safe. The CYP should also be informed and guided around disclosure decisions concerning why, when, how and with whom to share sensitive information. Organisational support to promote use, sustain motivation and increase understanding of the purpose and potential benefits and risks of digital health-systems is also considered crucial. (Diffin et al., 2019; Moqbel et al., 2021).

Information that is sensitive and not appropriate to share, or even harmful if the CYP is not able to keep their record secure should be identified and support and guidance should be provided to the CYP on how to keep their medical records safe. The CYP should also be informed and guided around disclosure decisions concerning why, when, how and with whom to share sensitive information.

4 Emerging Issues – New Trends

Increasing Participation of CYP with Medical Needs in School Through Robotic Telepresence

Telepresence robots (TRs) controlled by an app on a mobile device (e.g. smartphone, laptop or tablet) allow the CYP with medical needs to be virtually present in their class, 'raise' their hand and participate in group work. TRs usually consist of a videoconferencing system with a one- or two-way camera on a robot base that, when mobile, allows the CYP to move remotely and attend different classes, walk in the hallways with their classmates, go to lunch and breaktime or even attend school fieldtrips (Ahumada-Newhart & Olson, 2019; Soares et al., 2017).

Besides the affordability of the software and hardware, the level of positive and inclusive experience, as with all technologies, seems to depend on the ability and willingness of the teachers and peers to include the CYP as a full member of the class community, as well as on personal preferences on how a CYP feels about being represented in class by a telepresence robot (Weibel et al., 2020).

Some CYP may prefer to personalise the robot and dress them in different clothes. Other CYP concerned about medical changes in appearance may prefer not to have a visual image of themselves or to have a static picture on the screen, or perhaps to communicate with the class via different videoconferencing platforms (e.g. BETNET) (Ahumada-Newhart & Olson, 2019). One should always take into consideration the needs of the CYP, as well as the level of readiness and preparedness of the class when introducing such technologies in school.

Three commercially available telepresence robots: AVI-1, VGo and Double.
Source: AVI-1, Noisolation.com (Weibel, 2020), Vgo, Vgocom.com, Double, Doublerobotics.com

5 Lessons from Emergency Remote Education

Only two studies were located that explored how Hospital Education (HE) has been affected by the COVID-19 pandemic: one from Italy (Benigno et al., 2020) and one from Poland (Gajda et al., 2021). Both studies described that during the pandemic, a hybrid model of HE operation was employed, with some lessons taking place on-site and other lessons on-line.

In Poland, the COVID-19 pandemic seemed to have an impact on the hospital teachers' sense of employment stability with hospitalised CYP numbers dropping significantly (Gajda et al., 2021). The hospital teachers (HTs) from Italy reported challenges in establishing contact with new students and their families and felt that maintaining on-line communication with older and long-stay students was easier. The socio-economic divide also seemed to have affected access to education, with reports that students from lower socio-economic or immigrant backgrounds were struggling to accessing on-line education. Communication with the multidisciplinary team, including medical doctors and nurses, seemed to have also been hindered, with the hospital teachers feeling left out of the healthcare team (Benigno et al., 2020). Both studies highlighted the impact that remote teaching seemed to have on the teacher-student relationship and well-being with HTs feeling that spending too much time in front of a screen was not healthy and that on-site teaching is quite important for the development of a strong and secure student-teacher relationship (Benigno et al., 2020; Gajda et al., 2021).

The studies emphasised several positive aspects of the impact of the pandemic as well. Although the teacher workload seems to have increased, with hospital teachers reporting having to develop new approaches to teaching and learning, the hospital teachers also felt that this new challenge gave them the opportunity to develop alternative ways of working and incorporate more technology and innovative methodologies into their everyday practice (e.g. the introduction of teleconferencing tools like Skype and Google Meet and on-line learning content depositories/organising tools like Padlet). At the same time, both studies highlighted the need for relevant training and institutional support in this field (Benigno et al., 2020; Gajda et al., 2021).

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Organisational aspects like more flexible and easy access to their students and spending more time supporting remedial or catch-up studies were also mentioned as a constructive change (Gajda et al., 2021). Finally, a significant positive impact highlighted in the Italian study was that distance education provided an invaluable opportunity for a number of pupils with medical needs to re-join their mainstream schools and reconnect with their teachers and classmates (Benigno et al., 2020). This finding underlines the importance of applying technology in everyday HE practice to support mainstream ownership and connectedness.

Based on the more general research on health, the COVID-19 pandemic seems to have had significant psychosocial consequences for CYP with chronic conditions (physical or mental) and their families with stress-levels, anxiety and depression being significantly higher in this group compared to healthy peers and their parents (Correale et al., 2022; Martinsone & Tzivian, 2021; van Tilburg et al., 2020; Wauters et al., 2022). This seems to be linked to various parameters including reduced access and delays to medical care, increased stress when receiving face to face care because of infection concerns and further reduced social interaction and psychosocial support for a group that was already more isolated compared to the general population (van Tilburg et al., 2020).

At the same time, the pandemic rapidly increased the use of telemedicine and other digital interventions in paediatric care (Berkanish et al., 2022). It is interesting to note that the CYP who had the opportunity to access medical care and meet with the medical staff were reported to present less emotional distress compared to CYP whose medical care was suspended (Correale et al., 2022). This finding highlights the importance of continuity in care, whether at an educational, social or health care level, and the protective role this plays in the lives of CYP with chronic conditions and their families.

Synopsis

This chapter discusses the role of the internet in supporting children and young people with medical needs in areas such as education, psychosocial well-being, and health management. It explores the specific risks and challenges related to access to digital and tele-health services, technological and psychosocial difficulties in educational use of ICT in the paediatric setting, and concerns about safeguarding and data protection. It also highlights the opportunities provided by the internet, such as continuity in education through on-line videoconferencing, access to on-line lessons and web-based school platforms, improved psychosocial well-being through social connections, on-line peer support groups and virtual paediatric communities and active engagement in their health-management through online health platforms for accessing medical records, managing appointments, and communicating with healthcare staff. Recommendations when working with CYP with medical needs include: restoring social connectedness and support through early use of communication technologies, promoting active engagement and school inclusion, adequately preparing the educational communities and the CYP when video-conferencing is involved, addressing parental concerns and obtaining consent, coordinating learning between hospital and mainstream schools, and providing teacher training on ICT and mobile technologies in the paediatric sector.

The importance of telecommunications and face-to-face interactions

During the COVID-19 pandemic, all classes shifted to remote formats using platforms like Google Classrooms and Videoconferencing platforms like Microsoft Teams. Even now some meetings and educational seminars continue to be held remotely.

The pandemic taught us valuable lessons about maintaining connectivity and communication through alternative means when face-to-face interaction is not possible. It emphasized the significance of technology in enabling us to stay connected and forced us to adapt and explore new ways of utilizing technology for educational purposes, ensuring that learning and social support could continue despite physical barriers. For children in hospitals or those unable to attend school due to health issues, leveraging technology can play a crucial role in keeping them engaged and connected with learning communities. It offers opportunities for remote learning, access to educational resources, and the ability to interact with teachers and peers even when physical presence is not feasible.

By recognising the lessons learned from the pandemic, we can continue to harness the power of technology to overcome isolation, bridge gaps in education and create inclusive learning environments that cater to the needs of all learners, regardless of their circumstances.

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Having experienced online learning, I have come to appreciate the potential of telecommunications in education but also the importance of the here-and-now contact, the co-presence in one place at one time, and the live interactions with people far more.

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6 Further Reading

Home and Hospital Education: A Guide to International Innovative Practices

The LeHo (Learning at Home and in Hospital) project is an interesting multi-foundation initiative funded by the European Commission, Lifelong Learning Programme. This guide contains a collection of ICT tools and materials that can be used with children with medical needs and presents international innovative and good practices in the use of ICT within the Hospital Education sector from a range of partner countries including: the United Kingdom, Hungary, Germany, Belgium, Italy, Egypt and Spain. The project:

- **Outlines key educational factors & good practices** in the realm of Hospital and Home Education (HHE);
- **Explores ICT-based solutions** enabling children in hospital, home therapy, or who attend school part-time, **to access education.**
- **Highlights how technology can impact the methodology and paedagogy** in HHE.

Mobile Technologies in Hospital Schools Report

This is a Young and Well Cooperative Research Centre project in collaboration with the Murdoch University in Australia. The report presents the results of an innovative professional training intervention and research exploring the use of mobile technologies in Hospital Education. Nine broad areas of need emerged from the study:

1. Personal use, confidence, and time;
2. Coaching and personal support;
3. Integration of mobile technology into teaching;
4. Communication;
5. Hospital environment;
6. Access and IT;
7. Peer Collaboration;
8. Student engagement;
9. Tricks and tips;

The guide highlights the need for in-service teacher training and assistance with ICT use in the hospital setting, tailored to the personal circumstances of the hospital teachers (Maor et al., 2016).

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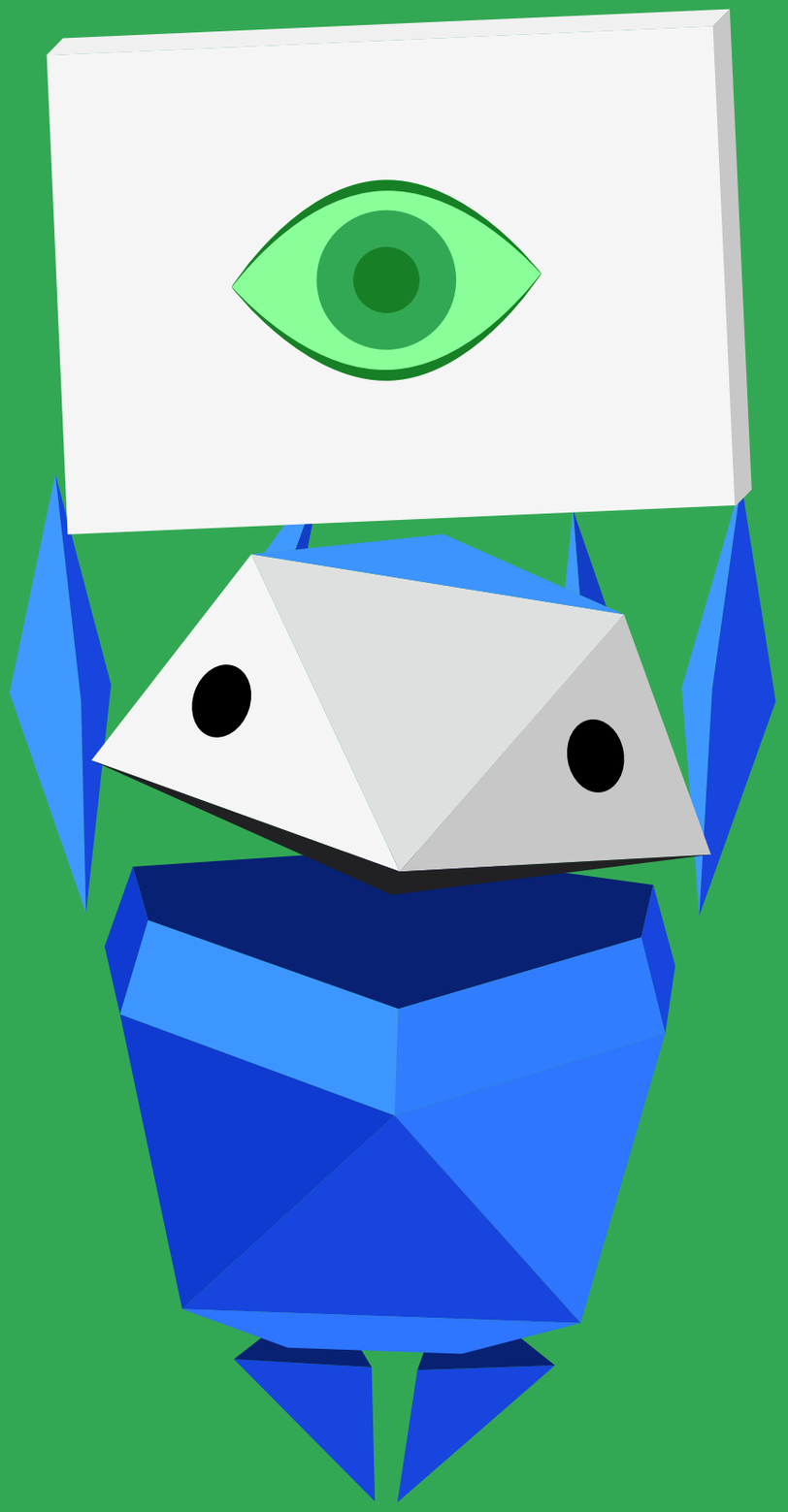


Children with Visual Impairments and ICT

Natalia Walter

School with Class Foundation

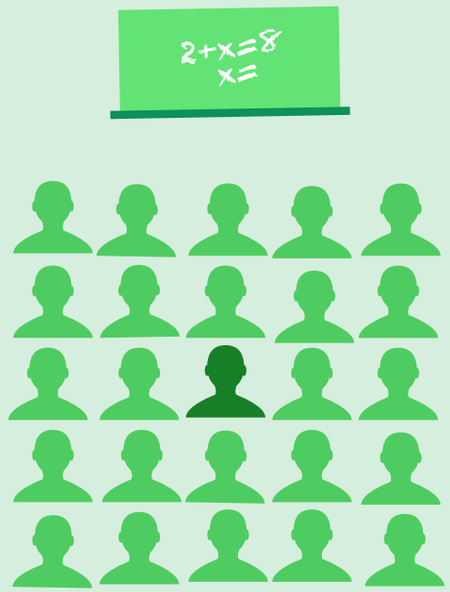
Be Internet Awesome

1 What are Visual Impairments?

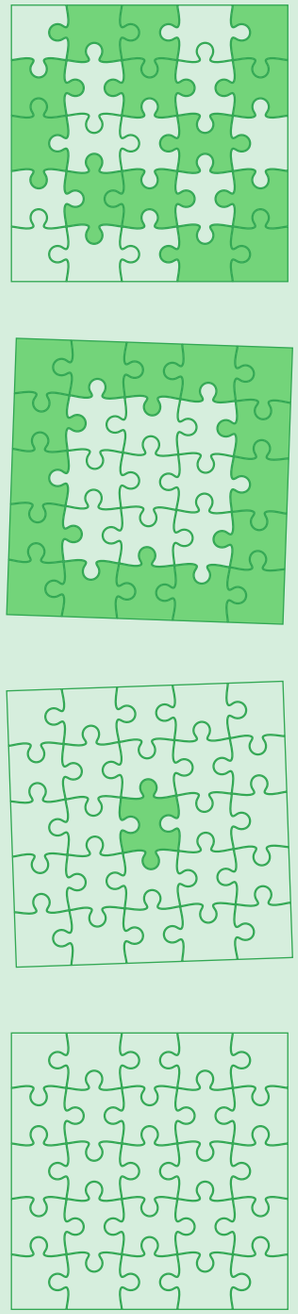
Statistics for 2020 show that about 49.1 million people world-wide were blind, 221.4 million had a moderate visual impairment, and 33.6 million people had a severe form of it (Bourne et al., 2020). Thus, it is fairly likely that there will be individual students with visual impairment in a school classroom, or that an entire class consists of students who are blind or visually impaired. Working with both individual students and entire classes of visually impaired students poses special challenges for teachers and requires their knowledge of the students themselves, their ways of functioning in everyday life and the possibilities for supporting their development.

