



Teachers' perceptions of the impact of technology on children and young people's emotions and behaviours

Annita Ventouris^{a,*}, Constantina Panourgia^b, Sarah Hodge^b

^a School of Humanities and Social Sciences, University of West London, UK

^b Department of Psychology, Bournemouth University, UK



ARTICLE INFO

Keywords:

Technology
CYP
Teachers' perceptions
Emotions
Behaviour
Mental health
Wellbeing

ABSTRACT

The development of new technology and the central role it plays in current times has allowed an increasing number of children and young people (CYP) to use it on a daily basis for academic, entertainment, and socialisation purposes. Although the role of technology in affecting CYP's mental health and education is well researched, there is a need to investigate the teacher perspective, considering educators' pivotal role in supporting CYP's wellbeing and learning. Understanding the teacher perspective can provide important information about practical issues surrounding the use of technology in education and can provide insights into how their practices are affected by their views. Therefore, the aim of this study was to investigate teachers' views on how use of technology affects CYP's emotions and behaviours. An exploratory, qualitative research approach was taken, and semi-structured interview data was collected from eight teachers and analysed thematically. The results suggested teachers recognised the importance of technology as a learning and teaching tool, as long as it is used in a balanced way; there was also a consensus on the negative consequences of the 'socioeconomic digital divide' on CYP's emotions and behaviours. However, they held conflicting opinions on issues related to the impact of technology on socialisation processes, self-esteem, and the demonstration of specific behaviours like social isolation. Teachers' perceptions can inform strategies for using technology effectively in the classroom and for supporting CYP's mental health and wellbeing, which, now more than ever, should be at the forefront of whole-school approaches.

1. Introduction

As technology is advancing at an extraordinary rate, usage of digital devices is on the rise among children and young people (CYP), who consider them as an essential and valuable part of their everyday lives. Having access to technology and digital devices allows CYP to connect with their peers, to entertain themselves, do their homework and stay up to date with their academics. However, spending a considerable amount of their time on digital activities has caused concerns among parents, educators, and society in general, over the impact it may have on CYP's development and wellbeing.

Responding to these concerns, research in the last years has focused on exploring the relationship between wellbeing and technology usage in CYP and the effects of technology on CYP's learning and academic achievement, yielding contentious results; some studies emphasise the opportunities for CYP to pursue challenges and activities valuable for their healthy development (e.g., Przybylski & Weinstein, 2017) and some others focus on the negative effects it may have on children's social development and wellbeing (e.g., George & Odgers, 2015). However, most of the research conducted is correlational, shows small effect

sizes, and the underlying mechanisms of these outcomes are not very precise (Gottschalk, 2019).

Covid-19 has highlighted the role technology plays in everyone's lives and has brought to the fore issues related to CYP's mental health and wellbeing. Lockdown and e-education have increased the frequency with which CYP use forms of technology, raising further questions on how their emotions and behaviours are affected. Considering teachers' pivotal role in supporting CYP, it is important to investigate their perceptions of how technology and digital activities may influence CYP's emotions and behaviours. Although there is an abundance of studies on teachers' perceptions of technology use in schools, there is limited evidence on how teachers view the use of technology by CYP and how it affects their emotions and behaviours. Therefore, this study contributes to the relevant literature and the current understanding of how teachers' practices are influenced by their perceptions, feelings, and opinions. Understanding the teacher perspective can provide important information about practical issues surrounding the use of technology in education as a tool for enhancing CYP's wellbeing. Teachers' opinions can also be useful in the selection and implementation of pedagogical methods and

* Corresponding author: School of Human and Social Sciences, University of West London, Bostor Manor Road, London, TW8 9GA, UK.
E-mail address: annita.ventouris@uwl.ac.uk (A. Ventouris).

intervention programmes using digital tools, aiming at supporting CYP's mental health and wellbeing.

2. Effects of technology on CYP

For the purposes of this study, the terms 'technology' and 'digital activities' are used in broad terms, in line with [Kardefelt-Winther's \(2017\)](#) suggestion, to include all digital devices, such as mobile phones, computers, tablets, as well as the activities that CYP engage in via these devices. The ever-increasing presence of technology in CYP's lives and its effect on their behaviour and emotions is discussed below, drawing evidence from international literature in the field, starting with the educational uses of technology.

2.1. Technology and education

Over the years, teachers' perceptions of the use of technology in the classroom have been investigated, with findings suggesting it is an essential and important part in the education of CYP (e.g., [Bhargava et al., 1999](#); [Hong & Koh, 2002](#)). Conversely, research in the US also revealed factors hindering the use of technology in classrooms by teachers, including resources, institutional and administrative support, training and experience, and attitudinal/personality factors (e.g., [Brinkerhof, 2006](#)).

Using digital technology outside school has been found to improve school readiness and academic achievement in CYP, with research evidence from Australia suggesting that home computer ownership increases the likelihood of educational attainment ([Beltran et al., 2008](#)). However, families with low socioeconomic status cannot always financially invest in technology, as they need to cover for the immediate family needs, resulting to children being raised in less technologically stimulating environments ([Evans, 2004](#)). Hence, the integration of technology in education is essential.

Other research evidence, such as from the US, demonstrates that time spent engaging in technology, may have negative effects on CYP's learning, including difficulties with paying attention in class and problems with visual memory and imagination (e.g., [Swing et al., 2010](#)). Yet, students' attitudes towards learning have been reported to become more positive, when teaching materials are enhanced by technology ([Donmuş & Gürol, 2014](#)). In addition, data from the 2018 Programme for International Student Assessment (PISA) reported, among other, that students who intensely engage in technology and students, who do not engage at all in such activities, perform better than those who use digital technology moderately ([OECD, 2019](#)). According to the same report, technology in the hands of teachers is associated with higher scores than technology in the hands of students, while technology is associated with worse results in lower-performing schools ([OECD, 2019](#)).

The educational use of social media is one of the latest ways technology is integrated in the curriculum, with research reporting conflicting views on the matter. For example, teachers in the Netherlands reported a lack of knowledge in enhancing their teaching materials with social media ([van Acker et al., 2011](#)), whereas a relevant literature review on teachers working in Higher Education demonstrated their fear of losing control over students ([Tess, 2013](#)), who can be easily distracted ([Piotrowski, 2015](#)). On the other hand, school principals across the US and Canada stated that social media allow them to form better relations with the school community and supported disseminating their vision ([Cox & McLeod, 2014](#)). Students found the integration of social media in their education interactive and easy to use ([Manasijević et al., 2016](#)), with Facebook and Twitter increasing their motivation ([Cole et al., 2013](#)).

Videogames have also been used as educational tools to enhance the learning process, but there is debate about their effectiveness, as conclusions are inconsistent. [Ke's \(2009\)](#) review of 89 articles indicated that games are effective for learning, whereas other research found that they are not more effective than traditional methods at all ([Clark](#)

[et al., 2016](#)). Nevertheless, videogames have been reported to be effective when supplemented with other pedagogical methods and played in groups, but not more motivating than conventional methods of teaching ([Wouters et al., 2013](#)). Research in the US suggests they support creativity ([Jackson et al., 2012](#)), play and the related cognitive, emotional, and social development ([Granic et al., 2014](#)).

2.2. Technology, emotions and behaviours

Perhaps the most justifiable concern regarding the effects of technology on CYP is related to the exposure to various degrees of violence, including cyberbullying and violent video gaming. It is well documented that cyberbullying can have both short and long term impacts on CYP's mental and physical health and also on their academic progress and achievement ([McDougall & Vaillancourt, 2015](#)). A large-scale study of students in Stockholm reports that emotional distress, suicide ideation and attempts, externalizing problems, such as substance abuse and criminal behaviour are also among the severe consequences of cyberbullying ([Låftman et al., 2013](#)). The exposure to violent video game play also raises similar concerns, as a number of studies suggest that it may increase hostility and aggressive behaviours, whilst decreasing empathy and prosocial behaviours (e.g. [Williams, 2013](#)).

Research on the perceptions of educators on the impact of technology on CYP's emotions and behaviours is limited. Much of the previous research has looked at how technology affects CYP's social and emotional development or teacher perceptions of the integration of technology in the classroom; therefore, there is a gap in the literature related to teachers' perceptions of technology use in CYP and its developmental implications. However, in the early years field, relevant research revealed the concerns of educators over the use of technology and digital media. Educators believe that technology can expose children to inappropriate content and hinders their socialisation processes, as it leads to isolation, having consequently a negative impact on their social and emotional development ([Donohue, 2015](#)).

