



DWELL
— DIGITAL WELL BEING —

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DWELL
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DWELL

A holistic approach for the well-being in the broader digital education ecosystem



D2.1: Report with the findings and Conclusions of the Meta-Research and Literature Review in EN



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Image 1. Domains impacted by digital technologies

1 Introduction

[DWELL](#) is an Erasmus+-funded project (1 April 2025 – 31 March 2028) funded by the European Union. It is designed to empower educators across Europe with strategies and resources that promote balanced technology use and foster digital resilience among students. Through a combination of research, practical tools, and collaborative learning, the project will support schools in cultivating healthier digital habits and creating learning environments in which technology use is both meaningful and sustainable. The project is coordinated by the Education and Information Technology Center (EdiTC) based in Cyprus and involves partners from Cyprus, Poland, Finland, Romania, Bulgaria, and Greece.

The DWELL project addresses the effect of digital technologies on students' social, physical, behavioural, mental, cognitive, and emotional health. Its overarching goal is to enhance digital well-being in European educational settings. To this end, it provides educators, parents, and stakeholders with tools to promote healthier digital habits.

The project pursues four main objectives. Firstly, it aims to strengthen teachers' competencies by equipping them with practical tools and strategies to balance digital use in the classroom and to support parents in helping their children navigate digital environments. Secondly, it investigates students' digital habits, the challenges they face, and the effective practices that schools have already adopted. Thirdly, the project focuses on developing a flexible and practical framework that can be seamlessly integrated into everyday teaching and school life. Finally, the framework will undergo pilot testing in real school contexts and be refined based on direct feedback from practitioners.

The project will result in several key outputs. **FRAME DWELL** will provide a framework that focuses on teachers' digital competencies and parental engagement. **ASSESS DWELL** will be a self-assessment tool for teachers, providing personalised reports on their ability to promote digital well-being. **CERTIFY DWELL** will offer two certification pathways that address the physical, cognitive, and socio-emotional impacts of digital technology. Additionally, **AWARE DWELL** will deliver a short course for parents, designed to help them identify and address issues such as cyberbullying, excessive use, and sleep-related problems linked to digital devices.

This comprehensive approach enables the project to explore current digital practices, challenges, and successful interventions in European schools. The insights gained from this research are being translated into a practical framework that integrates digital well-

being into everyday educational practices. The framework will then be piloted in a variety of school settings to ensure both its effectiveness and its adaptability in different national contexts. By widely sharing the outcomes, best practices, and policy recommendations of the project, DWELL aims to stimulate collaboration, strengthen stakeholder networks, and establish digital well-being as a fundamental element of education across Europe. The project's goal is to ensure that digital technologies contribute positively to teaching and learning while safeguarding the overall well-being of students and educators.

It is therefore essential, as a starting point for this report, to assess the concept of digital well-being itself, its multidimensional nature, theoretical foundations, and relevance in an educational context.

2 Digital well-being

According to multiple studies that are presented below, digital well-being can be understood as a multidimensional construct. Therefore, project partners met in Sofia, Bulgaria, on 26–27 April 2025 to agree on the preliminary content of the research. At this meeting, digital well-being was conceptualised as consisting of six domains that should be examined from a holistic perspective. Each partner took responsibility for one domain in the report:

- Emotional well-being: MMC (Cyprus)
- Behavioral well-being: KLS (Poland)
- Mental well-being: EDITC (Cyprus)
- Social relationships: DIMITRA (Greece)
- Physical health: ACTA (Bulgaria)
- Cognitive functioning: ARAD (Romania)