To better understand the needs of such students, it is worth looking at the main types of visual impairment. In colloquial speech, the term 'blind', as R. A. Scott (2017) notes, means 'without sight'. In the literature, it includes both completely blind and sighted people whose vision is severely impaired. By convention, ophthalmologists consider the essence of vision to be visual acuity. This is a measure of the smallest image on the retina that can be recognized by the human eye. The most popular test of visual acuity is the test introduced by H. Snellen in 1862. It uses the Snellen chart – which is well known in ophthalmologists' offices – consisting of nine lines, each containing letters (most often with the letter 'E' at the top) of progressively smaller size (cf. Scott, 2017; Roe, Webster, 2002). Students' impairments will not always be related to visual acuity (so-called *visus*, which means that the image they are looking at is blurry or out of focus from a greater distance). There will also be students who have a limited field of vision.

Statistics for 2020 show that more than **300 mln** people world-wide had visual impairments. Thus, 1 child in a 25-person class on average.



What does a limited field of vision mean in practice?



Imagine that the world you are looking at consists of a million puzzle pieces. If you have a visual defect that limits your field of vision, it's as if someone has removed random pieces from this jigsaw puzzle. If a few of them disappear, the problem is small, but if more than 50–60% of them are missing from the image seen, perception will be very difficult.

There may also be students who cannot see the edges of this puzzle image. Or, on the contrary, they can only see them. It's a bit like looking at the world through a tunnel or a telescope – and indeed, this kind of vision is simply called tunnel vision.

There will be students who can see images placed centrally in front of them, and there will be those who can only see them out of the corner of their eye and have to turn their heads to see anything. Finally, we may have to deal with students who can't see anything at all – it's as if we were functioning in total darkness. Among them may be those who can see something in a particularly bright environment – the shadow of an object or figure. These are people with a so-called sense of light.

When starting to work with students with visual impairments, one needs to familiarize oneself with the degree of this disability and try to understand what it really means for this particular child and the options that teachers have. For that purpose, the most common terms that appear on student disability certificates come from the International Classification of Diseases, ICD 11 (WHO, 2019), which divides visual impairment into two groups: long-distance or short-distance vision impairment.

Long-distance vision impairment can occur in the range of:

1. **mild** (visual acuity from 6/12 to 6/18),
2. **moderate** (visual acuity from 6/18 to 6/60),
3. **severe** (visual acuity worse than 6/60 to 3/60),
4. **total lack of vision** (visual acuity worse than 3/60).

This visual acuity is the record from the Snellen chart mentioned above. In addition to visual acuity problems, the above-enumerated visual field problems (tunnel, constricted, other field loss) may be present.

Visual impairment can affect the quality of life for both children and adults. Young children may experience delayed motor, language, emotional, social and cognitive development. In addition, school-age children with visual impairment may (but not necessarily) experience lower educational achievement, have difficulty forming social relationships, and are more likely to suffer from depression and anxiety (WHO, 2021). A lack of vision may impede learning about new people, their locations and activities, making verbal connections with others, and initiating joint activities (Hollins, 2021; Dods, 2013).

2 Students with Visual Impairments and the Internet

Websites, social media and smartphone apps have become ubiquitous and are widely used by people of all age groups. However, it is worth noting that current digital media are primarily visual: they contain images, animations or movies (videos). This makes it more difficult for visually impaired students to fully function on the Internet, and as a result, they may be excluded from their immediate environment, such as their peers. When it comes to exchanging simple text messages, visually impaired children and adolescents have little trouble with this. They communicate through sound-enabled smartphones or computers, and the challenge is only how to listen to instant messages without unwanted people (such as family members or bystanders) hearing them. Fortunately, a sense of privacy or intimacy in listening to text conversations can be provided using simple solutions, such as headphones. It is important to provide conditions for young people to actively participate in online conversations, while giving them the privacy they developmentally need.

Visually impaired students also participate in social media. They use Facebook (e.g., update statuses, post comments and apply reactions such as likes) just as much as the general public and, on average, receive more feedback (i.e., comments and likes) on their content. Above all, they share their experiences and problems related to visual impairment (Wu, Adamic, 2014).

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It is worth emphasizing here again that social media posts by sighted people are primarily visual (especially on Instagram or TikTok). The ubiquity of smartphones with cameras has meant that it is now extremely easy and fast to take and share images on one's profile. And while official websites, such as those of newspaper publishers or public institutions, are governed by WCAG standards, allowing (at least by assumption, because standards are not always respected) blind people to access all information, this is difficult to enforce on social media. Blind users therefore apply solutions using machine learning and artificial intelligence to automatically recognize the content of illustrations, though these algorithms are quite imprecise and often contain a lot of generalizations (Morris et al., 2016). This means that algorithms can recognize what is in the picture (for example, they tell you that there's a tree and a lake), but they don't tell you about the context or the colour scheme (which for many blind people is an abstraction), and thus they only provide basic information about the photograph. Sometimes blind people also develop their own specific strategies for recognizing images, such as opening a mobile page in a computer browser, and inferring the content of photos based on text clues and community responses. When these strategies fail, blind people turn to trusted friends for help or avoid certain functions (Voykinska et al., 2016).

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3 Risks and Opportunities

Specific Risks

Among the most important challenges for blind and visually impaired young online users, incomplete accessibility should be highlighted. This can result in (Wu, Adamic, 2014; Morris et al, 2016; Weigand et al, 2013):

- **limited opportunities for full social interaction** (e.g., lack of understanding of the context of an online conversation, misinterpretation of an image message, lack of access to image-based cultural messages);
- **difficulty verifying risky content**, such as vulgar, false, violent or pornographic (content that is discernible 'at a glance' to an ordinary online user and can quickly be rejected and blocked);
- **difficulties in verifying the veracity of a given profile** (distinguishing between official and fake profiles);
- **becoming victims of cyberbullying** (an aggressor may, for example, use and offensively alter photos in which a visually impaired person is depicted), but also cyber aggressors;
- **downloading illegal software** (software piracy), accidental access to pornographic content or online gambling.

Specific Opportunities

The use of digital media provides a number of opportunities for visually impaired children and young people. Among them, the most important should be pointed out (Walter, 2007):

- **educational opportunities:** access to open educational resources (primarily e-books and audiobooks, thematic podcasts and textbooks),
- **social opportunities:** communication with peers and family, as well as with teachers and other students, active participation in the life of a peer group (establishing and maintaining relationships) and social support (access to support groups),
- **cultural opportunities:** access to museum and library resources, concerts, recordings, films with audio description and others.
- **health opportunities:** searching for medical specialists, the use of health-promoting apps and websites
- **opportunities for spatial orientation:** interactive talking maps, locators, apps that recognize places and objects.

4 Recommendations

Media (digital) education of visually impaired children and young people should be carried out from the stage of elementary education. For this purpose, it is necessary to provide students with appropriate technical equipment (available in sufficient quantity, up-to-date and trouble-free), while ensuring that the same equipment is available to all students (identically configured workstations). The computer workstation of a visually impaired person should consist of the following elements (Walter, 2008):

- **a computer with a monitor (or laptop), speakers/headphones, basic software;**
- **a network card**, providing access to the Internet;
- **a screen reader and a speech synthesizer** (reads aloud what the screen reader has recognized) or a **braille monitor** (displays what the screen reader has recognized in braille);
- **an enlarger for the visually impaired**;
- **a black and white and/or braille printer** (depending on the user's needs and predisposition);
- **scanner** (along with OCR software for recognizing printed text).

Mobile devices (smartphones, tablets) should be adapted to the perceptual capabilities of visually impaired people and include (Weigand et al., 2013):

- **audio-enabled software** (such as voice-over or TalkBack);
- **standard applications** (instant messaging, maps, etc.);
- **innovative applications**, such as a magnifier, colour ID, money reader (e.g., Cash Reader), orientation applications (e.g., Lazarillo) and object recognition (a camera together with an application like Lookout or Envision AI).

Equipment is not the only condition for effective media education. Support from well-trained teachers (both sighted and blind) who are familiar with all the electronic solutions used is essential here. In addition, teachers need to be aware of the ways in which children and adolescents they work with use technology – in terms of mobile devices and apps, as well as activities in social media.

It is essential to develop **digital competencies** in blind and visually impaired students, giving them full access to network resources and social interaction. Thus, in practice, one should:

- **teach classes about open educational resources**, while checking how accessible they are to the students in question and talking to them about it;
- **show how to create media messages** (e.g., podcasts, texts, etc.) and the purpose of creating them;
- **analyze with students new mobile applications** that can be used in their daily functioning;
- **remember to prepare materials printed in a larger font with high contrast or use an overhead projector or interactive whiteboard to enlarge the content** for the visually impaired students.

One should also not forget that studies show that visually impaired young people are prone to the risky use of the Internet and often engage in electronic aggression. Thus, it is key to work with students on their offline social relationships: arrange meetings, team-building activities, trips and sports activities. In addition, teachers should try to develop their students' ability to initiate and maintain social contacts, including through instant messaging and social media. For this purpose, educators can organize workshops, online meetings, initiate forums or social profiles, inviting their students to participate.

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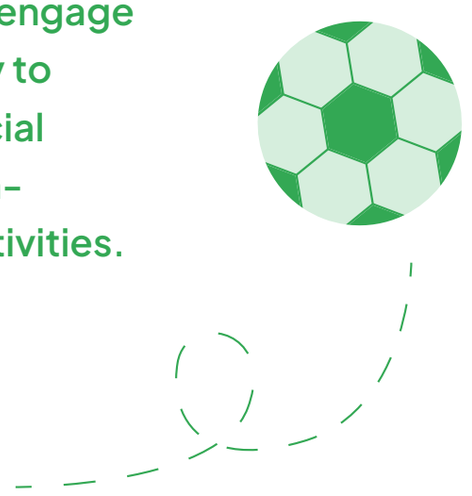

At the same time, teachers should take care of the **technical competence** of their students, including: proficiency in using the computer keyboard (the ability to write in black and white, not just Braille, and to use keyboard shortcuts that replace the computer mouse); the ability to use the devices and software that make up the so-called assistive technology (AT), such as a screen reader, OCR software, speech synthesizer, braille ruler, screen enlarger (for the visually impaired) and other peripheral devices such as speakers, scanners and printers; the ability to use mobile devices, including the ability to select and modify assistive applications.

Having said that, the educators should bear in mind that the most important issue for visually impaired students is to be able to fully participate in online activities. For this to be possible, it is necessary to draw the attention of sighted students to the presence of blind people in the Internet space and to ensure that the rules of content sharing are followed. It is necessary that young people remember what their blind peers may have difficulty with. This does not mean having to stop publishing photos or videos, but attaching short text descriptions or comments to them, for example. Increasing the awareness of sighted young people on this subject should be one of the priorities of media and digital education.

To this end, educators should also work with **sighted students**, introducing elements of empathizing during media education classes – it is crucial for students to understand that **blind people** may be among the current or future recipients of their online communications (their social media posts, videos or memes). Thus, teachers are looking together for an answer to the question of how to design content in a way that is universal, i.e. accessible and understandable to everyone. Universal design should become a permanent part of media education, especially when students are encouraged to create their own digital content. This applies not only to people with visual impairments, but also to other audiences, such as those with individual educational needs. For more on universal design, see the last link in the Further Reading section.

Technical Competence

- → proficiency in using the computer **keyboard** (writing in black and white, and using keyboard shortcuts that replace the computer mouse)
- → use of **assistive technology** such as: a screen reader, OCR software, speech synthesizer, braille ruler, screen enlarger (for the visually impaired)
- → use of **peripheral devices** such as: speakers, scanners and printers
- → use of **mobile devices**, including the ability to select and modify assistive applications

5 Lessons from Emergency Remote Education

With the lockdown resulting from the COVID-19 pandemic, schools began remote education in March 2020 – a situation that was entirely new for both teachers and students in most countries around the world. Children with disabilities, including those who are blind and visually impaired, have been the most affected by such a dramatic change, in terms of both their daily routine and the way they learn.

The digital platforms commonly used in schools were not designed to include visually impaired children. A significant number of visually impaired children have faced enormous obstacles, especially in obtaining assistive devices, due to the high cost and scarcity of specialized equipment, the inaccessibility of learning spaces, language barriers, lack of awareness, and the inadequate training of teachers (Kapote, Srikanth, 2021).

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Gothwal et al. (2022) identified six main areas of difficulty faced by visually impaired students, their parents and teachers. These are:

- **technology accessibility issues** (e-learning technologies are often not accessible to visually impaired students, or are unknown to many teachers and parents);
- **parental beliefs/concerns** (the harmful effects of technology, teachers' prioritization of sighted children, online activities considered distracting);
- **lack of ongoing direct support** (peers, parents, teachers and tutoring);
- **limited socialization and physical activity** (students had no direct contact with their peers, did not meet in person, and could not be active outside);
- **problems resulting from low socioeconomic status** (lack of resources to provide learning space and assistive technology); and
- **problems resulting from the need to constantly stare at screen media at close range** (lack of other visual stimuli and lack of rehabilitation).