CYP's frequent engagement with social media has also been related to other negative outcomes, as it is often associated with anxiety and depression ([Hoge et al., 2017](#)). Figures demonstrate that 71% of 12-15 year olds in the UK have a profile on social media ([Ofcom, 2020](#)), whilst at the same time mental health disorders in children aged 5-15 have risen ([NHS Digital, 2018](#)). A decrease in wellbeing, caused by feelings of envy, was also observed in a study with undergraduate students in the US ([Verduyn et al., 2015](#)), as social media assists in the creation of an environment in which individuals present ideal versions of themselves and their lives; this might lead to feelings of inadequacy among users as it promotes upward (negative) social comparisons ([Steers et al., 2014](#)).

A number of studies have found no correlation between wellbeing and usage of digital technology (e.g. [Jelenchick et al., 2013](#)). In fact, many studies demonstrated the benefits technology might have on CYP and the opportunities it provides to learn, socialise, enhance their creativity and broaden their horizons (e.g. [Lowood, 2008](#); [Byrne et al., 2016](#)). In their study with more than 50 families in the UK, [Plowman and McPake \(2013\)](#) found no evidence from parents that technology affected their children in a negative way, in terms of behaviour, learning or health. The UK Millennium Cohort study yielded similar results on video games as they were not associated with any emotional symptoms or problems with peer socialisation and prosocial behaviour ([Parkes et al., 2013](#)). In contrast, video gaming has been linked with positive outcomes such as enhanced working memory performance and task-related cortical activity ([Moisala et al., 2017](#)), as well as training of emotional skills like self-regulation practices ([Gabbadini & Greitemeyer, 2017](#)).

Concerns over technology intervening in CYP's healthy socioemotional development and formation of peer relationships have been prevalent over the years. It is observed that children interact more with their phone than with each other, with evidence from the US showing that adolescents using social media heavily are three times as likely to feel socially isolated than their counterparts with lower social media

use (Primack et al., 2017). However, there is evidence suggesting that digital technology and online communication contribute positively to the quality of friendships CYP have, probably because CYP find it easier to talk about personal/sensitive issues online. For example, a study of Israeli adolescents and young adults showed that adolescents with social anxiety disorders, struggling with face-to-face social interactions, may find support in virtual communities which allow them to practice their social skills, thus gaining more confidence (Ziv & Kiasi, 2016). Evidently, attempts to identify the relationship between digital technology and psychological outcomes are inconclusive.

3. Rationale and research questions

Considering the lack of consensus on the effects of technology on CYP's emotions, and behaviours, societal concerns over the rising use of technology among CYP are mounting. Education and child health professionals, as well as parents/guardians, might be hesitant or uncertain as to how to integrate technology in CYP's everyday lives, highlighting the need for clearer, consistent and evidence-based guidelines and policies. Teachers' role in supporting CYP's mental health is pivotal and further accentuated by the new relationships and health curriculum (DfE, 2019) which places statutory responsibility on state-funded schools to promote wellbeing for all pupils. Investigating the teacher perspective can help in understanding the specific educational factors/contexts in which technology use might have positive or negative impacts on CYP.

Teachers' discourses can also point to specific recommendations regarding the integration of digital technology in pedagogical methods and the implementation of intervention programmes aiming at supporting CYP's mental health, as recently highlighted by research (Henriksen et al., 2021). These can only be effective if they are based on teachers' input and experiences, as they can offer an accurate picture of the situation. As qualitative data have the advantage of providing deep insights into the participants' thoughts and reflections, they might reveal how teachers' perceptions lead their practices in relation to supporting CYP's mental health. In the times of Covid-19, this support is needed more than ever; therefore, the aim of this study is to examine the following research questions:

- RQ1: To what extent do teachers believe technology affects CYP's emotions and behaviours?
- RQ2: To what extent and in what ways do teachers believe engagement in digital activities influence CYP's learning?

4. Methods

A qualitative, exploratory approach was employed as it allows participants to provide substantial reflections on their experiences. This is because the great majority of exploratory research is conducted to investigate an issue in order to develop insights about its underlying nature, which is mainly revealed through the participants' understandings, meanings and practices.

4.1. Participants

Semi-structured online, individual interviews were used to collect data from eight teachers, combining both purposive and snowballing sampling techniques. Pre-existing networks assisted in selecting participants who have experience with the phenomenon of interest, in line with the definition of purposive sampling (Cresswell & Plano-Clark, 2011), and also assisted in initiating contact with some other teachers. This favoured the selection of 'snowballing', as an additional sampling technique, as the key respondents gave the name of other potential participants (Vogt, 1999). The sample comprised a representative and diverse group of participants, as it included teachers of different backgrounds and ages (ranging from 26 to 53 years old), teaching in primary, secondary and SEN schools in various parts in the United Kingdom. It also

included teachers who graduated recently and teachers who have many years of professional experience (ranging from 1-29 years). However, seven of the participants were females and one was male, reflecting the overall gender imbalance in the teaching profession.

The online, semi-structured interviews employed open-ended questions, which were mainly chosen because of their flexibility. Interviews were all conducted online, recorded and transcribed. All participants were digitally literate and familiar with online communication and interviews occurred in convenient conditions for the participants. It is worth noting that although the number of participants in this study was small, in-depth interviews allowed for rich descriptions of the participants' perceptions and opinions.

4.2. Data analysis

Data collected was analysed using thematic analysis, following the six-step process set out by Braun and Clarke (2013): familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining/naming themes, producing the report. This method is suitable for this type of research, as it assists in understanding the views, experiences, thoughts and perceptions of participants, which is the main aim of this study.

Three thematic categories and six subthemes (cross-validated by the researchers) were generated from the interview data with teachers, presented in Table 1. A supporting narrative analysis is presented in the next section. The identity of the subjects is protected by the use of pseudonyms, as this study adheres to the British Psychological Society's Code of Ethics and Conduct (BPS, 2018).

5. Results and discussion

5.1. Technology in education

Teachers' perceptions of the use of technology in education centred on its value as a tool; technology was mainly described as an integral part of both teaching and learning, a tool which enhances teachers' practices and students' learning. This is reflected in the sub-themes *perceptions of purpose* and *perceptions of effectiveness*.

Participants held positive views in relation to the integration of technology in their teaching, influencing their practices in the classroom. Most teachers admitted that technology was not part of their initial training, but a development that they had to adapt to. Online tests, video games, apps to set homework, speech to text programmes and online education packages were among the tools teachers mentioned as examples of technology used to enhance the learning process. Evaluating the use of these tools, teachers in this study concluded that they did not change their role as a teacher, but they have improved the quality of teaching:

It is really important for practitioners to develop their own skills set to make sure they can use available technology in the classroom (Lea).

Research confirmed the importance of technology skill training for teachers, as the more teachers are involved in setting up classroom technology, the more likely they are to use it for instructional purposes (Royer, 2002). Considering the interruption of face-to-face classes in March 2020, because of Covid-19, and the unexpected situation educators found themselves in, many reflected on the importance of training on rapidly developing digital technologies:

We need to keep up with the times and if there is something this pandemic taught us, is that not all of us are keeping up... one-off training is not adequate, schools need to invest in continuous professional development activities related to technology (Mary).

Teachers considered the integration of technology in education quite effective, especially when applied in a balanced way and does not crowd out any other learning activities:

Table 1
Table of themes for teachers' perceptions.

