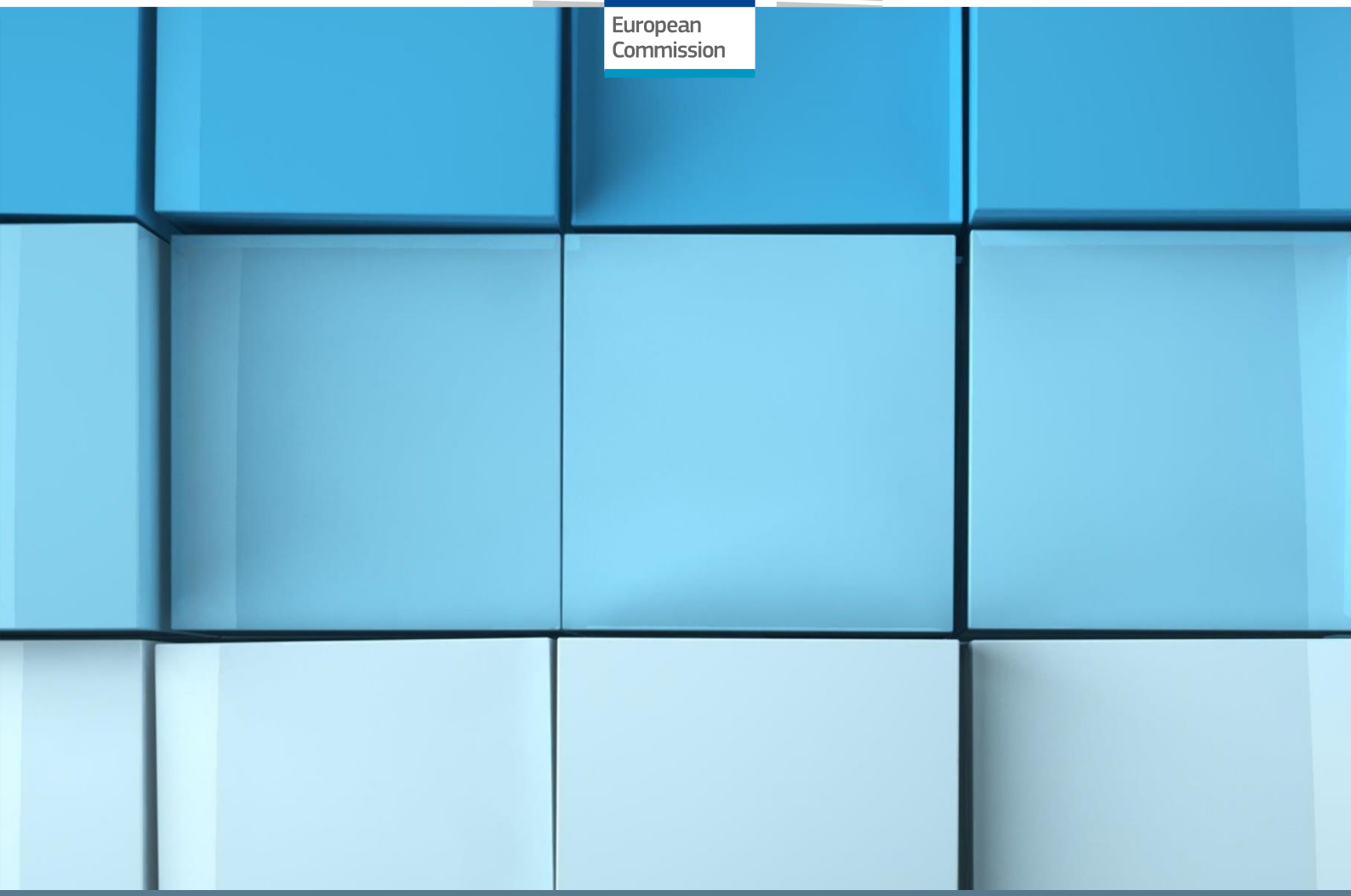

Effects of the use of digital technology on children's empathy and attention capacity

Executive Summary

NESET

Education and Training

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ABOUT NESET

NESET is an advisory network of experts working on the social dimension of education and training.