The pandemic has shown that it is necessary to make greater use of information and communication technologies in the education of visually impaired children and adolescents, including the use of applications for mediated communication, both with teachers and peers. It is also necessary to organize technological support points on the premises of schools or boarding schools so that students are well-prepared for independent learning in a crisis situation of remote education.

The pandemic has shown that it is necessary to make greater use of information and communication technologies in the education of visually impaired children and adolescents.

6 Further Reading

The following four readings can be helpful for educators willing to deepen their knowledge and find inspiration for activities involving students with visual impairments:

- How do teenagers with visual impairments use digital technologies to negotiate the world? – Lancaster University blog post by Sue Cranmer
- How Technology for Visually Impaired is Helping People Get An Education
- Ideas for remote lessons with blind students
- Further reading on universal design

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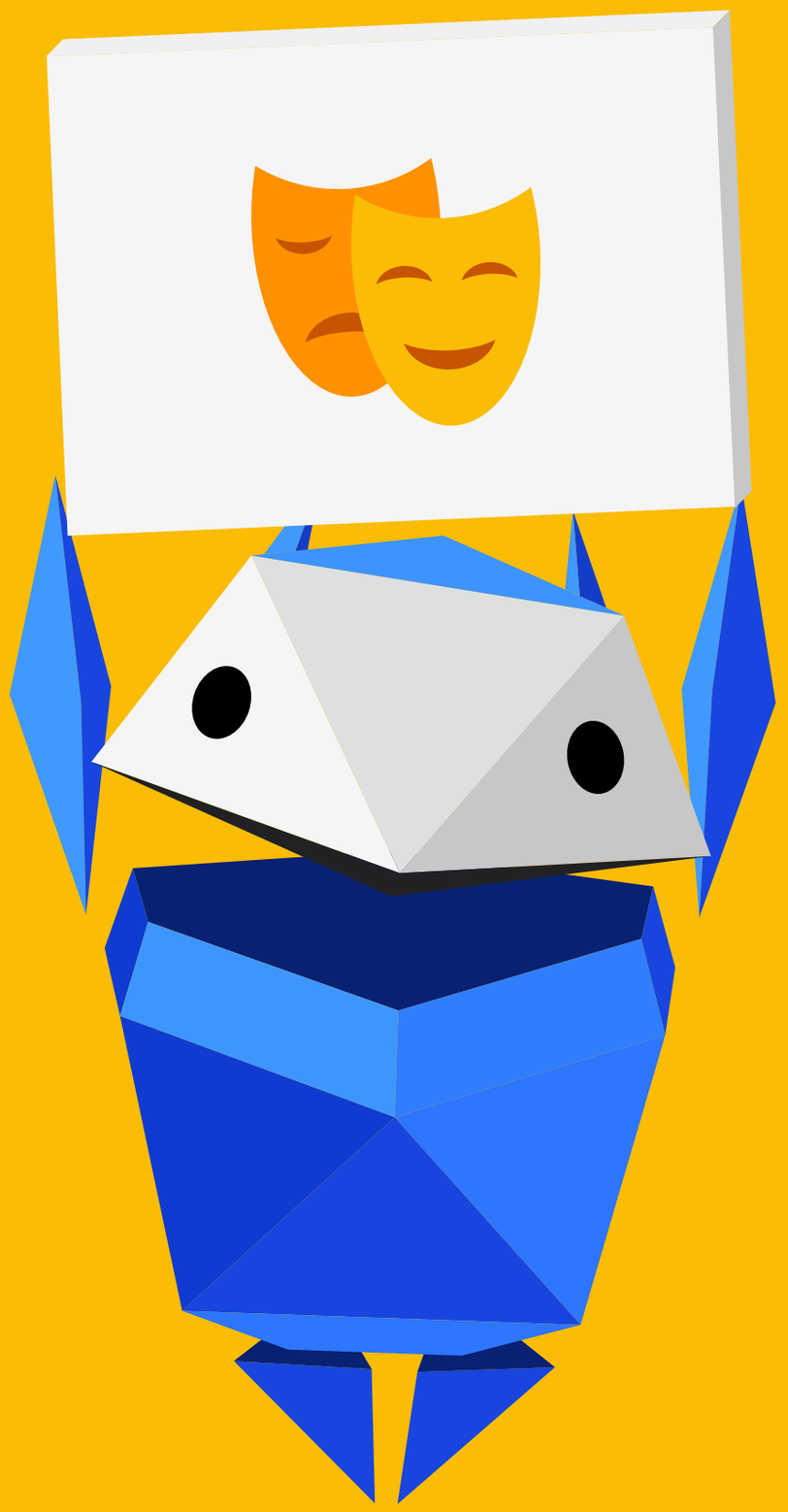


Children with Emotional and Behavioral Difficulties and ICT

Jacek Pyżalski

School with Class Foundation

Be Internet Awesome.

1 What Are Emotional and Behavioural Difficulties?

To start, it is vital to acknowledge that emotional and behavioural difficulties (EBD, also referred to as disorders or disabilities) cover a wide range of behavioural patterns and psychosocial problems of a child, such as aggression, anxiety, hyperactivity and more. Therefore, EBD are often hard to distinguish from other disabilities, partly because disabilities are often correlated and refer to the same child, impacting his or her functioning. Additionally, there are still discussions on the criteria and diagnoses, as well as arguments to include EBD among other disabilities, particularly within the school system. The latter also varies substantially among legal systems in different countries (Brigham, et al. 2021; Kaufman, 2015; Kauffman, Landrum, 2009; 2013).

EBD cover a wide range of behaviours that are challenging for the school environment and educational professionals, but also cause distress and disadvantage for the child who experiences them. Depending on the undertaken perspective, scholars may focus on the behaviours of children with EBD, the emotional and psychological problems they experience, or all those aspects, also using the holistic approach focussed on the social environment of a child. Generally, in the educational context, pupils with EBD demonstrate behaviours that are problematic in a school environment (e.g. being off-task) or openly disruptive (an actively negative interference with the learning activities). This frequently results in lower academic achievements or drop-outs (Didion, Toste, Wehby, 2020; Mulcahy, Krezmien, Maccini, 2014) that multiply the existing problems through the mechanisms of a vicious circle (one problem reinforcing another). Also, longitudinal studies indicate that EBD may heighten the risk of social maladjustment (including delinquency and substance abuse), which may persist into adulthood (Indris, Barlow, Doland, 2019). Hence, early intervention to prevent this at school age is crucial.

Pupils with EBD demonstrate behaviours that are problematic in a school environment (e.g. being off-task) or openly disruptive (an actively negative interference with the learning activities).

For this chapter, it is beneficial to quote a classic and widely used typology provided by T. Achenbach (1978) that defines two main groups of disorders, namely externalizing and internalizing disorders, both of which fall under the umbrella of EBD (Table 1.).

Depending on the diagnostic criteria, the estimate of EBD prevalence is between 3% to 9% in the general population (for both internalizing and externalizing disorders) (Mooij, Smeets, 2009).

It is vital for those working with children with EBD to recognise that emotional and behavioural difficulties are sometimes wrongly interpreted as a phenomenon that is only connected with individual characteristics, while a more systemic approach also covering social and family factors is needed. Those factors, particularly when negative, e.g. family or peer violence or aspects of the curriculum (and teacher-student relationship), may influence the occurrence of EBD (Didion, Toste, Wehby, 2020; Mooij, Smeets, 2009).

Pupils with EBD attend both special and mainstream education schools. Many studies have shown that teachers, particularly from mainstream education, assess their ability to support the needs of children with EBD as lower in comparison to their ability to support the needs of children in other special education subgroups. Moreover, a lack of adequate support for students with EBD, particularly in the early stages when challenging behaviours first occur, may amplify these difficulties (Mooij, Smeets, 2009).

Table 1 Typology of disorders according to T. Achenbach (1978)

Externalizing disorders	Internalizing disorders
→ Aggression	→ Withdrawal
→ Antisocial behaviour	→ Anxiety
→ Defiance	→ Depression
→ Impulsivity	→ Low self-esteem
→ Hyperactivity	→ Obsessive and compulsive behaviour

3–9%
of the general population face emotional and behavioural difficulties

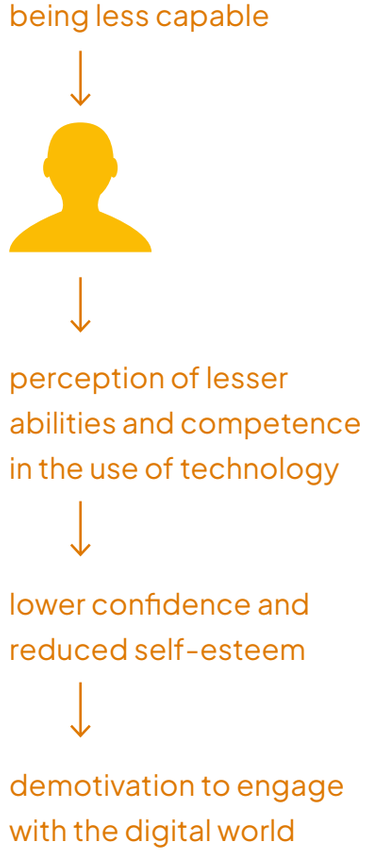
2 Students with Emotional and Behavioural Difficulties and the Internet

The literature exploring the specifics of the digital risks and opportunities for children with EBD is rather scarce and often focused on specific subpopulations in the particular national and social context. Still, some valuable data can be used as a basis to formulate evidence-based generalizations covering students with EBD and their life in the digital environment (Williams, et al., 2006).

The EBD group seems to be a subgroup that is profoundly affected by digital inequality, which is usually understood in this case not as a lack of hardware, software or Internet access but rather as lower digital skills and a lack of ability to take full advantage of the digital environment (Van Dijk, 2020; Zhang, Livingstone, 2019).

The crucial problem linked to digital inequalities in the case of children with EBD seems to be related to their environment, which is not supporting the development of digital skills. As a result, this makes young people from this group more prone to digital risks.

Recent studies suggest that in the case of many children from disadvantaged groups, not only those with emotional and behavioural disorders, digital skills may be negatively affected by the fact that these children are (and perceive themselves as) discriminated against. What is important here is that this discrimination may be experienced both online and offline. In this context also a kind of vicious circle may appear. It may mean that a young person is discriminated against and labelled as incapable. Afterwards, by inhabiting this label they believe they are less capable and competent in using technology. This in turn may reduce confidence and lower self-esteem. A result such belief may lead to demotivation to engage with the digital world. Young people who feel discriminated against seem to develop digital skills slower and achieve lower levels of digital abilities, probably because other risk factors for the impairment of digital skills (e.g. those connected to a family environment) have a stronger effect in their case (Mascheroni, et al., 2022). Still, this preliminary finding needs to be confirmed in the future since relations between EBD, discrimination and health risk behaviours seem more complicated and are not easy to interpret (Martin-Storey, Benner, 2019).



3 Risks and Opportunities

Generally, describing specific risks and opportunities is a difficult task in the case of children with EBD. This is mostly because there is a wide range of individuals with radically different problems (e.g. externalized or internalized disorders that are additionally represented with different levels of severity) under the umbrella of 'EBD'. This means that digital risks and problems are not qualitatively specific but universal, yet digital/Internet risks and opportunities may arise more frequently in this group. In numerous instances, especially when there is no empirical data, this implies that we have to draw conclusions from conceptualizations, which results in a higher risk of speculation. However, since this information is necessary to support effective media education in children with EBD, this uncertainty cannot be fully avoided.

Specific Risks

Children and adolescents with EBD experience a higher risk of mental health and sexual health problems. Many adolescents now, including young people with EBD, present help-seeking behaviours, especially looking for information and support online. Topics of particular interest include those concerning interpersonal relations, stress, eating disorders, weight, depression and anxiety concerning the future (Suzuki, Calzo, 2004). This trend seems to be increasing since the amount of online information and potential Internet sources are more and more available, particularly on mobile devices when access is mostly not supervised by parents, especially in older children.

Research shows that adolescents are reluctant to share important health concerns directly with professionals (e.g. school councillors) or adults in general (Ackard, Neumark-Sztainer, 2001). They instead turn to their peers and prefer online settings, where a certain level of privacy and confidentiality can be ensured. Two main sources are used by young people in terms of seeking this type of information: peer forums / social networking sites and materials prepared by health professionals. In both cases, there are possible risks that the information obtained (and implemented) will not be accurate. In the first case, young people with EBD may access online forums or threads where people with similar problems gather and often exchange information that may not be credible and helpful.

Research shows that adolescents are reluctant to share important health concerns directly with professionals or adults in general. They instead turn to their peers and prefer online settings.

Additionally, even credible materials may be and often are prepared using language that is too difficult to understand for young users (Grohol, Slimowicz, Granda, 2014).

Two further important risk phenomena that should be described in the context of EBD children are cyberbullying and problematic internet use. Although these two risks are not exclusively linked to EBD children, young people with EBD may be more often engaged in them.

Cyberbullying is repeated hostile behaviour including abuse of power with the use of Internet tools. As such, it is a digital version of so-called traditional bullying, which is defined similarly but based on face-to-face violence (such as physical or verbal actions against someone or exclusion – so-called relational bullying) (Olweus, Limber, 2018). Cyberbullying may be perpetrated in numerous forms such as flaming, harassment, denigration, impersonation (theft of online identity), outing and trickery (revealing secrets online), exclusion or cyberstalking (Willard, 2007). Children with EBD are more likely (similarly to other special needs students) to engage in peer cyber/bullying in all roles: perpetrators, victims and bully-victims. However, it should be underlined that emotional and behavioural difficulties may both be a risk factor for cyberbullying and its consequences (Schultze-Krumbholz, et al., 2012).