Thematic Category	Subtheme	Illustrative quote	Illustrative quote
Technology in Education	Perceptions of purpose	<i>I feel that it is the expectation of teaching now, rather than it not being there.</i>	<i>It is what the children are used to, and it engages them more - it is a useful tool that can add to our teaching.</i>
	Perceptions of effectiveness	<i>It can be effective if used in the right way - taking into account factors such as the level of students and general engagement with tech activities.</i>	<i>For some of our dyslexic pupils you've got the talk-to-print apps that support them with their writing.</i>
Lack of Access to Technology	Digital division	<i>There is a big divide between those who have technology, so the people who can afford to have a chrome book or a laptop or whatever at home</i>	<i>There is a stigma attached to children whose parents cannot afford the latest i-phone.</i>
	Educational Loss	<i>They rely on their phone for everything and sometimes they can't access certain apps and of course they can't write word documents.</i>	<i>They only have a phone with a cracked screen to access it on - so they can't get onto their work and they are getting really distressed.</i>
Changes in CYP's behaviour	Expression of emotions and self-esteem	<i>Technology offers them tools to succeed in school tasks and feel proud of what they have achieved.</i>	<i>Social media affect a kid's ability to empathise with others, as they use them to promote themselves.</i>
	Socialisation Processes	<i>They don't know how to have proper conversations with their friends. They don't know how to resolve anything because it's easy to be mean behind a screen and not have to resolve it.</i>	<i>Socialising online can be helpful for shy and withdrawn students, as they can feel they are part of a group.</i>

Technology is not negative in the classroom, as long as you get a good balance and that the children are still having lots of opportunity to discuss, communicate and socialise and it's not all based around a screen (Tricia).

Teachers' accounts on finding the right balance between digital and non-digital learning activities reflect current debates, as blended learning approaches were abruptly implemented in many schools. According to research, teachers use a wide range of engaging strategies in their classroom, compared to a minimal use of online strategies, reflecting their views on each delivery method (Jeffrey et al., 2014). Bowman et al. (2020) recognise that many professional development programmes for teachers are effective at improving the way teachers incorporate technology in the classroom; however, they do not address issues related to teachers' value beliefs toward technology integration in the classroom. Covid-19 proved that novel types of teaching and learning are achievable; in fact, some of them are here to stay, as institutions all over the world prepare for the 'new normal'. Therefore, professional development training addressing teachers' values toward the implementation of technology in the classroom is crucial, as it affects the quality of student learning, which is determined by what they actually do when engaging in activities designed by teachers (Jeffrey et al., 2014).

As many teachers mentioned in the interviews, CYP do learn through digital tools and activities, but a primary school teacher, expressed her concerns on the 'love of books':

I would worry about the love of books and think it would be very much ok to say 'use a book or a laptop to find your information' - but they will go to that laptop, whereas we very much want to nurture the love of books (Diana).

This highlights the importance of exposing students to multimodal literacies, where meaning is communicated through combinations of two or more modes (Walsh, 2010) in order to acquire strong information literacy skill sets. Along with digital skills, it is important for educators to encourage a 'love of books' and a 'love of reading' across all formats. This is because children and young people are exposed in a multimodal world where information is presented in various ways and therefore, they need to learn how to communicate effectively. For this to be achieved, it is suggested that CYP need to be taught how to question and critically analyse this information, using a variety of meaning modes.

A consensus was gained from the interviews related to the positive effects of technology for SEN learners, including the benefits of using educational programmes, apps, and tailored mainstream technology. For example, learners with disabilities, who improved academically and emotionally, were able to become more confident and independent:

We are using programmes such as Read&Write and they had a major impact on students with dyslexia or other needs, from an academic point of view. They don't see me as the only source of help anymore, as they can regulate their own learning, becoming more independent (Diana).

As technology is fast developing and digital tools become increasingly efficient, it is crucial to use them in a way that positively impacts not just SEN learners, but all students. An issue that emerged during our conversations with teachers considered the suitability of some technology tools and the way they can be used with specific groups. Lea described her experience of using an education package, specifically developed in line with the curriculum (Minecraft):

They (*the students*) were already quite involved in Minecraft outside of school and so bringing it into school was actually really damaging because they couldn't get their heads around the fact that my focus for the use of Minecraft was different to their focus of their use of it at home (Lea).

Reflecting on this experience, Lea noted that she had chosen the wrong group of children to use this tool with, as students seemed very stressful when they were engaging with it. She also commented on the need to consider students' individual characteristics when looking at the different uses of technology. This is a point raised by many teachers in our conversations, dismissing the 'one size fits all' approach. As Mitchell (2014) posits, teachers should develop a repertoire of strategies nestled within their professional wisdom and knowledge of the characteristics and needs of students; this is also supported by the Department for Education, as during the period of the first lockdown in the UK, there was guidance on creating educational activities in a range of formats, so that they are accessible to all (DfE, 2020).

5.2. Lack of access to technology

Participants had the opportunity to reflect on issues related to remote teaching and learning; this includes the social inequalities between stu-

dents accentuated by the lack of resources to access technology, and the overall impact this has on students' academic achievement.

The so called 'digital divide,' that is the gap between those having internet access and those who have not, has been researched extensively on a global scale. However, the advent of the pandemic has brought it to the spotlight once again, revealing social inequalities in education and creating a divide between those who have the necessary means to get educated and those who do not have them. This is reflected in the first subtheme of this category (*Digital Division*), which revealed teachers' perceptions of social inequalities among their students:

The lockdown strategies are actually increasing digital inequality, as it is a challenge for poorer families trying to find the means to access online teaching ...not all families can afford Wi-Fi (Mia).

Children from lower socioeconomic backgrounds are less likely to have access to online learning, provided by their schools. This is mostly on account of not having the necessary technology, including devices, or even internet connection. This view was justifiably prevalent among teachers, as in a study conducted by [Montacute and Cullinane \(2018\)](#) in the UK, more than a third of parents with children aged 5-16 reported their children do not have devices, such as a laptop or a tablet, to access internet at home. Hence, illustrating how access to technology is influenced by socioeconomic status.

Teachers expressed concerns that the online delivery might be unfair, as it can only benefit a specific portion of students. A teacher working in a deprived area mentioned that 40% of the students in her school can only access online materials through their parents' phones. Reflecting on this, she mentioned she hasn't been able to rely on students printing things off or seeing things on a larger screen:

It has been quite tricky setting work because we have had to set work that gives parents ideas to do with their children or we can show them an image on their screen and give them a question and ask them to write something about it (Mary).

On the other hand, teachers in schools attended by students from privileged backgrounds were confident students had access to technology at home and therefore can complete homework online. In our discussions with teachers, this view was linked to the differences between schools of high and low socioeconomic status, with many teachers reflecting on their own experiences of working in both settings. Diana, who used to work at a technologically advanced school in a privileged area, told us she felt like she was 'in the dark ages' when she started working in a school in a deprived area with only a whiteboard and a pen to write on. Teachers in similar situations highlighted that policy makers need to address the issue of technological resources in underprivileged schools, as it is currently further accentuated by the pandemic, increasing educational inequalities.

Teachers also referred to the *Educational Loss* (second subtheme) of students from working classes during the lockdown, expressing concerns that the attainment gap between advantaged and disadvantaged students is widening. Focusing on Covid school closures, Sarah mentioned:

Middle and upper-class students usually have parents who are educated and can support them; or online private tutors and a home allowing for a set-up for online education, so their learning might not be affected to the degree poor children's learning is (Sarah).

Overall, the teachers thought the 'socioeconomic digital divide', brought to light by the pandemic, as a large factor affecting students' attainment during this period. Discussing how they can bridge this learning gap, teachers reported feelings of helplessness, as they thought they are unable to assist some students with their academic progress:

I spend a lot of time on the phone explaining stuff to children who cannot attend online classes. I feel there is nothing else I can do. It is exhausting. They cannot catch up this way, they know it and I know it and this is very distressing for all of us (Andy).

Discussing the ways they can help, other teachers focused on the role of parents and the quality of collaboration they have with them. However, they highlighted the challenges involved when dealing with working-class parents, including the low educational background of some, which does not allow them to offer enough support to their children. They also mentioned difficulties in getting hold of them, as these parents might be required to take on more than one jobs to support their family. This is demonstrated in research on the impact of school holidays on children from low-income families suggesting they contribute to the widening of attainment gaps between economically advantaged and disadvantaged students ([Stewart et al., 2018](#)). Considering the long-term effects of the pandemic on students' achievement, teachers' possible solutions to closing the attainment gap included practices that are at the institutional and governmental level. They clarified there is not much they, as individuals, can accomplish at this time. Suggestions included, among other, governmental funding to schools in deprived areas, establishing blended teaching in such schools and providing laptops for home use along with hard copies of the online resources to students who have no internet connection.