The European Commission's Directorate-General for Education and Culture initiated the establishment of the network as the successor to NESSE (2007-2010), NESET (2011-2014) and NESET II (2015-2018).

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Executive summary

Students, teachers, families and other community members use digital technology as an educational tool in formal, non-formal and informal learning environments. While its use is widespread, increasing concern has emerged about its effects on children, particularly in relation to their empathy and attention capacity, as these dimensions are crucial to students' development and success. The effects of using digital technology are embedded in the context in which it is employed. These effects can be different, depending on how technology is used, and to what purpose.

This analytical report reveals the most relevant and up-to-date scientific contributions worldwide about the effects of the use of digital technology on children's empathy and attention capacity. The report synthesises existing knowledge gathered from an extensive literature review that has identified evidence from scientific articles and relevant European Commission (EC) official reports on the topic of focus. The guiding question of the present report is:

- What are the effects of the use of digital technology on children's empathy and attention?

The concepts of digital technology, children's empathy and attention capacity are at the core of this report. The key findings of our in-depth literature review are divided into two main sections: 1) the effects of the use of digital technology on children's empathy; and 2) effects of digital technology use on children's attention capacity. Based on this analysis, the report provides useful recommendations for the diverse agents involved in children's education, from policy makers and stakeholders to teachers and families.

Key findings

1. The effects of the use of digital technology on children's empathy

The report's key findings on the effects of the use of digital technology include evidence about the ways in which it has an impact on children's empathy, and the factors most relevant in explaining such effects. Empathy increases in some children or decreases in others, depending on **the way in which digital technology is used,** and **to what purpose**. The key findings of our literature review are as follows:

- **Digital technology has the effect of increasing children's empathy when its content, use and interactions are prosocial.** Prosocial uses of digital technology can be promoted in very diverse learning activities and environments. Students' interactions and interactive learning approaches play a key role in these effects. This finding is in line with the principles of dialogic education, which is based on the capacity for dialogue to be used as a tool to collectively create meaning. This promotes the inclusion of all voices and fosters the creation of dialogic environments in which participants (teachers, families, volunteers, students) organise themselves and make decisions on a consensual basis. Thus, dialogic learning environments can contribute to an increase in children's empathy through the use of digital technology. In addition, it is important to take into account the need for this prosocial perspective to be present in all spaces within a school. Indeed, the literature highlights the importance of delivering consistent

practice across all spaces, in order to avoid the negative effects of 'not practising what you preach' (double standards).

- **Digital technology has the effect of decreasing children's empathy when it involves antisocial use and violent content.** Choosing violent media content (movies and series), playing violent video games or engaging in bullying and discriminatory actions can exacerbate aggressive attitudes, emotions and behaviours. It can also desensitise participants and decreasing their empathy and prosocial behaviour. Some authors suggest that such effects are not long-lasting, and that playing prosocial video games can have a neutralising effect. The development of critical thinking skills has been identified as key for children and adolescents to reject/critically scrutinise uses of digital technology that influence them negatively. Learning environments that are rich in interactions, such as dialogic learning environments, promote children's capacity to critically assess their use of technology, while fostering solidarity and empathy.
- **Digital technology has the effect of decreasing children's empathy when screen time reduces face-to-face interactions.** Some authors show an association between screen time and reduced capacity to make friends or increased difficulty in learning empathy in real-life contexts. However, online interactions and time spent using digital technology can increase empathy as long as they do not reduce face-to-face interactions. Furthermore, interactively rich environments that foster the collaborative use of digital technology can offer a balanced environment in which the use of digital technology is not detrimental to face-to-face interaction.
- **The use of digital technology presents some perils, including cyberbullying.** The association between empathy and the perpetration of cyberbullying has been the subject of much research. This has focused on exploring the possibility of predicting an individual's likelihood of perpetrating cyberbullying, based on their empathy score. However, the way in which children's capacity for empathy may be affected by their use of digital technology to perpetrate cyberbullying remains an underexplored issue. Further research is required.