The crucial mechanism that may be involved in EBD children is their relatively lower social skills (also present in the digital environment) and the character of their emotional reactions, which may lead to greater victimization and perpetration or both. It is also more difficult for those children to receive help and defend themselves or resolve peer conflicts (Pereira, Lavoie, 2018). Since bullying and cyberbullying often overlap in individuals and are to some extent stable over time (Camacho et al., 2022), this may significantly increase the risk of EBD in children, who often experience other problems in parallel – for example, related to their family situation (Poulou, 2015).

Forms of cyberbullying

- flaming
- harassment
- denigration
- impersonation (theft of online identity)
- outing and trickery (revealing secrets online)
- exclusion
- cyberstalking

Problematic (excessive) internet use (sometimes referred to as Internet addiction) is commonly defined as the inability to control one's own usage of the Internet, which causes a syndrome of psychological and social problems (Spada, 2014). Usage of the Internet in a problematic way is often associated with mental health and social problems (including those that are conceptually part of EBD). The issue here is whether those problems are an effect of problematic internet use or a factor that pushes young people to use the internet that way, or both. The causal relationships are hard to establish here (Boniel-Nissim, Sasson, 2018; Restrepo, et al., 2020). In EBD children, problematic internet use may be both a way to cope with experienced emotions and to address problems with establishing peer contacts, which are easier to establish online.

Specific Opportunities

In this section, a few main areas where ICT may be beneficial for young people with EBD have been enumerated.

The first is connected to learning motivation, which is often impaired in this group for various reasons. As such, ICT-based learning may facilitate engagement in learning through self-competition, improved competence and self-esteem (Williams, Jamali, Nicholas, 2005). The more advanced example of such measures may be so-called applied games that are defined as educational applications, which combine serious content through teaching, learning, communication and providing information with the engaging and entertaining aspects of video games. In the case of EBD children, such games may be used as attractive measures to develop social and emotional competencies (e.g. seeking help or establishing peer relations). These games may also directly address the risk problems defined above, namely cyberbullying and problematic internet use (e.g., Calvo-Morata, et al., 2020).

Additionally, the Internet may help EBD children establish positive peer contact in social media or other online groups focused on specific interests (e.g. music, sport, art). However, the risk here is that such online interaction will act as a replacement for traditional relations and will bring more problems in the long term.

Presented before as a risk, the strong need of EBD children to seek help, supportive contact and information online is also, under favourable circumstances, a great advantage. Since the Internet provides opportunities for anonymous browsing for information and sometimes for the use of professional and semi-professional help, it can be a valuable tool for achieving support that would (in some cases) not be achieved otherwise. This is partially backed up by research (Prescott, Hanley, Ujhelyi, 2017), which also shows the need to prepare young people for being critical and cautious when receiving emotional or informational support.

EBD children may also receive a better education when their parents are supported through online groups. Such groups (similar to traditional face-to-face groups) can be a great source of valuable information and emotional support, including in crisis situations (DeHoff, et al., 2016). At the same time, we should remember that unreliable or even potentially harmful advice can be shared in such groups (Mertan, et al., 2021). Similar measures also seem beneficial for professionals working with children with individual educational needs in general (Billingsley, Israel, Smith, 2011).

Summary of Key Opportunities

- → engagement in learning through self-competition
- → serious games as attractive measures to develop social and emotional competencies
- → positive peer contacts in social media or other online groups focused on specific interests
- → anonymous browsing for information and use of professional and semi-professional help
- → a source of valuable information and emotional support for parents

4 Recommendations

Many scholars formulate general aims for supporting young people with EBD (Didion, Toste, Wehby, 2020; Mooij, Smeets, 2009). They could be briefly summarized in the following points:

- **Adjusting classroom activities in a way that matches EBD children's competencies** (this should be done based on preliminary evaluation of those competences),
- **Building engagement** (e.g, by organizing creative digital activities linked to the topic of interest),
- **Building responsibility and self-regulation in EBD children** (e.g. by establishing together online safety rules),
- **Building a supportive student-teacher and peer environment** (online contact with a teacher during, for instance, homework activities or using platforms, which allow for online peer cooperation are good examples here),
- **Constant contact with parents/carers of EBD children** (e.g. through the digital diary, to ensure exchange of information and actual co-operation of a school and home environment).

All of these aims can be fulfilled thanks to ICT measures used properly from an educational perspective. Thus, using ICT in this way (and particularly the Internet) may be a leading recommendation. Based on the literature, the following recommendations can be formulated for media education concerning EBD children:

- **Two main risk behaviours that should be included in the curricula for this group are cyberbullying and problematic Internet use.** Both of these risks seem to occur more frequently in this group and may bring more psychosocial consequences at the same time. When providing any preventive measures, it is advisable to not only focus on those two phenomena but also on their counterparts, namely prosocial and positive contacts online (as opposed to cyberbullying) and the positive usage of the Internet (as opposed to problematic Internet use). It is also important that those problems be addressed holistically. For example, it is vital to cope with cyberbullying in the context of the entire peer situation of a young person (e.g. taking into account involvement in traditional bullying). Focusing only on online peer relations would oversimplify the problem and reduce the chances to provide effective support.

- EBD children may seek help online concerning the psychosocial problems they encounter. **The main focus should be placed on their ability to find reliable sources and to recognize those sources and pieces of information that may be harmful when implemented.** On the Internet, there are plenty of sites offering health information or support groups where one can find information that is inaccurate. From an educational perspective, education professionals may disseminate addresses where reliable content can be found among members of the school community and also provide such addresses directly to individuals in need. Additionally, some educational activities concerning information skills may be beneficial. However, the main issue here is to provide content that is well-embedded in the real life and problems of EBD children to encourage their motivation to take part. Furthermore, well-designed media education activities should be focused on debriefing fake news and disinformation. In the educational materials for this specific group, it would be advisable to focus on sample content that may be particularly hurtful when it is not reliable (e.g. content on mental health issues that may include information that is dangerous when implemented). It is also advisable to build the habit of checking online advice against other sources (e.g. a school counsellor). Moreover, such activities should be accompanied by health literacy education that helps young people understand their problems and assess the quality of the health advice and social support they receive in online and offline settings.

- As the education of EBD children is a challenging task, **it is advisable to organize good quality practical information on supporting EBD children and share it online.** But it is even more important to organize online support groups for parents and teachers (and both groups together), where there is room for exchanging practices and support. Such groups may be organized on national, regional and school level.

Building Engagement by Organizing Creative Digital Activities

To use visualization tools with them is a must, because you can achieve an agreement with kids for example when a child doesn't want to write, you can agree that firstly he or she can do some exercises using different digital tools or in the app and after that he or she will write few words or sentences on the paper. Or other example: a child doesn't want to read, but he or she has a great motivation to play with words in various interactive apps, such as Scratch, CoSpaces and Interland for sure.

Ilona Jucienė – Vilnius 'Gerosios Vilties' Pre-gymnasium

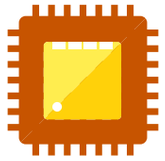
The Importance of School-Home Cooperation in Building Digital Citizenship Skills

Teaching children with such needs how to be safe on the internet involves a lot of conversations in school, at home, and constant repetition of information in various ways and situations.

Živilė Aleksienė – Vilnius 'Atgajos' Special School

5 Emerging Issues – New Trends

The big and widely discussed trend is Artificial Intelligence (AI) used in educational activities. It seems that the potential advantages are numerous in special education in general (Hopcan, et al., 2022). Among them, one can list personalized education and feedback, the easy preparation of personalized educational materials and active student engagement. These pros, although beneficial in all educational contexts, may be especially beneficial in the case of EBD children, who need individualization to a great extent. Still, it is important that an educational rather than a technological approach should be used wisely here. In practice, it is less important what the technology can do than how its usage is tailored to the needs of children with EBD.



In practice, it is less important what the technology can do than how its usage is tailored to the needs of children with EBD.

6 Lessons from Emergency Remote Education

There is no systematic wide-scale evidence of how COVID-19-related remote education targeted specifically EBD children. Still, there are some micro-conclusions from this time that may be useful for using ICT in supporting EBD children. For example, Polish studies (Pyżalski, Walter, 2022) have shown that for some children with internalizing problems, online communication (when they do not have to switch the camera on) may be very encouraging and can motivate them to be active in verbal conversations. This suggests that teachers might use online communication as an alternative or parallel way to initiate or maintain good contact with EBD students, e.g. while providing individual support when a student is preparing homework or providing advice on peer relations.

For some children with internalizing problems, online communication (when they do not have to switch the camera on) may be very encouraging and can motivate them to be active in verbal conversations.

7 Further Reading

It is important to refer to some quality resources on cyberbullying intervention. One address worth visiting is cyberbullying.org, which offers a wide variety of useful materials. One can find there the latest research data, educational materials for young people and practical guides on how to tackle cyberbullying in schools. Most of the tips are universal and may be implemented to support EBD children.

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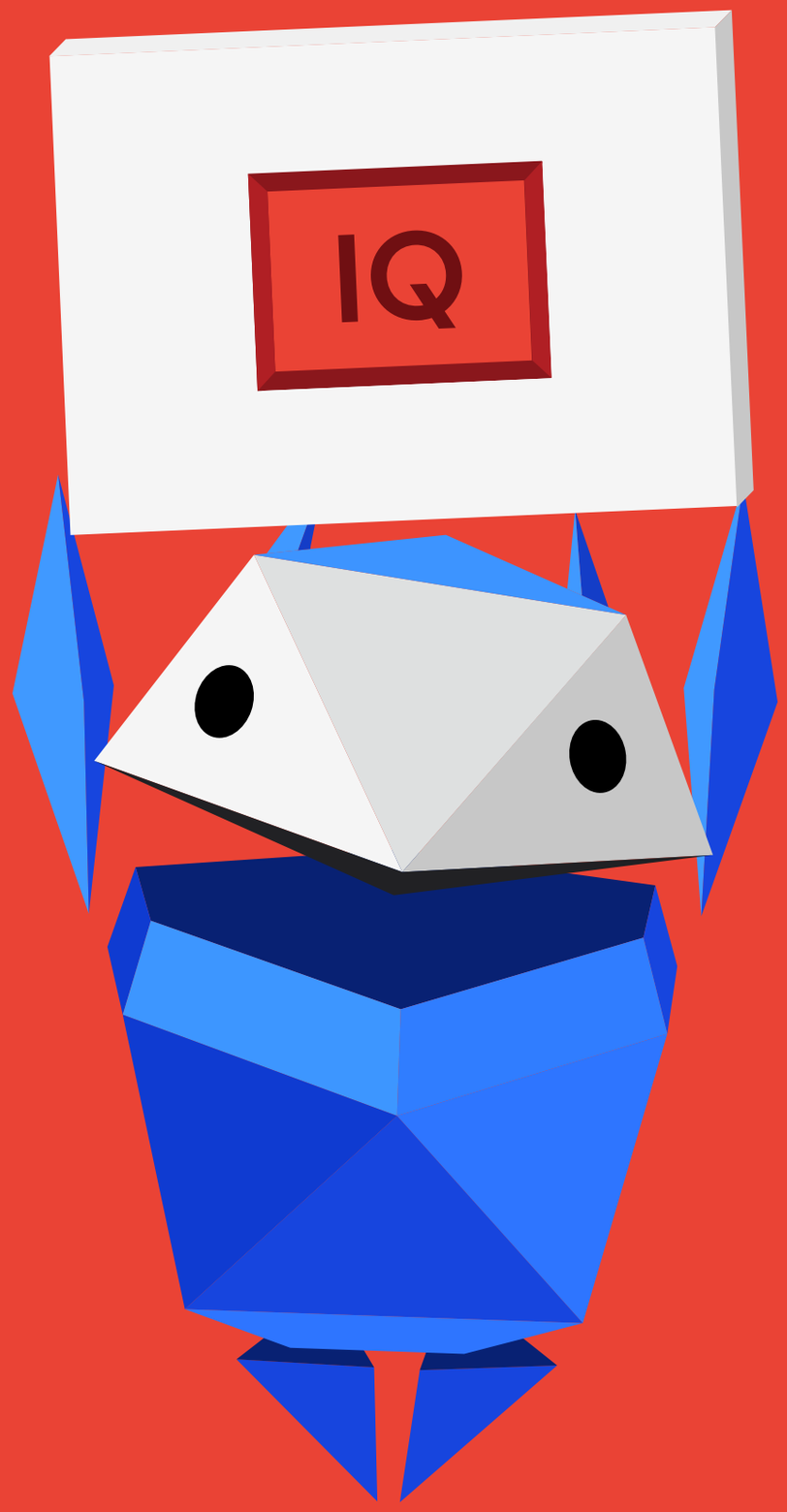