A Sutton Trust report on the subject ([Cullinane & Montacute, 2020](#)) stated that even if all possible steps were taken to minimise the consequences of school closures on the attainment gap, it is quite likely that disadvantaged children will be affected the most, suggesting a longer-term impact of the pandemic and lockdowns. This may pose additional challenges to teachers, as they need to reconsider their practices and their role within this newly established socioeconomic digital divide.

5.3. Changes in children's behaviour

Participants expressed conflicting views on whether technology is harmful or beneficial to children's wellbeing/overall development, in line with research in the field (e.g., [Kardefelt-Winther, 2017](#)). The theme *Changes in Children's Behaviour* encapsulates these views.

The subtheme *Expression of Emotions and Self-Esteem* refers to teachers' ideas on whether technology has affected the way CYP express their emotions and influenced the development of their self-esteem. Our discussions mainly centred on the usage of social media and video games by CYP. Teachers seemed to disagree on how engagement with these activities can affect the way children express their feelings, with some focusing on their positive aspects:

They use social networking sites to learn from one another and to express their beliefs- even children who are quiet in the classroom, they find it easier to express themselves online (Andy).

The view of social media bringing CYP closer and therefore, allowing them to be more expressive and prosocial, was also shared by other teachers:

They are becoming more compassionate and offer their help to friends who show signs of distress through their online posts (Mia).

[Caplan and Turner \(2007\)](#) argued that electronic communication environments can actually facilitate empathy, as they provide access to people in distressing situations. This 'virtual empathy' Mia refers to, contributes positively to real-world empathy and improves communication ([Carrier et al., 2015](#)). Furthermore, some teachers in the study recognised the importance of social media in fostering a feeling of group belonging and using them during the lockdown, by forming Facebook pages for their classes:

Although initially they were mocking the practice, by the end of the lockdown they were into it and left so many positive comments on our group's Facebook page (Mary).

Using technology to incorporate practices like the above in CYP's daily schedule has the potential to impact them in a positive way; mindfulness allows the development of self-transformation ([Sliwinski et al., 2017](#)) and their self-esteem.

The development of CYP's self-esteem was also discussed with the participants in relation to social media usage. The teachers commented that adolescents in particular 'explore their self through the way they present themselves online, which relates to identity development and engagement with peers (Uhls et al., 2017) and exploration of the ideal self (Przybylski, et al., 2012). Hillier and Harrison (2007) suggested that adolescents who communicated more online had greater clarity of self-concept, which is the ability to understand who they are in a clear and stable way. Using technology to complete school-related projects was also mentioned as a factor contributing positively to CYP's self-esteem:

A boy did filming footage and then he presented it back in the classroom as well; you sort of have the pride, the reward of showcasing it in front of the class, which boosted his self-esteem (Diana).

Other participants also discussed how usage of technology in education can act as a confidence booster, especially for weaker students. According to them, it can give students new tools which can assist in personalising learning to their interests and needs. Research has demonstrated the importance of self-esteem and feelings of pride in academic achievement (e.g., Osborne, 1997) which can also predict performance in particular subjects (Frenzel et al., 2007). Therefore, using technology to engage in problem-solving may produce positive emotions in CYP (such as joy and pride) as it encourages exploration and enhances academic interest (Fredrickson, 2001).

On the other hand, some participants referred to how technology and social media in particular, can have detrimental effects on CYP's wellbeing:

Teens are becoming more and more narcissistic, constantly posting selfies, comparing themselves to all these influencers. It is getting harder for them to accept who they are in reality (Jenny).

Research has associated social comparison and seeking for feedback in CYP's engagement with social media with depressive symptoms (Nesi and Prinstein, 2015) and declines in life satisfaction, even when they use social media in a passive way (Kross et al., 2013). An exploration into the associations between the frequency of social media use and later mental health and wellbeing in adolescents (13–16-year-olds) in England, indicated that usage of social media exceeding three times a day, predicted poor mental health in adolescent girls, who are experiencing loss of sleep, reduced physical activity and exposure to cyberbullying (Viner et al., 2019).

Jenny's reflections reveal that there is an understanding of the influence of social media on adolescents' self-esteem and identity. The teachers who work with adolescents acknowledged the challenges they go through in this phase of development and stated their attempts to show empathy and understanding. Some of them referred to the inclusion of social media in their practices as a way to empower their students to make well-informed decisions, in terms of the content they are engaging with, and help them develop a strong sense of who they are, and how they present themselves online. For example, analysing tweets of radical content related to controversial issues was one of the ways a teacher used to promote their students' critical thinking skills from real world examples.

Exposure to inappropriate content and its effects on CYP was another topic discussed. Violent video gaming was frequently cited by teachers as a factor contributing to changes in CYP's behaviour:

Some of the children have used sexualised language and behaviours that they have seen their older siblings watching and playing games on PlayStation (Mia).

Mia's observations relate to social learning theory (e.g., Bandura, 1986), which hypothesises that children imitate what they see; in this case, violent video gaming would stimulate aggression in CYP. Although many studies contradicted Bandura (e.g., Feshbach & Singer, 1971; Sherry, 2001), a wealth of studies support that exposure to violent video games significantly predicts aggression, especially among

adolescents (e.g., Anderson et al., 2010; Greitemeyer & Mugge, 2014). Possible consequences of video gaming also include anxiety, stress and use of maladaptive coping strategies (Milani et al., 2018), along with decreased academic achievement (Gentile, 2009). Elements of the above are included in Mia's accounts on how video gaming affects children's behaviour:

A lot of children spend a lot of time gaming every night, and quite a lot of parents don't put a stop on that – so they come to school tired and exhausted the next day and that impacts their behaviour (Mia).

When asked in what ways CYP' behaviour is affected, Mia mentioned:

They cannot concentrate as much there are more easily drawn into argument, they are quicker to react, and generally their whole wellbeing is not as good. Sometimes if those games are violent, they copy those behaviours as well (Mia).

Parental responsibility in monitoring CYP's use of digital technology and engagement with inappropriate content, like violent video games, was brought up by many participants:

The parents have ongoing battles trying to pull their children away from screens and the next day they are exhausted, and they find it difficult to get them into school because the children are so tired (Jenny).

Another example included Tricia, who mentioned a conversation she had with a mother, who refused to decrease her child's screen time at home, as the child gets aggressive. Generally, teachers raised some concerns about the role of parents, who according to Mia are 'unfortunately using technology as a babysitter.' However, research has demonstrated that parental monitoring of video gaming is associated with a decrease in exposure to violent materials and a reduction of aggressive behaviour in CYP (Gentile et al., 2014), whereas inconsistent restrictive parental intervention has been shown to lead to enhanced media violence exposure and an increase of aggressive behaviour (Fikkers et al., 2017).

Considering these findings and teachers' concerns over parental responsibility, there is a need for teachers to work in partnership with parents to strike a balance between allowing CYP to explore digital technology on one hand and setting limitations on the other. Given the important role CYP's parents/legal guardians and their out of school lives play in their wellbeing and school achievement, home-school relationships need to be strengthened and operate within a framework set as a whole-school strategy. Therefore, a whole-school approach, which encourages home-school relationships, allows for a broader view of the CYP's digital activities at home and school and is probable to produce positive outcomes for CYP's learning and wellbeing.

The second subtheme of this category encompasses teachers' contradicting perceptions on the role of technology on *socialization processes*. Some teachers believed that engagement with digital activities and technology contributes to social isolation and withdrawal, whereas others talked about the beneficial effects technology has, particularly on shy, socially anxious and withdrawn CYP.

The link between technology and the effects on socialization in CYP is not straightforward, as there are many factors that need to be considered. On one hand, time spent socialising online, displaces real-life social interactions, whereas on the other hand, it may enhance the quality of existing friendships with peers. Some participants raised concerns over the increased use of technology by CYP, as they believe it can negatively impact the development of their social skills:

It's quite normal now for young people to go online and play online games rather than go around to each other's houses and play a game of monopoly. So yeah, it's going to impact those core social skills that we had: initiating conversation in real life, turn-taking in turns of conversation, listening skills (Mia).

This opinion was shared among many participants who also stressed the importance of face-to-face interactions in developing social and communication skills, particularly in understanding non-verbal interactions and body language or tone of voice. The teachers also discussed how playtime has been reduced and how play, as an activity, has changed:

They don't know how to play and actually you will see groups of them surrounding a phone. You'll see them do funny things and film them to share, but then I feel that is – they don't know any different, you only know what you are being shown or you are being taught (Tricia).