These key findings enable us to elaborate a number of recommendations on dealing with the effects of digital technology on children's empathy.

Recommendations on digital technology and children's empathy

1. Digital technology can have the effect of increasing children's empathy when its content and use follow a prosocial approach. Such effects can be enhanced by **promoting interactive learning environments and ensuring coherence** throughout all learning activities.
2. Digital technology can have the effect of reducing children's empathy when its content and use involve antisocial approaches and violent content. Such effects can be avoided through the **development of media literacy, including critical thinking skills**.
3. Digital technology can have the effect of reducing children's empathy when screen time occurs to the detriment of face-to-face interactions. Such effects can be avoided through the **promotion of real interactive environments** that enhance integration of the use of digital technology while fostering student collaboration via dialogic learning environments.
4. The use of digital technology presents some **perils, including cyberbullying**. Further research is required to explore this issue.

2. The effects of the use of digital technology on children's attention capacity

Policy makers, teachers, families and other community members have raised relevant concerns about the attention problems in students that may result from the use of digital technology use, and how such effects can influence students' cognitive functions. Research has focused on diverse uses and devices, making remarkable contributions to the understanding of the effects of computerised cognitive training programmes. In addition, it has explored the effects of integrating smart devices into daily educational activities, approaching in a relevant way the impact of the use of digital technology on children's attention capacity. **Children's use of digital technology can, in some case, improve their attention capacity. In other cases, it can be a distraction that generates attention problems.** Research shows that whether it produces one effect or the other is dependent on the way in which digital technology is used, the time spent using digital technology for non-educational purposes, and the learning approach that is applied.

With respect to this, the key findings of the literature review are as follows:

1. **Computerized cognitive training programs produce diverse effects.** Some such programs improve the attention capacity of children, while others do not exhibit a significant effect in this regard. From the scientific evidence, it can be stated that further research is required to identify the key factors that contribute to an improvement in attention capacity by computerised training programs.
2. **The integration of smart devices (i.e. tablets, smartphones) into educational activities improves children's attention capacity.** A common finding on the effect of the use of smart devices in the classroom is that they have the effect *per se* of improving attention capacity. Research indicates that when the use of digital technology is integrated into a school activity, it has the potential

to improve attention capacity. This effect increases depending on the learning approach of teachers and/or other professionals.

3. **Mobile devices, video games and computers have a distracting effect on attention capacity when the time spent using digital technology for non-educational purposes on a school day exceeds two hours.** Adolescents who spend more than two hours on school days engaging in the non-educational use of digital technology are more likely to report attention deficit and/or hyperactivity problems, compared with those who do not. Time spent using digital technology for non-educational purposes has the effect of distracting students from educational tasks and promoting inattention or hyperactivity problems. Authors identified these issues as being associated with the routine use of digital technology for non-educational purposes. Other authors who focus on the amount of time spent using digital technology results reveal that students who report very frequent use of digital technology have a 10.5 % probability of developing Attention Deficit Hyperactivity Disorder (ADHD), a condition that interferes with functioning or development that is marked by an ongoing pattern of inattention and/or hyperactivity-impulsivity. Some research shows that students mostly agree with the setting of strict controls on the use of digital technology, as well as the need to use it in engaging and meaningful ways, ensuring its proper integration into learning activities.

The key findings identified in this section of the report enable us to make the following recommendations on dealing with the effects that children's use of digital technology has on their attention capacity:

Recommendations on digital technology and attention capacity

1. Research shows that computerised cognitive training programs can have the effect of improving children's attention capacity. The **inclusion of previous evidence** from studies in which an improvement on children's attention capacity was demonstrated is relevant for the future design, development and monitoring of computerised cognitive training programs.
2. Non-educational use of digital technology that exceeds two hours on school days can have the effect of decreasing children's attention capacity. This evidence is relevant for policy makers, teachers, families and other members of the community.
3. Effective strategies to limit the capacity of digital technology to distract children can be elaborated through collaboration between students and their peers.
4. Further research is required to determine the effects of the use of digital technology on attention capacity, depending on the teaching and/or learning approach applied.

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