Children with Intellectual Disabilities and ICT

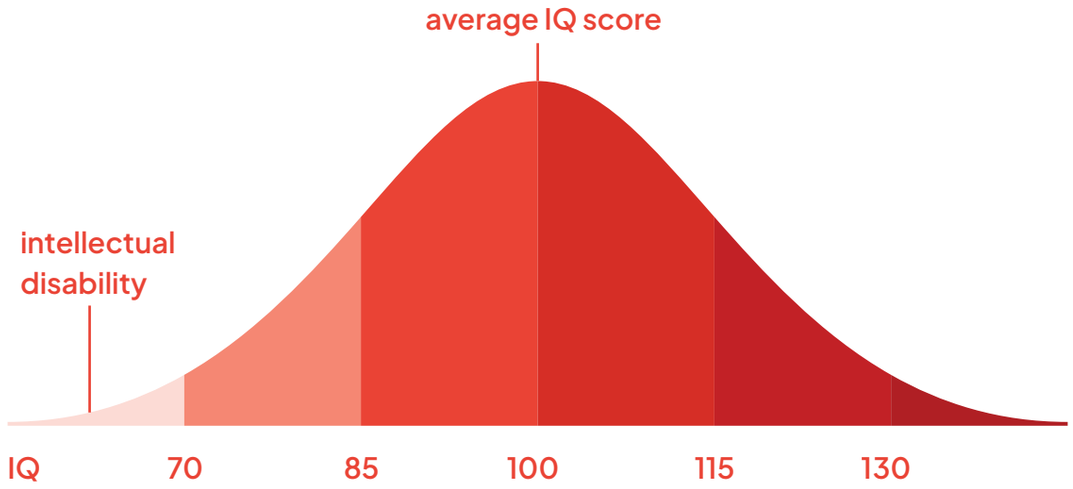
Piotr Plichta

School with Class Foundation

Be Internet Awesome

1 What is Intellectual Disability?

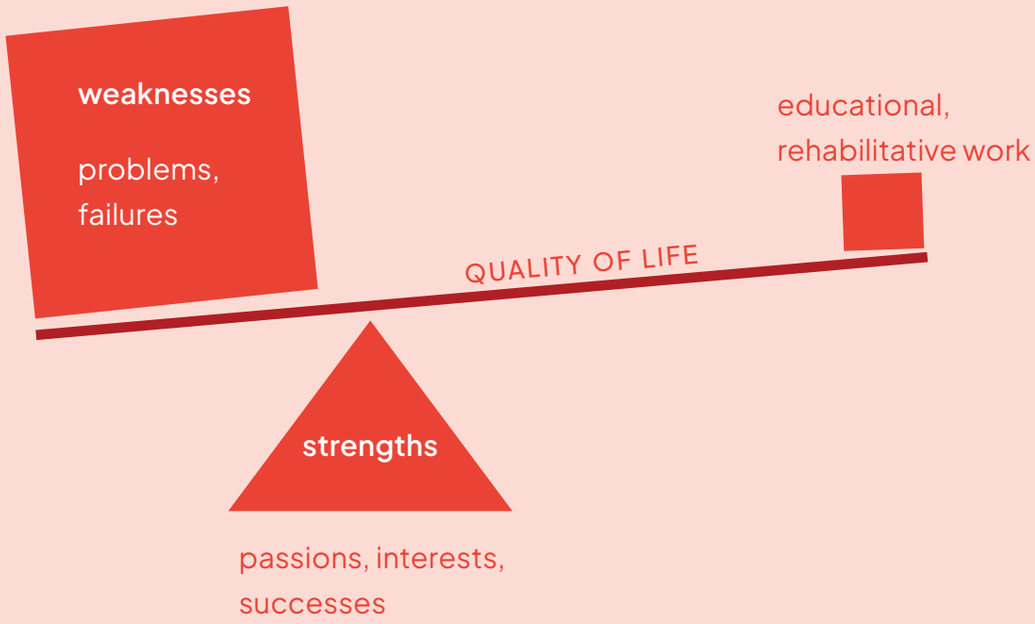
Intellectual disability, or general learning disability, involves deficits in cognitive and adaptive functioning such as understanding concepts, social functioning (e.g., communicating with others) and practical skills (e.g., domestic and academic). These problems occur during the developmental period (most often, it is assumed to be before 18 years of age) (Gałecki, Święcicki, 2015). Intellectual disability is defined by an IQ below 70 (assessed using standardized assessment tools – i.e., IQ tests). In everyday work, knowing the IQ score is less important than the so-called functional diagnosis, thanks to which we can assess what the child can and cannot do without support (their strengths and weaknesses), as well as what they cannot do but is within their reach (for example, they can perform a given task, but with help). Depending on the degree of functioning, four levels of intellectual disability are distinguished: mild, moderate, severe and profound. Young people with intellectual disability constitute a very diverse community, depending on their need for daily assistance and the kind of support they receive (for example, whether they have friends). Some will lead independent lives in the future, others will need lifelong care. It is estimated that about 2–3% of school-age children are diagnosed with intellectual disability, and the vast majority of them have mild intellectual disability. Although there has been a serious breakthrough in thinking about this kind of impairment, the descriptions of the functioning of people with intellectual disability still largely focus on deficits, the so-called Achilles' heels. Nowadays, this approach is complemented by noting, among other things, that deficits do coexist with strengths and that with tailored support, the functioning of people with intellectual disability can often improve (Schalock et al., 2010).



This is due, among other things, to the spread of the so-called social model of disability. According to it, the functioning of people with disabilities depends more on social factors such as support, adjustment than on individual characteristics and limitations (Wehmeyer, 2021). In general, there is now a major shift in the understanding of intellectual disability. It involves an increasingly integrated, holistic approach to people with intellectual disabilities, a focus on human rights, social justice, tailored services and individualized support in major areas of life implemented in as inclusive an environment as possible (Schalock et al., 2019).

'Give me a point of support and I will move the Earth'. – we are well aware of the physical sense of Archimedes of Syracuse's thought. All it takes is the right lever and a point of support to change the position of huge weights with a relatively small force. Metaphorically, when working with another person, especially one who is in a more difficult situation, the term Archimedes' point refers to his/her strengths (Grzegorzewska, 1969). Often they may not be obvious, not necessarily spectacular and their discovery (e.g. by an attentive teacher) can be a breakthrough in educational, rehabilitative work, improve the perceived quality of life. However trivial it may sound, it may be something seemingly small (e.g., a child's interests that are underestimated by others).

Discovering strengths can be a breakthrough in educational and rehabilitative work and improve the perceived quality of life.



2 Students with Intellectual Disability and the Internet

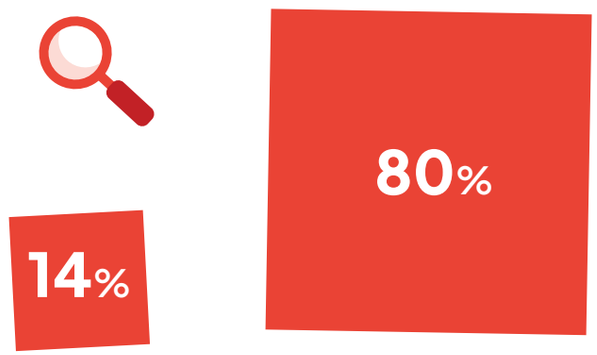
People with disabilities, especially those with intellectual disability, are at risk of digital exclusion (Chadwick et al., 2013); (Glencross et al., 2021); (Chadwick et al., 2022). Although the use of the Internet is increasingly widespread in this group (more and more people have access to the Internet and use it) (e.g., Chiner et al., 2017), the differences – compared to the rest of society – are still significant (Alfredsson Ågren et al., 2020). On top of this, the circumstances of young people with intellectual disability also differ from people with other disabilities (e.g., vision or mobility impairments), who are able to make decisions about themselves to a greater degree. Unfortunately, there is a lack of both diagnoses and solutions in the field of 'special needs media education' addressed to students with disabilities (Plichta, 2017). Symptomatically, more attention is paid to threats rather than opportunities resulting from the presence of new technologies in the lives of people with disabilities (Seale, 2014).

Research shows that compared to peers without disabilities, fewer young people with intellectual disability use the Internet, but they do use it similarly (mainly for entertainment purposes). In turn, they use it more often to play online games (Alfredsson Ågren et al., 2020). Using the Internet for pleasure (Livingstone et al., 2018) is important, but it does not exhaust the possibilities offered by the digital world. One of the biggest differences between teens with and without intellectual disability relates to searching for information online (14% and 80% respectively do this regularly) (Alfredsson Ågren, 2020). Young people with intellectual disability often have difficulty reading, and much online content is text-based and written in difficult language.

Teenagers with intellectual disability search for information online almost

6 times less often

than those without such a disability



Numerous Online Materials are Not Adapted to the Needs of Students with Intellectual Disabilityty

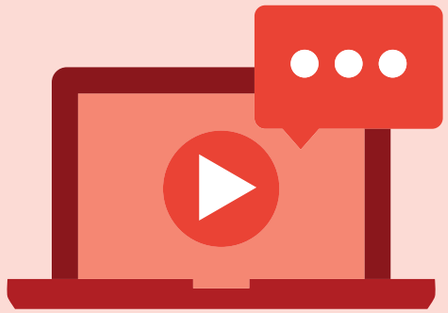
There is a lack of online materials on the Web that are tailored to Internet users with intellectual disability. Some children and adolescents with moderate (and sometimes even mild) intellectual disabilities cannot read, and even if they can read short texts, they do not always find their meaning. Examples appearing in available materials and good practices are saturated with difficult vocabulary or metaphors that those people simply do not understand. What we need is uncomplicated content, but also no infantilism in it.

Having worked in special education for 27 years, I have observed the downplaying of this topic. Not all teachers, educators and parents are experts in modern technology. Therefore, it is worth supporting their work and helping to develop the materials necessary for the digital education of their students and children.

Zyta Czechowska – therapist and special education teacher, Be Internet Awesome trainer

How can content be tailored to individuals with intellectual disability?

- → It would be great if the materials contained little text and more images.
- → Certainly, aids in cartoon form would work well.
- → Short videos with clear, simple messages would also be useful – especially those presenting situations from everyday life.
- → Mind maps, infographics and posters are always invaluable aids.
- → There is a lack of resources with enlarged fonts, but also with symbols, PCS or pictograms for people who use alternative and assistive forms of communication.



Dealing with rapid changes (e.g., hardware, updates) may be another challenge for people with intellectual disability. In the case of young people with intellectual disability, mastering procedural knowledge (e.g., remembering successive actions in a particular situation) is at a relatively good level. This can be advantageous in developing the skills required to use the Internet safely. However, it is worth remembering that this regularity is not necessarily true for all students with intellectual disabilities, who are an extremely diverse group.

Parents and caregivers typically decide whether children and teens with intellectual disability can access the internet. Therefore, it is essential to learn what they think about the perceived opportunities and risks of internet use (Cook et al., 2017). Therefore, educational and support activities for those who take care of students with intellectual disability are of crucial importance as well. A major challenge is adults' limited knowledge of this group of young people's digital experiences, including risky behaviours (Molin et al., 2015; Sorbring et al., 2017). It also happens that the more competent users of the internet at home are children with intellectual disabilities and not their parents (Plichta, 2017; Plichta, 2019).

Educational and support activities for those who take care of students with intellectual disability are of crucial importance.

3 Risks and Opportunities

Serious threats (e.g. engaging in risky behaviours), but also opportunities (e.g. improving social interactions) should always be considered when looking at various aspects of the online presence of people with intellectual disability.

Specific Risks

One threat is the Problematic Use of the Internet (PUI). This is defined as a behavioural disorder related to the abuse of electronic devices in order to use applications and websites (Tomczyk, 2019). PUI is diagnosed based on symptoms related to, among others, free time, school duties, social relations (e.g., neglecting school work, eating or sleeping due to using the Internet, ineffective attempts at limiting one's use of the Internet; Young, 2017). It may be a behaviour that is compensatory in character and may be a symptom of other difficulties (e.g., mental health issues) and a harmful way of coping with offline experiences.

The increased risk of people with disabilities, especially with intellectual disability, becoming victims of various types of negative actions by others should also be emphasized.

Research shows that Internet use, and especially the use of social media, can lead to difficult and often unforeseen situations (Buijs et al., 2017; Löfgren-Mårtenson et al., 2015; Sallafranque-St-Louis, Normand, 2017), for example:

- **Excessive use of the Internet,**
- **Exposure to inappropriate content,**
- **Online sexual solicitation,**
- **Cyberbullying and cybervictimization** (Chiner et al., 2021).

Excerpt from an interview with a special educator:

They get in touch with different people, they meet with them. This is also very dangerous, especially in the search for self-esteem, for the feeling that I am someone, someone as valuable as the so-called healthy people, and in the search for intimate relationships (Plichta et al., 2022).

Bullying and Young People with intellectual disability

When it comes to young people with intellectual disability, the most recognizable risk is becoming involved in conventional and online bullying. The victimization aspect is particularly important because there is a build-up of unfavourable factors: ease of getting harmed, social isolation, lack of support, limited coping skills and trouble communicating. Worse still, when it comes to research, reports about the harm experienced by people with intellectual disability are occasionally treated as unreliable (Plichta, 2010). In his typology of electronic aggression, Jacek Pyżalski (2012) distinguishes Electronic Aggression Against the Vulnerable as one type of aggression carried out with the use of new media.

Specific Opportunities

For people with disabilities, having more control over their own circumstances, autonomy and ability to participate in society are of great importance. Supporting the use of digital technologies can make it easier for them to take control of their own lives. For example, the digital environment can be an important tool for helping young people with intellectual disability in achieving various goals (e.g., expanding their social circles, enjoying a wider range of leisure activities). Therefore, the Internet can also be perceived as a tool used in the implementation of traditional (offline) tasks in school education (e.g., reading, writing and counting). This also applies to supporting their functioning in an out-of-school environment (e.g., adaptive skills, improved self-control).

In summary, internet use can also contribute to empowerment in various dimensions:

- **Individual** (e.g., by developing a sense of efficacy and acquiring new skills),
- **Interpersonal** (e.g., through the possibility of improving social interactions, expressing oneself and reducing loneliness),
- **Group** (e.g., through participation in online communities),
- **Civic** (e.g., through access to various information and services) – for people with intellectual disability, this dimension is the most difficult to achieve (Amichai-Hamburger, et al., 2008).

Supporting the use of digital technologies can make it easier for them to take control of their own lives.

4 Recommendations

Online experiences are closely related to traditional functioning. Therefore, some recommendations are universal in nature. For example, bolstering the self-esteem of students with intellectual disability and showing them respect helps protect them from both offline and online threats. It protects them against seeking attention and social acceptance in negative groups, which can have a negative impact. The same applies to supporting peer relationships.

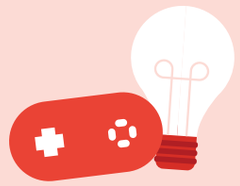
Starting with cyberbullying as one of the most commonly identified risks, its victims with intellectual disability do not always reveal the perpetrators. This is because they fear spoiling or losing relationships with people who have harmed them. As one parent said, the reason for this was the desire to maintain a relationship – 'friendship at all costs' (McHugh, Howard, 2017).

- Because there is a typically **significant degree of coexistence between traditional and new media aggression** (Pyżalski, 2012), they should be considered together in all school activities.