In an attempt to increase face-to-face social interactions, some teachers embed interactive activities in their lesson plans, which require teamwork; examples include, among other, the use of traditional sources -and not technology- to find information. Encouraging their students to participate in team sports was another tactic employed by teachers, as not only students get to play, but they also learn how to cooperate with others and resolve any conflicts that may arise. According to participants, this results into improved management of CYP's own and others' emotions and helps withdrawn children.

Social withdrawal in CYP and the way is affected by technology was one of the most prevalent topics in conversations with the teachers who were interviewed. Social withdrawal in CYP may occur for various reasons, including preference for solitude; however, socially withdrawn CYP often face difficulties with peers and school adjustment, and are at risk for many socioemotional difficulties (Rubin et al., 2009). Some teachers believed that engagement in digital activities may exacerbate feelings of loneliness in CYP and lead to isolation:

The truth is, it (*technology*) doesn't help shy kids... those who are lonely and shy, who don't have many friends, won't initiate any interactions, they will end up being more withdrawn when comparing their lives with the lives of more popular peers when they see their profiles online (Andy).

These concerns are echoed by research suggesting there is a correlation between social media use and depressive symptoms (McCrae et al., 2017) and a connection between problematic Facebook use and psychological distress in CYP (Marino et al., 2018). Also, excessive time spent on social media is associated with low self-esteem and socioemotional difficulties (e.g., Beardmore, 2015), characteristics of withdrawn CYP. As discussed, this might be because social media encourage upward (negative) social comparisons with others, given the materials people select to share online (Zuo, 2014).

The teachers reported an awareness of the consequences of social withdrawal on CYP and of their own responsibilities in dealing with them. Coaching CYP in developing social skills, being empathetic and encouraging them to participate in offline social activities were among the strategies teachers listed when asked about their responses to socially withdrawn CYP. Strengthening the quality of relationships they have with students and working along with parents were also among their responses:

As an educator you need to have a strong bond with the child to identify symptoms of such behaviours, but this is not enough... parents should be role models and allow their children to develop their social skills in a healthy way (Sarah).

Again, teachers referred to the role of parents and how they should be modelling and supporting the development of healthy behaviours. The teachers' discourses suggest that there is a need for strengthening the home-school relationship, highlighting the importance of working together with parents to promote positive student outcomes.

There were teachers who had more positive views on the way technology affects CYP's social skills. There was agreement among these teachers that technology should not be proclaimed responsible for diminishing CYP's social skills, providing examples of socially withdrawn students who became more active during the first lockdown in the UK:

I was surprised to see how his behaviour changed in Google classrooms. He is more talkative, takes initiatives, and participates in activities with other children, whereas he was really isolated and inactive during face-to-face teaching (Lea).

The participants discussed how technology has reinforced socialisation processes of withdrawn CYP, focusing on the 'safety' online environments offer, as some may feel more at ease. This connects to research suggesting online communication is more beneficial to introverted adolescents, as they want to compensate for lacking social skills by increasing their opportunities for developing friendships online (Peter et al., 2006). The teachers also referred to online communities that can foster a sense of belonging among their users, allowing withdrawn CYP to experience all the benefits they offer and meet their need to belong to a group. According to teachers in this study, this has contributed to students having an enhanced sense of emotional connection to others:

They are now more relationship-oriented than ever and more considerate. They comment on others' posts and videos, offer support, and this has helped them build and sustain their relationships now that they are not physically meeting (Diana).

It has been acknowledged by research that online communities can enhance friendships and decrease loneliness in CYP (e.g., Wood et al., 2016) having a positive impact on their social capital:

This is how teenagers communicate these days, they make important connections with peers and they don't want to miss out on the latest news, invitations or conversations (Mary).

Research has suggested, one of the benefits of technology use is the enhancement of communication among CYP (Ito et al., 2008), which can have positive impacts on the formation of new friendships and the strengthening of existing ones. According to research, preadolescents and adolescents interact online mainly to remain connected with their existing friends (Valkenburg & Peter, 2007), whereas late adolescents use social media like Facebook to communicate intimate topics with their friends (Jordan-Conde et al., 2014). As digital technology and online communication are in our times ubiquitous for CYP, who use it for socialisation purposes, the topic of online safety was also raised by teachers:

There are predators out there and we do discuss online safety issues with my students, but some stuff should be part of the curriculum as well, and parents should access it too (Mary).

Once again, parental responsibility and the need to work closely with parents were brought up by teachers, implying there is more that can be done at a wider level. More opportunities in the curriculum on issues related to online safety, informing parents and giving them access to sources of support can result in positive outcomes, allowing CYP to use technology responsibly.

6. Conclusions

This study has initialised an investigation into teachers' perceptions of the impact of technology on CYP's emotions and behaviours. Teachers discussed both the positive and negative role that technology can play in CYP's lives, education, and social relationships. Although it is not the aim of the study to make generalisations, teachers' discourses allow for the consideration of specific implications for practice.

6.1. Implications

The results suggested teachers believe technology contributes to both effective teaching and learning, with appropriate application. This includes continuous training on the latest technological developments, but also sessions addressed to improving teachers' attitudes and confidence on the integration of technology in education. The employment of multimodal methods was also discussed, as children are exposed to a wide

range of different information in today's world; finally, the suitability of certain tech tools was discussed, with teachers praising the use of technology in educating SEN learners, whilst at the same time acknowledging that students' individual characteristics need to be taken into account when using certain tools.

The opinion that children from underprivileged backgrounds will see their academic attainment fall was shared among many teachers. The participants referred to the disparity of technological resources available to wealthy schools/students as compared to disadvantaged schools/students as one of the main factors affecting students' academic progress. Teachers thought the 'socioeconomic digital divide', brought to light by the pandemic, as the main factor affecting students' attainment during this period. Discussing how they can bridge this learning gap, teachers reported feelings of helplessness, as they thought they are unable to assist some students with their academic progress. Nonetheless, they made suggestions including among other, governmental funding to schools in deprived areas, establishing blended teaching in such schools and providing laptops for home use along with hard copies of the online resources to students who have no internet connection. These kinds of practices demand for changes in governance and legislation by establishing new, more effective strategies dedicated to bridging the socioeconomic digital divide.

Furthermore, teachers held conflicting opinions on issues related to the impact of technology on how CYP express their emotions, their self-esteem and socialisation processes. They primarily focused on the usage of social media and video games by CYP, with some focusing on their positive aspects (e.g., facilitation of empathy) and some on their negative (exposure to inappropriate content). These opinions were evident in their practices, as some integrated social media in their teaching, whilst others embedded interactive activities in their lessons requiring the use of traditional sources, in an attempt to balance online and offline learning opportunities. According to the participants, students responded positively to the integration of social media in their learning and the usage of online mindfulness techniques, suggesting that continuous professional development for teachers should focus on the cautious usage of such tools in teaching practices; this would allow teachers to capitalize on the benefits they offer, aware of potential downsides, like for example increased sense of belonging and wellbeing. Educational practices should be up to date with all the changes and new methods offered by digital technology, so that any intervention programmes addressed to CYP are appropriate and efficient in engaging them. Clearer guidance is needed to help teachers with practices such as how to encourage creativity with technology in the classroom (Henriksen et al., 2021)

Finding the right balance between the digital and the non-digital prevailed among the conversations we had with teachers and was evident in all the themes emerging from data. The role of parents in monitoring CYP's engagement with technology was deemed crucial in striking a balance between allowing CYP to explore technology on one hand and setting limitations on the other. Teachers' discourses demonstrated a concern over how parents deal with CYP's excessive use of digital activities, suggesting that home-school relationships need to be strengthened and embedded in whole-school approaches. Teachers can work with parents to materialize ideas and produce plans for CYP, based on their needs and areas that require improvement; parents can be given access to information sources used by teachers and complement them based on their own experiences, allowing for a broader view of the CYP's digital activities at home and school. As both school and parents play a major role in CYP's wellbeing, it is important to focus on the positive aspects of engagement with digital activities, whilst empowering CYP with tools to cope with any challenges they might arise in online environments and creating/supporting the development of digital resilience.

Moreover, teachers' conflicting views on how usage of digital technology affects CYP's expression of emotions, self-esteem, and socialisation processes, demonstrate that there is a need for certain interventions for teachers, parents, and students. For example, a range of strategies

can be practically implemented, addressing issues related to using technology as a tool to improve CYP's self-esteem, managing cyberbullying and using their critical thinking skills in judging online content. Opportunities for discussions on online safety should be included in the curriculum, so that students are given the opportunity to critically evaluate the online content they are exposed to. This would allow CYP to use technology in a responsible, resilient, and creative way for educational, socialisation and entertaining purposes.

6.2. Limitations

The major limitation of this study is related to the time it was conducted. Although the Covid-19 pandemic allowed participants to reflect deeper on their practices and opinions, it has also guided and structured their responses during interviews. This made it difficult for us to clearly understand whether the pandemic has altered previous opinions held by teachers. However, using specific questions related to their past practices, allowed us to make the distinction between past and current experiences of the participants. Although this retrospective recall of their experiences might be problematic, a follow-up, post-Covid study will reveal whether there are any changes in the perceptions held by teachers and consequently, on their practices.

6.3. Recommendations

Studies on teachers' perceptions are useful as they provide insights into how technology can be used to shape experiences for students; they also reveal training needs for educators and the need for the implementation or modification of relevant practices (e.g., technology training within teacher training) and policies (e.g., addressing the digital divide). However, in order to have a broader view of how digital technology affects CYP's emotions and behaviours, other background variables and factors not included in this study need to be considered. For example, research on bridging the socioeconomic digital divide needs to consider the perceptions of teachers working in deprived areas so that the implementation of current policies and practices is reassessed. Furthermore, qualitative studies exploring parents and CYP's opinions may complement teachers' perceptions and lead to the establishment of educational practices based on the stakeholders' own voices and experiences. Similarly, future studies can investigate SEN teachers' perceptions or focus on educators working in different contexts and settings. Additionally, research on the evaluation of school-based interventions aimed at enhancing CYP's digital wellbeing is essential, as there is currently a gap in this field.

Teaching CYP how to balance the digital with the non-digital is essential for their wellbeing and development of a range of abilities, including socialisation and interpersonal skills. Teachers' role in preparing CYP for a world where technological advancements bring all sort of changes is now more crucial than ever. On one hand, teachers should help students explore and engage with digital activities that may support deep learning, but on the other hand, they have a duty to protect their students' wellbeing. Teachers can empower CYP to take control of their own emotions and behaviours, by helping them recognise that it is the unhealthy use of technology that has a negative impact on their self-esteem, reactions and moods – not technology per se. However, enhancing CYP's digital wellbeing, especially in the post-Covid era, will require schools, parents, and governmental agencies to form collaborative relationships in order to provide CYP the necessary, protective tools to navigate technology and the online world.

Declaration of Competing Interest

None.

Funding

N/A

Availability of data and material

To ensure data transparency anonymised data will be added to BU's online Research [Data Repository](#): this is a central location where data is stored, which is accessible to the public.

Ethics approval

Our Ethics application (ID:32030) was reviewed and approved in line with BU's [Research Ethics Code of Practice](#) on 8th April 2020.