- **It is important to carry out activities specifically aimed at students with intellectual disability.** When working with victims of cyberbullying, activities with multimedia educational materials can be valuable (e.g. analysing the behaviour of film characters and their motivations, together with the students). This can be done using various educational materials (e.g., cartoons, social stories, films or texts written in plain language). In these, it is particularly useful to refer to typical situations from everyday life.

Children with intellectual disabilities fear spoiling or losing relationships with people who have harmed them.

Referring to Real-Life Situations in Working with Children with Intellectual Disability Thanks to the Be Internet Awesome Program



The Be Internet Awesome program allows you to combine education with play while providing guidance on solutions. Children learn to work with choice, emotions and rules. They connect skill and imagination and apply the resulting experience to real life. The BIA programme is the initial fun that leads to knowledge. We help our students with reading tasks, explain the meaning of words, etc. We let them make mistakes and find their own solutions. We teach them to ask for help. A wonderful experience!

Jana Vaňková – teacher at the School for the physically disabled in Opava (works with students with intellectual disability as well)

Additionally, one should consider the following:

- **Teaching coping skills in an easily memorable form** (e.g., using mnemonic techniques) should be a priority. This should refer to the basic principles of online activity, e.g., not disclosing personal information, knowing one's rights, what violence is, and how to behave when they feel anxious.

- **For young people with intellectual disability, online risks are far greater than the risks of peer violence** (e.g., financial fraud, susceptibility to advertising, sexual exploitation, engaging in risky behaviours). Therefore, a holistic approach is recommended in protecting and supporting those who are vulnerable. This not only means activities aimed at different levels (e.g., individual, classrooms or the entire school) but also addressing them to different people (e.g., teachers, support staff in schools, parents and students without disabilities).

- Because there are very few specific programmes aimed at people with intellectual disability, **it is worth seeking out particular elements of universal activities** (e.g., anger management training and relaxation training). Educational sessions will also be useful – for example: what bullying is, how it affects how we feel, why people carry out acts of violence, what to do when someone hurts us or hurts others (Majnemer et al., 2021).

- **Diagnosis as a starting point for educational activities.** This should relate to various areas. These includes: access to ICT for young people with intellectual disability, its accessibility (e.g., cognitive), kinds of use, online experiences (positive and negative), support, needs, and motivations related to the use of the Internet. Individual programmes should address such issues and record progress, actions taken, successes and barriers to digital inclusion. Such diagnoses are considered effective forms of combating digital exclusion. They should also comprise involvement in educational activities around peer aggression and bullying (e.g., describing such typical situations, their frequency, the roles played by individuals, interventions undertaken and their effectiveness). Thus, such diagnosis is not a form of clinical diagnosis, but consists primarily of gathering available information about the needs of young people, their online activities and identifying priority areas of support.

- **Setting priorities.** Usually, we do not have the opportunity to address all the important matters in schools, and we need to focus our efforts on a given person's most important needs. For some, that may be cybersecurity, and for others communication or social relations.

- **We all require someone to communicate with.** Of the three levels of Internet usage (technical, intellectual/cognitive and social), the last is the most difficult to achieve (Amichai-Hamburger et al., 2008). In schools, we should take various actions to help young people with intellectual disability establish and maintain social relationships. Supporting peer relationships can be achieved by using new technologies in tasks that require teamwork (e.g., co-creating digital class archives, albums and working on collective documents). The Internet makes many things easier, but we all require someone to talk to. The presence of other people and support are more important than the tool itself (Internet or mobile phone). However, the recommendation regarding the value of communicating with others through digital tools has its limitations. Given the unmet needs for social interactions and attention from others, particular attention should be paid to the risk of young people with intellectual disability engaging in undesirable environments, where they may seek acceptance without being aware of the potential risks.

The presence of other people and support are more important than the tool itself (Internet or mobile phone).

On the Importance of an Empathetic Teachers' Presence

To better understand the needs of children with intellectual disability, every teacher should have understanding, empathy and rational thinking. The most important thing, however, is to see this profession as a personal mission.

Jana Hřibovská – teacher at 17. listopadu Elementary School and Kindergarten, in Chomutov

Furthermore, applications and devices that we use are less important than what we want to achieve. The key question is what is the purpose of using the Internet and other technologies? Digital means are secondary to the goals.

For example, the use of new media can be an 'Archimedean point' for young people with intellectual disability or it can help reveal what that might be.

- **Less is more.** It is worth limiting the number of devices and apps used in favour of greater personalization that simplifies using them and searching for content (e.g., by properly arranging the number, appearance and size of icons/windows on the screen).

- **The 'by the way' approach** – integrating activities using the Internet into the everyday life of students with intellectual disability (e.g., during free time or travel). A small task performed regularly every day is more effective in improving digital inclusion than using the Internet once in a while or working on improving digital competencies in the classroom.

- **Valuing media experiences.** In today's life, media is equally important as 'non-media' and it is necessary to value their role in the lives of young people with intellectual disability (though without overestimating their importance). Showing a keen interest in the use of technology can be an empowering experience for young people with intellectual disability – asking about their favourite games or the websites they visited ('show me how you do it,' 'teach me,' 'tell me more about it,' etc.).

Flexibility While Adapting the BIA Curriculum to the Needs of Children with Intellectual Disability

To start, I introduced the BIA program to the pupils. At first, I showed them everything on the interactive whiteboard myself and then the students tried to solve the tasks on their own. If it was too difficult for somebody, someone else tried it, they took turns, or we skipped the activity and explained some parts only verbally.

Markéta Beránková – teacher at 17. listopadu Elementary School and Kindergarten, in Chomutov

- **Using new media together** is an opportunity to create a shared area of interest (e.g., naming different things that we find on the Internet and discussing them). From a relational perspective, using the Internet and modern technologies together is as valuable as walking, DIY (Do It Yourself) or other traditionally valued activities performed together with children.

- **Strengthening relationships with children.** Excessive control can give adults a false sense of security. Paradoxically, children who use the Internet less may be more vulnerable (they may be less aware of the dangers and use websites less well). Sometimes, children whose carers have installed parental control software are exposed to more risks than those whose carers did not (Kirwil, 2011; Livingstone, Haddon, 2009).

- **Using flexible methods and forms of work.** Schools are attended by diverse groups of students – students with different digital competencies, abilities, so-called individual educational needs and access to digital technology. In order to meet these different educational needs, including those of students who lack digital competencies, there is a need for flexible tools, methods and ways of working. This recommendation is in line with the advice of the UDL (Universal Design for Learning). The most comprehensive and flexible form of implementing priority tasks is required and may include, for example, digital storytelling to help develop both digital and social competencies.

5 Emerging Issues – New Trends

→ Increasing the Participation of People with Intellectual Disability in Research and Participatory Design

There is a growing need for more research regarding the use of the Internet based on the perspective, experiences and use strategies of young people with intellectual disability. Their participation in technological research will be essential and should help empower them in the long term (Safari et al., 2021). Involving people with intellectual disability in designing solutions (e.g., websites, applications and educational materials) is also a significant opportunity to meet their need for autonomy, proximity and competencies.

→ **Flexible Forms of Achieving Various Educational Aims and Psychological Needs** (e.g., enabling self-presentation, developing social, emotional and digital competencies).

Digital Storytelling

Digital storytelling is creating short videos combining sound, images, text, animations, etc. Creating digital stories improves the digital competencies of people with intellectual disability related to the technical processing of content. More importantly, in this process, a space for decision-making, cooperation and the selection of materials emerges. Depending on the competencies of the authors, the story can be created independently or with support. It can be a story about the individual, or the individual as a part of a larger whole (for example, a group or family). The theme of the story may have a broader (e.g., refer to life in general) or narrower scope (e.g. travel, interests, important people, etc.). For some students, it may meet more limited goals (e.g., developing and using digital competencies), while for others, it may have a wider scope (e.g., empowerment, building a sense of belonging or self-presentation) (Saridaki, Meimaris, 2018).

Examples of digital stories created by people with intellectual disability can be found, among others, on the Digi-StorID Project.

Photovoice

Photovoice can also be a useful tool (Booth, Booth, 2003; Wass, Safari, 2020). It is a method in which photography is used as a means of accessing the world of human experiences and presenting it to others as long as the participants give their consent. Participants photograph various aspects of their lives, and the photos can then be used to create albums and presentations, and serve as a starting point for conversations. Photovoice allows us to reveal personal perspectives, strengths and opinions, facilitates the communication of one's needs, deepens one's insight, etc. Furthermore, it can be used as a means to achieve educational goals or simply for fun. It can be used as a method of diagnosis, but also in research that involves people with intellectual disability.

6 Lessons from Emergency Remote Education

The COVID-19 pandemic has made daily functioning even more intertwined with new technologies and deepened the existing digital inequalities (e.g., Chadwick et al., 2022; Caton et al., 2022). It also revealed the 'uneven' use of the Internet – better for individual needs, worse in terms of school education:

> Excerpt from the interview with a special educator: (…) when it comes to all these social networks, i.e., Facebook, Messenger, WhatsApp, Instagram and Snapchat, children with intellectual disabilities are incredibly familiar with them, but they are unable to send their schoolwork through [when using] Teams

- It was easier for teachers to remotely implement didactic rather than general educational tasks. Most often, they said that remote learning deepens the differences between students rather than balances them (Buchnat et al., 2021).

- The successful use of new technologies in the remote education of young people with intellectual disability depended on the strong involvement of other household members and a milder degree of intellectual disability (Kversøy et al., 2021). People with intellectual disability (even those with more severe levels of cognitive impairment and higher support needs) who had support and had previously used technology, coped better during the pandemic (Amor et al., 2021).

- Digital inequalities not only affected young people, but also teachers.

- Excessive free time and greater involvement in the world of online activities also brought risks associated with social interactions with strangers.

The pandemic caused an increased interest in the themes discussed in this report. 'Being thrown in at the deep end' of technology and new media in education has increased the competencies of teachers (at least in terms of technology). The next step would be to seek new methodological solutions tailored to the online environment and digital tools (Pyżalski, 2019).

7 Further Reading

Vulnerable Children in a Digital World Report

The internetmatters.org report presents the results of research on the digital lives of children with special educational needs (10–16 year old) and their susceptibility to online risks.

The study asked:

- Does having special educational needs offline predict such needs online?
- Does each special offline need predict particular types of risk?
- Does the experience of risk predict further risks?

According to the risk factors, the following groups of young people were described: special needs in the family, communication difficulties, physical disabilities, special educational needs and mental health difficulties. In addition to the results, you can find insights for educators, for services, for safeguarding and for industry.

Walk a Mile in Their Shoes: Bullying and the Child with Special Needs (2013). A Report and Guide from AbilityPath.org.

This report reveals a greater frequency (and even prevalence) of harm to students with disabilities compared to young people without disabilities. Bullying targeted at the former is more chronic in nature and is caused by their disability. This also applies to online functioning. In addition to research findings and participants' statements, the report contains a Parent Toolkit and a Teacher Toolkit where you can find materials to help protect students with disabilities from violence.

ROBUSD (Reducing Bullying – Strengthening Diversity) Project Materials

→ Videos

→ Manual

The ROBUSD (Reducing Bullying – Strengthening Diversity) Project was aimed at the prevention of bullying (including cyberbullying) in educational settings, especially regarding students with special educational needs (e.g., with intellectual disability). Peer aggression has profound negative individual and social consequences and is a relevant problem in both education and public health. The main aim of the project was the elaboration of the innovative curriculum and the production of educational materials concerning the mechanisms and prevention of bullying. The knowledge behind the materials is rooted in research, as well as practical experience concerning special educational needs and peer group exclusion. The set of materials consists of a series of video presentations and e-books.

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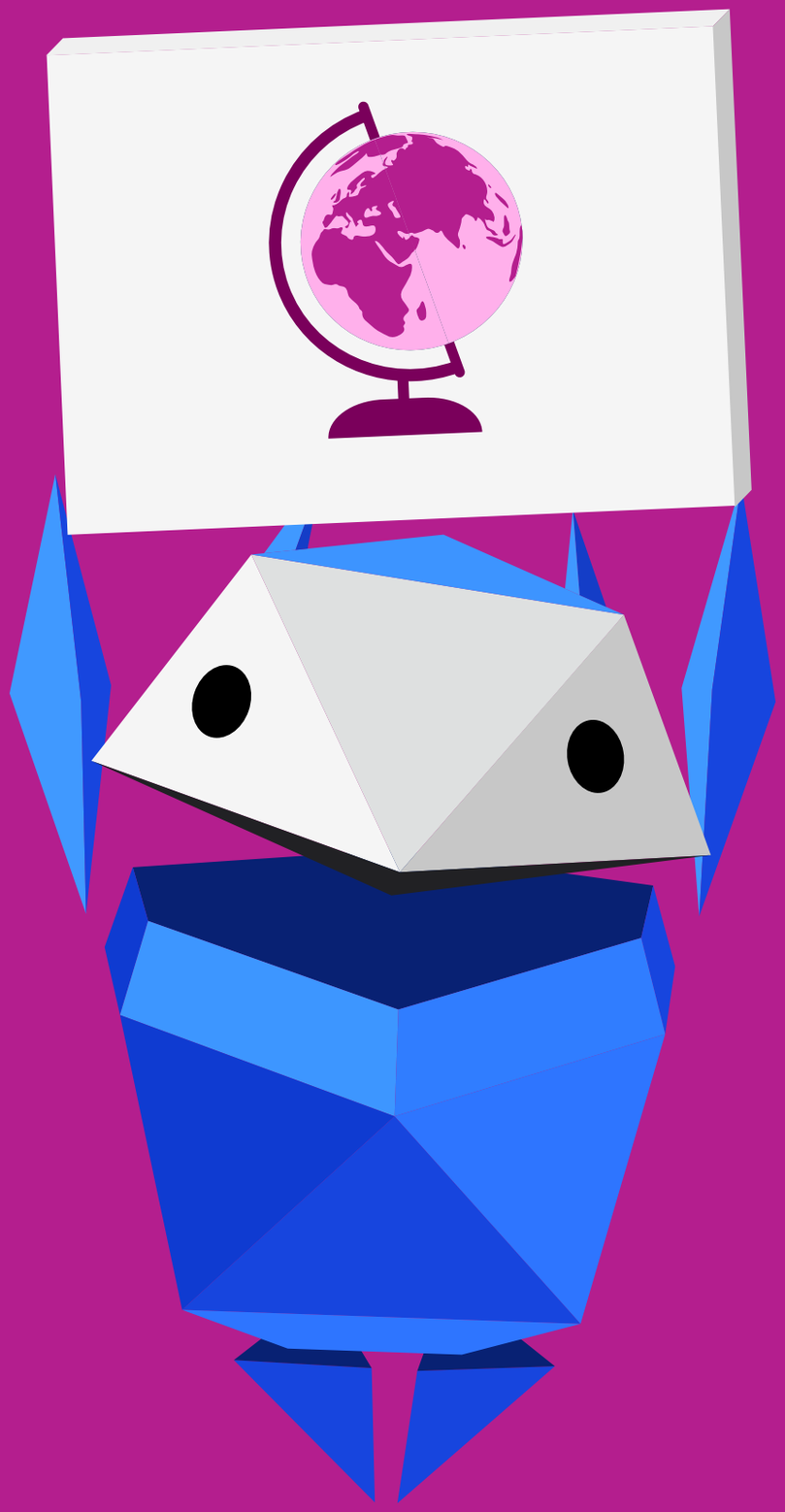


Children with Migration Experience and ICT

Anna Stokowska

School with Class Foundation

Be Internet Awesome

1 What is Migration?

The International Organization for Migration (IOM) defines a migrant as any person who is moving or has moved across an international border or within a State away from his/her habitual place of residence, regardless of:

- the person's legal status,
- whether the movement is voluntary or involuntary,
- the causes of the movement or
- the length of the stay.