References

- Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., Rothstein, H. R., & Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in eastern and western countries: a meta-analytic review. *Psychological Bulletin*, 136(2), 151–173. [10.1037/a0018251](https://doi.org/10.1037/a0018251).
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall.
- Beardmore, R. (2015). Measuring national well-being: Insights into children's mental health and well-being. *Office for National Statistics*. <https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/articles/measuringnationalwellbeing/2015-10-20>.
- Beltran, D. O., Das, K. K., & Fairlie, R. W. (2008). Are computers good for children? *The effects of home computers on educational outcomes*. The Australian National University. Centre for Economic Policy Research <https://trove.nla.gov.au/work/153057901>.
- Bhargava, A., Kirova-Petrova, A., & McNair, S. (1999). Computers, gender bias, and young children. *Information Technology in Childhood Education Annual*, 1999(1), 263–274. Association for the Advancement of Computing in Education (AACE). <https://www.learnstechlib.org/primary/p/8855/>.
- Bowman, M. A., Vongkulluksn, V. W., Jiang, Z., & Xie, K. (2020). Teachers' exposure to professional development and the quality of their instructional technology use: The mediating role of teachers' value and ability beliefs. *Journal of Research on Technology in Education*. [10.1080/15391523.2020.1830895](https://doi.org/10.1080/15391523.2020.1830895).
- Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. Sage.
- Brinkerhof, J. (2006). Effects of a long-duration, professional development academy on technological skills, computer self-efficacy, and technology integration beliefs and practices. *Journal of Research on Technology in Education*, 39(1), 22–44.
- British Psychological Society (2018). British Psychological Society's Code of Ethics and Conduct. Retrieved from <https://www.bps.org.uk/news-and-policy/bps-code-ethics-and-conduct>
- Byrne, J., Kardefelt Winther, D., Livingstone, S., & Stoilova, M. (2016). Global kids online research synthesis, 2015–2016. UNICEF Office of Research. www.unicef-irc.org/publications/869-global-kids-online-research-synthesis-2015-2016.html.
- Caplan, S. E., & Turner, J. S. (2007). Bringing theory to research on computer-mediated comforting communication. *Computers in Human Behavior*, 23(2), 985–998. [10.1016/j.chb.2005.08.003](https://doi.org/10.1016/j.chb.2005.08.003).
- Carrier, M. L., Spradlin, A., Bunce, J. P., & Rosen, L. D. (2015). Virtual empathy: Positive and negative impacts of going online upon empathy in young adults. *Computers in Human Behavior*, 52, 39–48. [10.1016/j.chb.2015.05.026](https://doi.org/10.1016/j.chb.2015.05.026).
- Clark, D. B., Tanner-Smith, E. E., & Killingsworth, S. S. (2016). Digital games, design, and learning: A systematic review and meta-analysis. *Review of Educational Research*, 86(1), 79–122. [10.3102/0034654315582065](https://doi.org/10.3102/0034654315582065).
- Cole, M., Brynn Hibbert, D., & Kehoe, E. (2013). Students' perceptions of using Twitter to interact with the instructor during lectures for a large-enrolment chemistry course. *Journal of Chemical Education*, 90, 671–672.
- Cox, D., & McLeod, S. (2014). Social media strategies for school principals. *NASSP Bulletin*, 98, 5–25. [10.1177/0192636513510596](https://doi.org/10.1177/0192636513510596).
- Cresswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research*. Sage.
- Cullinane, C., & Montacute, R. (2020). COVID-19 and social mobility impact brief #1: School shutdown. *Sutton Trust*.
- Department for Education (DfE) (2019). *Relationships education, relationships and sex education (RSE) and health education*. <https://www.gov.uk/government/publications/relationships-education-relationships-and-sex-education-rse-and-health-education>
- Department for Education (DfE) (2020). *Actions for schools during the coronavirus outbreak*. <https://www.gov.uk/government/publications/actions-for-schools-during-the-coronavirus-outbreak>
- Donmuş, A. G. V., & Gürol, M. (2014). The effect of educational computer games on student motivation in learning English. *e-International Journal of Educational Research*, 5, 10.19160/e-ijer.53979.
- Donohue, C. (2015). Technology and digital media as tools for teaching and learning in the digital age. In C. Donohue (Ed.), *Technology and digital media in the early years: Tools for teaching and learning* (pp. 21–35). Routledge.
- Evans, G. W. (2004). The environment of childhood poverty. *American Psychologist*, 59, 77–92. [10.1037/0003-066X.59.2.77](https://doi.org/10.1037/0003-066X.59.2.77).
- Feshbach, S., & Singer, R. D. (1971). Television and aggression. *Jossey Bass*.
- Fikkers, K. M., Piotrowski, J. T., & Valkenburg, P. M. (2017). A matter of style? Exploring the effects of parental mediation styles on early adolescents' media violence exposure and aggression. *Computers in Human Behavior*, 70, 407–415. [10.1016/j.chb.2017.01.029](https://doi.org/10.1016/j.chb.2017.01.029).
- Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The broaden-and-build theory of positive emotions. *American Psychologist*, 56, 218–226. <https://dx.doi.org/10.1037/0003-066X.56.3.218>.
- Frenzel, A. C., Pekrun, R., & Goetz, T. (2007). Perceived learning environment and students' emotional experiences: A multilevel analysis of mathematics classrooms. *Learning and Instruction*, 17(5), 478–493. [10.1016/j.learninstruc.2007.09.001](https://doi.org/10.1016/j.learninstruc.2007.09.001).
- Gabbiadini, A., & Greitemeyer, T. (2017). Uncovering the association between strategy video games and self-regulation: A correlational study. *Personality and Individual Differences*, 104, 129–136. [10.1016/j.paid.2016.07.041](https://doi.org/10.1016/j.paid.2016.07.041).
- Gentile, D. (2009). Pathological video-game use among youth ages 8 to 18: A national study. *Psychological Science*, 20(5), 594–602. [10.1111/j.1467-9280.2009.02340.x](https://doi.org/10.1111/j.1467-9280.2009.02340.x).
- Gentile, D. A., Li, D., Khoo, A., Prot, S., & Anderson, C. A. (2014). Mediators and moderators of long-term effects of violent video games on aggressive behavior: Practice, thinking, and action. *JAMA Pediatrics*, 168(5), 450–457. [10.1001/jamapediatrics.2014.63](https://doi.org/10.1001/jamapediatrics.2014.63).
- George, M. J., & Odgers, C. L. (2015). Seven fears and the science of how mobile technologies may be influencing adolescents in the digital age. *Perspectives on Psychological Science: A Journal of the Association for Psychological Science*, 10(6), 832–851. [10.1177/1745691615596788](https://doi.org/10.1177/1745691615596788).
- Gottschalk, F. (2019). *Impacts of technology use on children: Exploring literature on the brain, cognition and well-being*. OECD Publishing <https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/WKP%282019%293&docLanguage=En>.
- Granic, I., Lobel, A., & Engels, R. C. (2014). The benefits of playing video games. *American Psychologist*, 69(1), 66. [10.1037/a0034857](https://doi.org/10.1037/a0034857).
- Greitemeyer, T., & Mügge, D. O. (2014). Video games do affect social outcomes: a meta-analytic review of the effects of violent and prosocial video game play. *Personality & Social Psychology Bulletin*, 40(5), 578–589. [10.1177/0146167213520459](https://doi.org/10.1177/0146167213520459).
- Henriksen, D., Creely, E., Henderson, M., & Mishra, P. (2021). Creativity and technology in teaching and learning: a literature review of the uneasy space of implementation. *Educational Technology Research and Development*, 1–18.
- Hillier, L., & Harrison, L. (2007). Building realities less limited than their own: Young people practising same-sex attraction on the internet. *Sexualities*, 10(1), 82–100. [10.1177/1363460707072956](https://doi.org/10.1177/1363460707072956).
- Hoge, E., Bickham, D., & Cantor, J. (2017). Digital media, anxiety, and depression in children. *Pediatrics*, 140(Suppl 2), S76–S80. [10.1542/peds.2016-1758G](https://doi.org/10.1542/peds.2016-1758G).
- Hong, K., & Koh, C. (2002). Computer anxiety and attitudes toward computers among rural secondary school teachers: A Malaysian perspective. *Journal of Research on Technology in Education*, 35(1), 27–46. [10.1080/153915232002.10782368](https://doi.org/10.1080/153915232002.10782368).
- Ito, M., Horst, H., Bittanti, M., Boyd, D., Herr-Stephenson, B., Lange, P. G., Pascoe, C. J., Robinson, L., Baumer, S., Cody, R., Mahendran, D., Martínez, K., Perkel, D., Christo Sims, C., & Tripp, T. (2008). *Living and learning with new media: Summary of findings from the digital youth project*. MIT Press.
- Jackson, L. A., Witt, E. A., Games, A. I., Fitzgerald, H. E., Von Eye, A., & Zhao, Y. (2012). Information technology use and creativity: Findings from the Children and Technology Project. *Computers in Human Behavior*, 28(2), 370–376. [10.1016/j.chb.2011.10.006](https://doi.org/10.1016/j.chb.2011.10.006).
- Jeffrey, Lynn, Milne, John, Suddaby, Gordon, & Higgins, Andrew (2014). Blended Learning: How Teachers Balance the Blend of Online and Classroom Components. *Journal of Information Technology Education: Research*, 13, 121–140. [10.28945/1968](https://doi.org/10.28945/1968).
- Jelenchick, L. A., Eichhoff, J. C., & Moreno, M. A. (2013). "Facebook depression?" social networking site use and depression in older adolescents. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 52(1), 128–130. [10.1016/j.jadohealth.2012.05.008](https://doi.org/10.1016/j.jadohealth.2012.05.008).
- Jordan-Conde, Z., Mennecke, B., & Townsend, A. (2014). Late adolescent identity definition and intimate disclosure on Facebook. *Computers in Human Behavior*, 33, 356–366. [10.1016/j.chb.2013.07.015](https://doi.org/10.1016/j.chb.2013.07.015).
- Kardefelt-Winther, D. (2017). How does the time children spend using digital technology impact their mental well-being, social relationships and physical activity? *An evidence focused literature review*. UNICEF Office of Research www.unicef-irc.org/publications/pdf/Children-digital-technology-wellbeing.pdf.
- Ke, F. (2009). A qualitative meta-analysis of computer games as learning tools. *R. E. Ferdig(Eds)*, Handbook of research on effective electronic gaming in education (1-32). Information Science Reference.
- Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., Shablack, H., Jonides, J., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PLoS One*, 8(8), e69841. [10.1371/journal.pone.0069841](https://doi.org/10.1371/journal.pone.0069841).
- Låftman, S. B., Modin, B., & Östberg, V. (2013). Cyberbullying and subjective health: A large-scale study of students in Stockholm, Sweden. *Children and Youth Services Review*, 35(1), 112–119. [10.1016/j.childyouth.2012.10.020](https://doi.org/10.1016/j.childyouth.2012.10.020).
- Lowood, H. (2008). *Found technology: Players as innovators in the making of machinima*. MIT Press.
- Manasijević, D., Živković, D., Arsić, S., & Milošević, I. (2016). Exploring students' purposes of usage and educational usage of Facebook. *Computers in Human Behavior*, 60, 441–450. [10.1016/j.chb.2016.02.087](https://doi.org/10.1016/j.chb.2016.02.087).
- Marino, C., Gini, G., Vieno, A., & Spada, M. M. (2018). The associations between problematic Facebook use, psychological distress and well-being among adolescents and young adults: A systematic review and meta-analysis. *Journal of Affective Disorders*, 226, 274–281. [10.1016/j.jad.2017.10.007](https://doi.org/10.1016/j.jad.2017.10.007).
- McCrae, N., Gettings, S., & Pursell, E. (2017). Social media and depressive symptoms in childhood and adolescence: A systematic review. *Adolescent Research Review*, 2, 315–330. [10.1007/s40894-017-0053-4](https://doi.org/10.1007/s40894-017-0053-4).
- McDougall, P., & Vaillancourt, T. (2015). Long-term adult outcomes of peer victimization in childhood and adolescence: Pathways to adjustment and maladjustment. *American Psychologist*, 70(4), 300–310. [10.1037/a0039174](https://doi.org/10.1037/a0039174).
- Milani, L., La Torre, G., Fiore, M., Grumi, S., Gentile, D. A., Ferrante, M., Miccoli, S., & Di Blasio, P. (2018). Internet gaming addiction in adolescence: Risk factors and malad-

- justment correlates. *International Journal of Mental Health and Addiction*, 16, 888–904. [10.1007/s11469-017-9750-2](https://doi.org/10.1007/s11469-017-9750-2).
- Mitchell, P. H. (2014). Global education for collaborative practice. *International Nursing Review*, 61, 157–158. [10.1111/inr.12108](https://doi.org/10.1111/inr.12108).
- Moisala, M., Salmela, V., Hietajärvi, L., Carlson, S., Vuontela, V., Lonka, K., Hakkarainen, K., Salmela-Aro, K., & Alho, K. (2017). Gaming is related to enhanced working memory performance and task-related cortical activity. *Brain Research*, 1655, 204–215. [10.1016/j.brainres.2016.10.027](https://doi.org/10.1016/j.brainres.2016.10.027).
- Montacute, R., & Cullinane, C. (2018). Parent power 2018: How parents use financial and cultural resources to boost their children's chances of success. *The Sutton Trust*. <https://www.suttontrust.com/our-research/parent-power-2018-schools/>.
- Nesi, J., & Prinstein, M. J. (2015). Using social media for social comparison and feedback-seeking: Gender and popularity moderate associations with depressive symptoms. *Journal of Abnormal Child Psychology*, 43(8), 1427–1438. [10.1007/s10802-015-0020-0](https://doi.org/10.1007/s10802-015-0020-0).
- NHS Digital. (2018). *Mental health of children and young people in England, 2017. Summary of Key Findings*. <https://files.digital.nhs.uk/A6/EA7D58/MHCYP%202017%20Summary.pdf>.
- OECD. (2019). *PISA 2018: Insights and Interpretations*. Paris: OECD Publishing <https://www.oecd.org/pisa/PISA%202018%20Insights%20and%20Interpretations%20FINAL%20PDF.pdf>.
- Ofcom (2020). *Children and parents: Media use and attitudes report 2019*. https://www.ofcom.org.uk/_data/assets/pdf_file/0023/190616/children-media-use-attitudes-2019-report.pdf
- Osborne, J. W. (1997). Race and academic disidentification. *Journal of Educational Psychology*, 89, 728–735.
- Parkes, A., Sweeting, H., Wight, D., & Henderson, M. (2013). Do television and electronic games predict children's psychosocial adjustment? Longitudinal research using the UK Millennium Cohort Study. *Archives of Disease in Childhood*, 98, 341–348. <http://dx.doi.org/10.1136/archdischild-2011-301508>.
- Peter, J., Valkenburg, P. M., & Schouten, A. P. (2006). Characteristics and motives of adolescents talking with strangers on the internet. *Cyberpsychology & Behavior: The Impact of the Internet, Multimedia and Virtual Reality on Behavior and Society*, 9(5), 526–530.
- Piotrowski, C. (2015). Academic applications of social media: A review of peer-review research in higher education. *Psychology and Education: An Interdisciplinary Journal*, 52(3–4), 15–22.
- Plowman, L., & McPake, J. (2013). Seven myths about young children and technology. *Childhood Education*, 89(1), 27–33. <http://dx.doi.org/10.1080/00094056.2013.757490>.
- Primack, B. A., Shensa, A., Sidani, J. E., Whaite, E. O., Lin, L. Y., Rosen, D., Colditz, J. B., Radovic, A., & Miller, E. (2017). Social media use and perceived social isolation among young adults in the U.S. *American Journal of Preventative Medicine*, 53(1), 1–8. [10.1016/j.amepre.2017.01.010](https://doi.org/10.1016/j.amepre.2017.01.010).
- Przybylski, A. K., Weinstein, N., Murayama, K., Lynch, M. F., & Ryan, R. M. (2012). The ideal self at play: The appeal of video games that let you be all you can be. *Psychological Science*, 23(1), 69–76. [10.1177/0956797611418676](https://doi.org/10.1177/0956797611418676).
- Przybylski, A. K., & Weinstein, N. (2017). A large-scale test of the goldilocks hypothesis. *Psychological Science*, 28(2), 204–215. [10.1177/0956797616678438](https://doi.org/10.1177/0956797616678438).
- Royer, R. (2002). Supporting technology integration through action research. *Clearing House*, 75, 233.
- Rubin, K. H., Coplan, R. J., & Bowker, J. C. (2009). Social withdrawal in childhood. *Annual Review of Psychology*, 60, 141–171. [10.1146/annurev.psych.60.110707.163642](https://doi.org/10.1146/annurev.psych.60.110707.163642).
- Sherry, J. L. (2001). The effects of violent video games on aggression. A meta-analysis. *Human Communication Research*, 27, 409–431. [10.1111/j.1468-2958.2001.tb00787.x](https://doi.org/10.1111/j.1468-2958.2001.tb00787.x).
- Slivinski, J., Katsikitis, M., & Jones, C. M. (2017). A review of interactive technologies as support tools for the cultivation of mindfulness. *Mindfulness*, 8, 1150–1159. [10.1007/s12671-017-0698-x](https://doi.org/10.1007/s12671-017-0698-x).
- Steers, M-L. N., Wickham, R. E., & Acitelli, L. K. (2014). Seeing everyone else's highlight reels: How facebook usage is linked to depressive symptoms. *Journal of Social and Clinical Psychology*, 33(8), 701–731. [10.1521/jscp.2014.33.8.701](https://doi.org/10.1521/jscp.2014.33.8.701).
- Stewart, H., Watson, N., & Campbell, M. (2018). The cost of school holidays for children from low income families. *Childhood*, 25(4), 516–529. [10.1177/0907568218779130](https://doi.org/10.1177/0907568218779130).
- Swing, E. L., Gentile, D. A., Anderson, C. A., & Walsh, D. A. (2010). Television and video game exposure and the development of attention problems. *Pediatrics*, 126(2), 214–221. [10.1542/peds.2009-1508](https://doi.org/10.1542/peds.2009-1508).
- Tess, P. (2013). The role of social media in higher education classes (real and virtual): A literature review. *Computers in Human Behavior*, 29(5), 60–68. [10.1016/j.chb.2012.12.032](https://doi.org/10.1016/j.chb.2012.12.032).
- Uhls, Y. T., Ellison, N. B., & Subrahmanyam, K. (2017). Benefits and costs of social media in adolescence. *Pediatrics*, 140(Suppl 2), S67–S70. [10.1542/peds.2016-1758E](https://doi.org/10.1542/peds.2016-1758E).
- Valkenburg, P. M., & Peter, J. (2007). Preadolescents' and adolescents' online communication and their closeness to friends. *Developmental Psychology*, 43(2), 267–277. [10.1037/0012-1649.43.2.267](https://doi.org/10.1037/0012-1649.43.2.267).
- Van Acker, F., Van Buuren, H., Kreijns, K., & Vermeulen, M. (2011). Why teachers use digital learning materials. *Educational Information Technology*, 18, 495–514.
- Verduyn, P., Lee, D. S., Park, J., Shablack, H., Orvell, A., Bayer, J., Ybarra, O., Jonides, J., & Kross, E. (2015). Passive Facebook usage undermines affective well-being: Experimental and longitudinal evidence. *Journal of Experimental Psychology: General*, 144(2), 480–488. [10.1037/xge0000057](https://doi.org/10.1037/xge0000057).
- Viner, R. M., Gireesh, A., Stiglic, N., Hudson, L. D., Goddings, A. L., Ward, J. L., & Nicholls, D. E. (2019). Roles of cyberbullying, sleep, and physical activity in mediating the effects of social media use on mental health and wellbeing among young people in England: A secondary analysis of longitudinal data. *The Lancet Child & Adolescent Health*, 3(10), 685–696. [10.1016/S2352-4642\(19\)30186-5](https://doi.org/10.1016/S2352-4642(19)30186-5).
- Vogt, W. P. (1999). *Dictionary of statistics and methodology: A nontechnical guide for the social sciences*. Sage.
- Walsh, M. (2010). *Multimodal literacy: What does It mean for classroom practice? Australian Journal of Language and Literacy*, 33, 211–239.
- Williams, K. D. (2013). The effects of video game controls on hostility, identification, and presence. *Mass Communication & Society*, 16, 26–48. [10.1080/15205436.2012.661113](https://doi.org/10.1080/15205436.2012.661113).
- Wood, M. A., Bukowski, W. M., & Lis, E. (2016). The digital self: How social media serves as a setting that shapes youth's emotional experiences. *Adolescent Research Review*, 1, 163–173. [10.1007/s40894-015-0014-8](https://doi.org/10.1007/s40894-015-0014-8).
- Wouters, P., Van Nimwegen, C., Van Oostendorp, H., & Van Der Spek, E. D. (2013). A meta-analysis of the cognitive and motivational effects of serious games. *Journal of Educational Psychology*, 105(2), 249–265. [10.1037/a0031311](https://doi.org/10.1037/a0031311).
- Ziv, I., & Kiasi, M. (2016). Facebook's contribution to well-being among adolescent and young adults as a function of mental resilience. *The Journal of Psychology: Interdisciplinary and Applied*, 150(4), 527–541. [10.1080/00223980.2015.1110556](https://doi.org/10.1080/00223980.2015.1110556).
- Zuo, A. (2014). Measuring up: Social comparisons on facebook and contributions to self-esteem and mental health. [MSc thesis, University of Michigan].