However, though there is no single legal definition of a migrant, there is a clear definition of a refugee, i.e., a person fleeing armed conflicts or persecution. This is explained extensively on the website of the UNHCR, the United Nations Agency for Migration.

UNHCR data (updated semi-annually at www.unhcr.org) as of mid-2022 shows 103 million people forced to flee their country – representing about 1.5 percent of the world's population at that time. 36.5 million of them were children. One and a half million of them were born as refugees. The population of internal migrants is estimated at more than 53 million. This means one hundred and fifty million people are, to a greater or lesser extent, deprived of family or friends who could provide support in difficult times.

Those who leave their homeland have a difficult connection with their culture, traditions and language, unless they decide to keep in touch with their compatriots abroad. Those who flee armed conflict or persecution can also carry huge emotional baggage.

Can technology address these problems? It should, but not without the participation of experts creating suitable educational resources and not without top-down governmental and international support for education systems in countries hosting refugees and migrants. And not without the effort of all of us, which should lead parents of children who have experienced migration to appreciate the importance of education in the host country and not be afraid to send children to schools.

According to data for mid-2022, around 150 million people world-wide are, to a greater or lesser extent, deprived of family or friends who could provide support in difficult times.

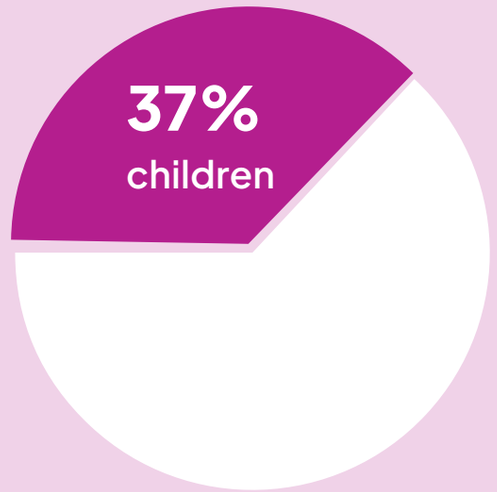
Estimates of the Number of Migrant children in Greece

Over the past decade, the number of minors who have experienced migration has increased significantly in Greece. As one of the major entry points in Europe for refugees and migrants, Greece has received more than a million individuals since 2015, with 37% of them being children.

Greece has received

more than **1 mln**

individuals since 2015



As of 30 September 2020, it is estimated that 44,500 refugee and migrant children live in Greece, including over 4,000 unaccompanied minors who are particularly vulnerable. Arriving in Greece without family members or guardians, unaccompanied children are particularly exposed to risks. In addition, many children have either been out of school for several years or even have never attended any kind of formal education.

Daskalaki E., Fragopoulou P., Vrohidou T.
– FORTH, Greek BIA team

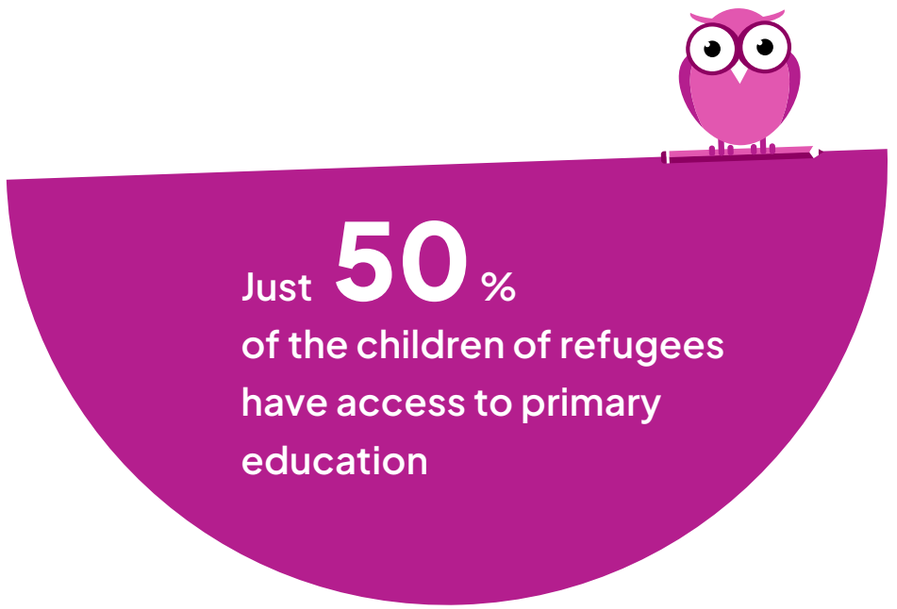
In 2020, **44,500** children

with refugee or migration experience lived there

2 Migrant Children and the Internet

Education is one of the important – but also difficult to implement – elements of the integration policy of most countries. Worldwide, just 50% of the children of refugees have access to primary education, compared with 90% overall. Just 1% of refugees enrol in higher education. EU directives require all Member States to include refugee and migrant children in their national education systems no later than three months after the date of submission of the application for international protection and to provide preparatory classes, including language lessons. Including refugee children and young people in national education systems is the most effective and sustainable way to meet their need for high-quality education (Dudinska et al., b.d.)

Meanwhile, access to education is fundamental because it affects people's perspectives in life, their economic and civic engagement, and – when it comes to migrants – even the degree of integration because it can help overcome various forms of discrimination and stereotypes. Therefore, educational infrastructure and preparing teachers for accepting migrants pose a major challenge.



Just 1 % of refugees
enrol in higher education

Access to Education in the Case of Migrant Children in Greece

According to the Ministry of Education, for the 2021–2022 school year, a total of 16,417 refugee students enrolled in the Greek schools and 12,285 attended classes […].

Although all children have a fundamental right to basic education, in practice the type, quality and duration of schooling offered to asylum-seeking, refugee and migrant children depend more on where they are in the migrant/asylum process than on their educational needs.

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Daskalaki E., Fragopoulou P., Vrohidou T. – FORTH, Greek BIA team

For example, let's suppose that the children of migrants and refugees have equal access to a local school and – in an optimistic scenario – have received language support, but their teachers fail to accurately assess the children's access to the internet and electronic devices. In that case, such students may still have significant problems with learning. For example, a study of migrants in Spain has shown that even if children have their own smartphones and can use Wi-Fi at school, the only access to the internet at home is often their parent's phone, and students themselves do not have access to a computer or other device that would allow for more creative and productive educational activities (Karrera, Garmendia, 2019). What is more – and this was also noticeable in the first months of working with Ukrainian students in Poland – mobile phones encourage accessing entertainment rather than educational content. They also do not offer many opportunities to improve one's digital competencies. Therefore, teachers shouldn't assume that because migrant students have mobile phones, they will be able to fully participate in ICT-supported education.

Additionally, in some cultures, there is a visible gap between boys' and girls' access to new technologies. The latter are often closely monitored by parents and often have to share their equipment with others. Girls may not be allowed to set up social media profiles (for example in the Roma community), while boys enjoy greater freedom (Karrera, Garmendia, 2019).

The digital skills of parents are also a significant factor. In countries where the popularity and availability of potentially harmful content online don't lead parents to educate themselves about online safety, children are left to their own devices when it comes to acquiring knowledge and experimenting. Following a move to a country with a more developed market and increased availability of low-quality entertainment there is some danger that such children will feel insecure in the digital reality.

Clearly, the social position of families – gender, ethnicity and social class – determines the digital competencies of its individual members (as well as access to digital devices and the internet). Migrant families very often (especially at the beginning of their stay in the host country) receive social benefits. This further emphasises their weak economic position. Because such factors can impede the development of digital competencies among families at risk of social exclusion, the need for digital education aimed at this group is significant. Of course, this process of empowerment should take place within the formal education system, but at the level of individual relationships, teachers should pay attention to it and be aware of the many dimensions of intercultural differences in this field.

In countries where the popularity and availability of potentially harmful content online don't lead parents to educate themselves about online safety, children are left to their own devices when it comes to acquiring knowledge and experimenting.

3 Risks and Opportunities

Beyond what is a derivative of cultural differences, when we talk about the role of technology in everyday life and the education of children with migration experience, we take into account the same risks and opportunities as when analysing the relationship with technology of children without migration experience. From access to devices and infrastructure (including affordable, high-speed internet) to digital competencies, most opportunities and threats are the same. Nevertheless, it is worth emphasizing that when it comes to migrants (especially adults), the coupling of not knowing the language of the host country (if that's indeed the case) with the great need for quick access to reliable administrative information and the one allowing to manage basic life needs can be a major barrier.

Specific Risks

Among the potential challenges for the use of ICT in the education of migrants and refugees, we can also include:

- **lack of infrastructure and devices for the use of digital resources** (or devices with insufficient educational potential);
- **inadequate psychological support** (for students, parents and teachers);
- **risk of insufficient quality control** and difficulties in determining the quality of educational materials and adapting materials to the existing level of student knowledge;
- **the risk of misunderstandings and/or cultural conflicts**;
- **lack of expert knowledge** about the pedagogical models best suited to particular situations.

Training Teachers of Migrant Children in Greece

The Greek Be Internet Awesome team at FORTH has set the goal of raising awareness among the immigrant community about online safety, positive online content, cybersecurity and protection from fraud. To this end, we have conducted workshops dedicated to educators and facilitators in schools and other venues where immigrant children participate. More specifically, we invited 40 social structures and NGOs that provide support to refugee and migrant children to a workshop where we introduced the 'Be Internet Awesome' program. The workshop was specifically designed for the educators and facilitators working with these organizations.

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– FORTH, Greek BIA team

Some of these challenges became obvious at the start of 2022 the arrival of numerous refugees from Ukraine to Poland. Research conducted in schools by the School with Class Foundation (2022) illuminates the situation of students and teachers in connection with the need to admit new children to primary and secondary schools.

> For many teachers, working with students from Ukraine was their first professional experience of working with students from other countries/cultures or an entirely new experience in terms of scale, the result of having little previous experience in this field (...) This is also compounded by potential issues regarding communicating with Ukrainian students. Almost 88% of teachers don't speak Ukrainian or speak very little Ukrainian, 11.4% of respondents know it poorly, and only one person in a hundred knows it well or very well.

The report also draws attention to the poor wellbeing of migrant students and the fact that teachers are not properly trained to work in multicultural classes (especially working with children experiencing war trauma). There are also some risks associated with the use of computers, smartphones and the internet. Lack of supervision in classrooms, not speaking the language and difficult peer relationships at the beginning of the stay, combined with enormous stress, can result in inappropriate and excessive use of online/mobile entertainment (as well as following news from the homeland, a country at war) and a greater risk of deteriorating mood.

This is also related to the varying levels of digital competencies among refugees.

> While many refugees have some technical knowledge, many also have a low level of digital competence and face an array of socioeconomic, language and cultural barriers that may hinder their use of technology. (…) People whose only link to the digital world is a smartphone (…) can connect with family members abroad, but may not know how to fill in and submit an online job application. (Potocky, 2021).

Specific Opportunities

Some of the above challenges can be addressed with the use of technology and appropriate digital tools. However, it seems that the most important task is maintaining the right balance between the support provided via ICT and developing relationships with teachers and students from the host countries. The role of a mentor is understood as crucial for each student's productive participation in technology-enhanced learning, and the effectiveness of ICT-based education also depends on appropriate teacher training. Thus, only well-designed educational programs will actually help migrants and refugees instead of further excluding them.

According to UNESCO, effective education programmes for refugees and migrants not only combine the use of technology with student-teacher interactions, but also incorporate different learning methods that can provide a flexible response to student needs. Refugees from environments where learning relies almost exclusively on lectures may be confused by seeing, for example, learning pathways based on students working together in groups (Joynes, James, 2018).

Information and communication technologies offer the possibility of delivering educational content almost anywhere, at a low cost. ICT can safeguard the continuity of curricula and data recording systems, e.g., assessments/grades or other information that can then 'follow students', help locate students who cannot attend school, and combine digital content with national curricula in the students' home country or host country. Importantly, the latter should be adaptable to the level and context of students, and implemented in accordance with the local curriculum. There is also a demand for materials in local languages and materials complying with international teaching standards.

In addition to facilitating learning, technology can also be helpful in training teachers, sharing materials and guidance, evaluating and documenting learning, and certifying educational achievement. Data collected digitally can provide means to quickly assess and map the educational situation of students and provide parents with basic information about their progress – and most importantly, this form of providing information allows for rapid (and increasingly better quality) translation with the use of online tools.

Finally, while ICT in education may encompass a range of technologies, its new applications in the context of migrants and refugees focus on the potential of two ways of using such technologies. First, personal smartphones, tablets, and other mobile devices are commonly utilized in mobile learning in both formal and informal contexts. Secondly, there are solutions for schools that combine portable devices, ICT and digital educational content for use in classrooms Especially if these resources are open (i.e., published under

Creative Commons licenses allowing them to be legally, freely and openly distributed and sometimes modified) they can be shared quickly and cheaply and can be adapted locally to the specific needs of a particular target group. Precisely because they are open, they can be incorporated into any digital learning platform.

Despite this potential, there is still a lack of evidence regarding, e.g., the success rate of ICT-assisted education in refugee centres or during major crises. Some researchers admit that in countries affected by crises, more and more educational programmes rely on information and communication technologies, but there is no solid evidence of the advantage of these tools over others (Joynes, James, 2018). Often, such evaluations cannot be carried out due to the difficult or unstable living conditions of refugees. Instead, the conclusions are based on observations and anecdotal evidence.

Opportunities

- → effective education programmes combining the use of technology with student-teacher interactions
- → delivering educational content almost anywhere, at a low cost
- → combining digital content with national curricula in the students' home country or host country
- → training teachers, sharing materials and guidance
- → giving means to quickly assess and map the educational situation of students
- → providing parents with basic information about their children's progress
- → utilizing personal smartphones, tablets, and other mobile devices in mobile learning
- → quick and cheap adaptation of digital open educational resources to a particular target group in crisis situations

4 Recommendations

Planning the education of children who have experienced migration should focus primarily on levelling the opportunities for access to good quality schools, trained teachers and the fast and effective learning of the language of the host country, which significantly reduces the risk of breaks and disruptions in education. Technology and digital assets can play a significant role in levelling the playing field, but the process still requires the help of parents and teachers.

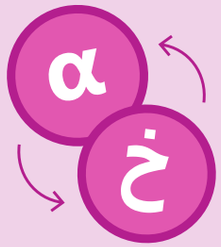
The main areas in which digital resources and ICT can help level the playing field are:

- learning a new language;
- maintaining contact with the culture, language and family in the country of origin;
- therapeutic work with children and families;
- expanding civic and law education pertaining to the host country;
- establishing and maintaining contact with others through games, discussions, forums, art;
- reinforcing empathy.

Technology has the potential to engage difficult-to-reach students, break down language barriers, improve engagement, facilitate the distribution of knowledge and personalized learning, and help displaced young people feel connected to communities already living in exile. Refugee children should have access to digital educational resources that would enable them to improve their skills, increase future employment opportunities and develop new contacts. However, educational materials should be offered in both online and offline formats, in order to reach more students and facilitate learning in different contexts.

Refugee children should have access to digital educational resources that would enable them to improve their skills, increase future employment opportunities and develop new contacts.

Ensuring Access to Educational Resources for Children Who Do Not Know the Local Language



We conducted a survey […] to determine the prevalent languages most widely spoken and comprehended by immigrant children in Greece, as well as the individual educational needs these children might have.

The survey revealed that **Arabic and Persian (Farsi) are the most widespread languages among migrant and refugee children in the social structures across Greece,** and highlighted the issues that are most relevant and need a response in the community of migrant and refugee children such as hate speech, cyberbullying, sexting, sextortion and scams.

With Google-Hellas, we translated the entire 'Be Internet Awesome' curriculum into the Persian (Farsi) language, since the Arabic curriculum was already available. Furthermore, we collaborated with interested NGOs to gather educational material that we had previously developed on the aforementioned topics of interest, to translate them into Arabic and Persian.

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– FORTH, Greek BIA team

School principals have a leadership role to play – they should provide students with the required support and services and demonstrate that the school is a welcoming place for all students. Teachers can start to make an impact by creating and maintaining a positive and welcoming environment as soon as children and youths with refugee experience arrive. Psychologists and educational counsellors can provide additional information and support in understanding the emotional needs of the student, and can help refer students to social welfare agencies and mental health centres. Numerous **free online courses on working with multicultural classes and students** lacking sufficient language competencies can help schools and local communities create such teams.

Examples of such courses and materials can be found, among others, on websites such as:

- 'Recommendations on ICT use in Teaching a Second Language to Illiterate or Low-Educated Migrant Students'
- a course on the 'Use ICT to Integrate Migrant Students in your Classroom'
- 14 Tips For Helping Students with Limited Internet Have Distance Learning
- projects and sources financed by the European Commission

Collaborating with Local Governments for the Purpose of Effectively Reaching Migrant Communities with the BIA Curriculum

We organized an event in Thessaloniki, in collaboration with the Municipality of Menemeni, where we invited the migrant and refugee children of the surrounding area. With the assistance of a translator (Greek to Arabic and Greek to Persian), we conducted an educational seminar about online safety based on the curriculum of the 'Be Internet Awesome' program.

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Note: This event has also been showcased as an impact story through a video in English and Greek (see the effects of the Greek's teamwork in the 'Impact stories' tab on bia4all.eu)

When welcoming refugees in our schools, it is also worth working to improve the qualifications of teachers in the field of formative assessment, which will greatly improve providing feedback to children who do not know the local assessment system and will only make progress after some time.

Digital resources and tools can also help with:

- gradually introducing new students to the school system,
- guided tours around the area,
- first contact between students (translation apps),
- informing new students about school events so that they feel included (also in national languages),
- introducing teachers and other school staff to the parents,
- providing students with accessible information about the cultural background of the newly arrived children.

Most of these can be created/implemented by the entire school community with the support of ICT (discussion groups, educational apps, online translation tools, etc.). Individual local government units also create useful resources for schools. Here is an example of resources (including student welcome packs in several languages) created by the Team for teaching foreign national children in Warsaw.

Schools could, for example, offer mentoring programmes for migrant children, additional ICT training for children and parents, or connect families in need of learning support with those who are able to provide it.

Another recommendation concerns the learning environment, which is understood as more than just the formal classes at school. Schools – which local communities often consider not only as hubs for education but also self-help and community interaction – could, for example, offer mentoring programmes for migrant children, additional ICT training for children and parents, or connect families in need of learning support with those who are able to provide it. In particular, it seems important for children to seek out mentors or tutors to help them learn. Children whose parents are unable to support them in learning at home (including due to the language barrier) are much less likely to graduate than those supported by adults.

Effective initiatives for the digital integration of migrants should focus on entire families, including beyond the school environment, where people of different ages with common needs or interests from the same community or family could learn together. These include:

- classes featuring plenty of practical activities corresponding with the interests of the students,
- additional classes containing little theory so as not to deepen language barriers,
- meetings to create educational materials (small modules, simple and clear tasks, videos, short texts),
- allowing independence from teachers and supporting independent learning,
- meetings on topics that are not sufficiently addressed in traditional school settings, based on a prior needs assessment (e.g., resolving conflicts, discussing cultural differences.)

However, these issues require further research – especially one that shows the effects of the interventions undertaken over the long term. All the above recommendations should be supplemented with recommendations **concerning the prevention of online violence**, which are described in detail in another chapter of this publication.

Moreover, an **ethical approach to the design of educational resources** is perhaps even more important. Children who have experienced migration are particularly exposed to unethical behaviour and abuse of their trust, are vulnerable in many ways and are subject to a number of extremely stressful procedures and situations. So, if we want to build educational programmes and create learning resources, they must be based on the highest standards of design focused on the end-users – their needs, concerns and competencies, as well as traditions and culture. Since many such projects are developed by (or under the supervision of) NGOs or government agencies, the risk of abuse is not as great as in the case of profit-generating entities. Still, such risks do exist and, therefore, there is a need for universal and well-considered standards and guidelines that can be applied when designing educational resources for children with migration or refugee experience.

There are additional benefits when the resources used in ICT-supported education are **open access**, i.e., published under licences allowing free and legal modification and further sharing. This means that they can be freely translated into other languages and encourages and strengthens the cooperation between all stakeholders. Such materials can be created in response to a particular situation, and can be easily updated and adapted later to suit a different context or circumstance.

When designing tools and resources aimed at supporting the education of migrant children, it is worth taking into account several further principles:

- migrants and refugees are a more diverse target group than home students, which is why the personalization and individualization of tools and resources play an even greater role,
- when possible, migrants and refugees should be involved in the design of educational resources (e.g., providing feedback on their usefulness and educational value to authors who should then take this feedback into account),
- migrants and refugees may need more direct contact with teachers than home students,
- educational resources for migrants and refugees should, on the one hand, relate to cultural similarities between them and the host countries, but also teach entire communities how to deal with existing cultural differences.

5 Emerging Issues – New Trends

The education of children with refugee or migration experience is an extremely delicate area. In addition to placing great emphasis on efforts to create equal opportunities for these children in access to good quality education, it should also take into account elements of multicultural education, support for tolerance, learning how to navigate the new reality, language learning and psychological support. All this means that one of the most important postulates for the creation of policies and – more directly – the educational materials themselves, should be the idea of interdisciplinarity.

In this context, an interesting trend may be the use of virtual reality to create and cultivate projects supporting the development of empathy, which is crucial when welcoming migrants (especially from other cultures). One project with such potential is '1000 Cut Journey' – an immersive virtual reality project created at Stanford University in which participants embody a Black male, Michael Sterling. Wearing VR glasses, we see for ourselves (though still in a safe space) how a boy experiences discrimination from the first grade of primary school. We then see him growing up and experiencing new forms of discrimination – in the sports team, on the street and at work. Thanks to this, we are able to see the 'other side' of social reality and realize that seemingly innocent remarks can be devastating for others and affect their entire later life. Imagine, then, a world in which each parliament building featured such technology. This would allow politicians to empathize with the social effects of any proposed new legislation before making any decisions impacting a given community.

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In their latest report, Anna Triandafyllidou and Usha George include a matrix that shows how different themes related to the lives of migrants can be supported by technology at different levels of stakeholder engagement (state, local organizations and individuals) – from creating new tools and resources, to presenting or interpreting existing ones (Arya et al., 2022). According to the authors, education is a field for the creative endeavours of medium-range entities (i.e. organizations and local governments) – i.e., those that are able to respond to the individual needs of migrants, but at the same time create a certain scale of action.

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In summary, education is an essential part of the efforts undertaken by governments and migration-related organizations. **Language competencies are one of the most common educational objectives, often alongside competencies related to employment and social skills.** Traditional information and communication technologies in the form of websites, seminars and online education and similar tools are used for this purpose and are mainly addressed to adults.

There are a number of services and support programmes aimed at newly arrived migrant and refugee **children**. These include counselling, various community activities and support groups, storytelling, and creative workshops. There are reports that indicate the value of expressive, engaging, and fun-based activities for the education of migrant and refugee children. However, not many studies have focused on the role of digital media and interactive entertainment in facilitating their adjustment. Some research suggests that digital media and interactive technologies do not have a statistically significant impact on educational outcomes, but many teachers use them anyway to deliver information in a more engaging way (Herold, 2019; Pane i in., 2014).

Computer games are also used to support children with individual educational needs, for cultural and behavioural learning, for developing cognitive skills and providing learning experiences in different fields and for different age groups. However, these areas have not been properly explored, and the findings drawn from existing studies are insufficiently conclusive. As in the case of 'ordinary' ICT-supported education, we must continue to **be attentive, empathetic and focus on creating relationships with children to meet their educational and emotional needs**.

6 Lessons from Emergency Remote Education

Despite many governments' strong responses to COVID-19, many students were left without sufficient help in March 2020. Access to online education has posed a challenge for about one in four secondary school students in Central and Eastern Europe, as well as Central Asian countries. At the start of the pandemic, one in ten students in this region had no access to the internet. Unfortunately, data on the actual lack of participation in school activities is difficult to obtain and compare. However, even inconsistent data suggests that children experiencing educational exclusion (including migrant and refugee children) were less likely to continue their education. In Ukraine, only 1% of students did not participate in remote learning, but 20% of pupils from Roma communities left school. Some countries took a decidedly offline approach – in Hungary, schools delivered homework and other educational materials to students' homes once a week, then collected them the following week. In Montenegro, schools provided printed materials for students who needed it. Television programmes and video lessons were provided for those who were most difficult to reach (Uzbekistan ran video lessons on state television in Uzbek and Russian, with translation into sign language; European Commission/EACEA/Eurydice, 2022).

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Teachers also had to learn how to use technology. A survey of about 1,000 primary school teachers in Poland revealed that 52% had some difficulties with using digital tools (Centrum Cyfrowe, 2020). Innovative solutions were required, for example: teacher networks and cooperation with students, who became a source of necessary knowledge for some members of the school staff. Still, the worst consequences of the pandemic were just around the corner. Standard forms of distance learning are directed at motivated and more independent students. Those who were previously unable to learn on their own encountered many obstacles. This was reflected not only in their progress, but above all in their well-being. During the remote learning period, as home environments and parental support became increasingly important, disadvantaged students risked continuing to stay behind. In Ukraine, when boarding schools sent students home, social workers were instructed to keep in touch with their parents and even visited to ensure social and sustenance needs were being met. In some countries, some students were left without pedagogical support, and the responsibility for the continuity of education of students with individual needs rested solely with the parents.

All these struggles have exposed the pre-existing problems of many educational systems. If we had not noticed children excluded in terms of access to education before, it was now difficult to ignore this fact. The COVID-19 crisis has shown that equal access to education for all during the pandemic is not just a matter of solving the issue of digital exclusion. Education systems have been verified for their ability to ensure continuity of education at many levels: adaptability of curricula, ways of teaching and grading, teacher training and support for households, especially regarding students with learning difficulties and those lacking motivation.

Still, one of the most important lessons from the pandemic – and one that is important in terms of education involving children who have experienced migration – is the need to focus on the socio-emotional aspects of children's lives. Many pedagogical communities have understood that taking care of the mental well-being of children allows them to grow into independent, self-sufficient, motivated and content citizens. Many teachers have seen their students in a new light and this helps them to adapt their methods to welcome refugee and migrant children today.

Taking care of the mental well-being of children allows them to grow into independent, self-sufficient, motivated and content citizens.

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