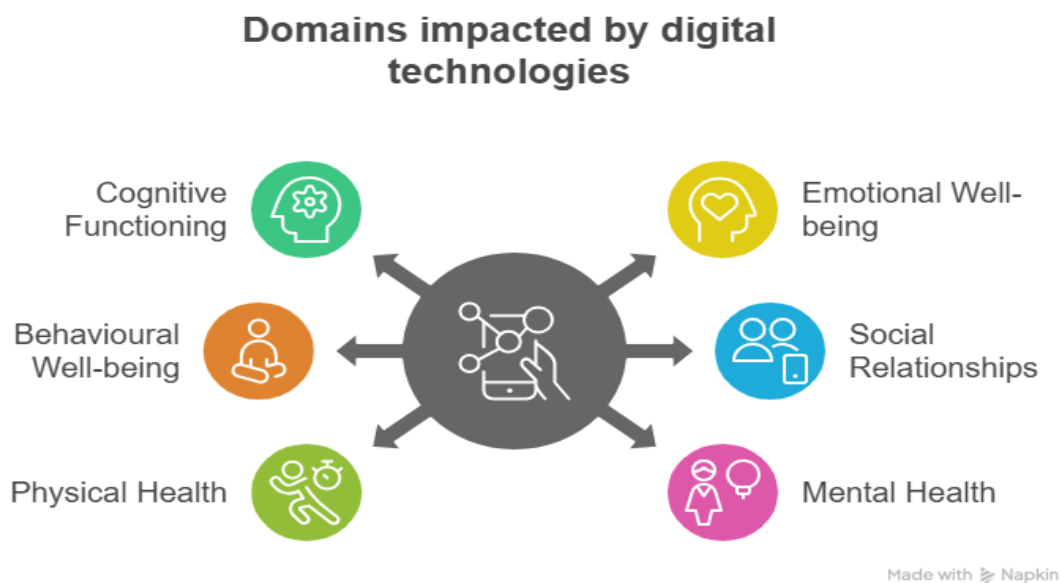


Image 1: Domains impacted by digital technologies, (NapkinAI, 2025)

The overall coordination of the report was assigned to VAMK (Finland). These six domains collectively represent the broad spectrum of factors influencing the well-being of students in digital learning environments. Approaching digital well-being holistically allows researchers and educators to capture the interactions between physical, cognitive, emotional, social, mental, and behavioral aspects of student life.

Digital well-being in education refers to the state of physical, mental, cognitive, emotional, social, and behavioral health experienced by learners and educators in a digital learning environment, and the ability to maintain a balanced, meaningful educational experience while using technology (Vanden Abeele, 2021). It encompasses both the benefits and risks associated with digital tools, aiming for a relationship with technology that enhances rather than undermines teaching and learning. In the physical dimension, this includes the impact of screen use on posture, vision, and sleep. The mental and cognitive dimensions involve sustaining attention, supporting memory and problem-solving, and fostering resilience against digital distractions. Emotional well-being relates to the ability to manage stress, maintain motivation, and mitigate the negative emotional impacts of online interactions. The social dimension involves building and sustaining meaningful relationships in hybrid or fully online classrooms, while the behavioral dimension concerns responsible and self-regulated technology use, such as avoiding over-reliance on digital tools or engaging in harmful online behavior (Wang, Chen, Yu, & et al., 2024; Burr, Taddeo, & Floridi, 2020).

According to the OECD report *The Impact of Digital Technologies on Well-Being* (Lee & Žarnic, 2024), digital well-being should be understood within the broader framework of human well-being, which also applies to educational settings. Digital technologies in schools can facilitate access to information, expand learning opportunities, and enhance collaboration between students and teachers. However, they may also introduce challenges, including reduced attention spans, cyberbullying, misinformation, privacy concerns, and disruption of healthy sleep patterns. Recognizing the multidimensional nature of digital well-being in education allows schools to implement policies, pedagogical strategies, and technological practices that actively promote both academic success and the holistic well-being of the learning community (Smits, Kim, van Goor, & Ludden, 2022).

The purpose of this paper is to examine how digital technologies in schools affect young people aged 12–15 across six domains. The analysis draws on existing frameworks, scholarly literature, and partner-country research, highlighting both positive and negative effects. Perspectives of parents and educators are also included, given their central role in shaping the integration of technology into educational practice. Both classroom tools and students' access to digital technologies beyond lessons are considered.

Each domain is explored through national and international frameworks applied by partner countries, identifying key impacts on students' well-being and learning. In addition, the report outlines the current state of digitalisation in education across

participating countries, offering a comparative view of their different stages of development and priorities.

Most of the selected digital well-being domains naturally overlap, underscoring the importance of examining them holistically rather than in isolation. The report's findings will serve as a foundation for further development of the [SELFIE Tool for Teachers](#) into which ten new questions will be integrated. These questions, based on the report's conclusions and recommendations aim to promote the digital well-being of 12–15-year-olds both in school and beyond. Ultimately, this project seeks to provide actionable insights that can guide educators, policymakers, and technology designers in creating safer, healthier, and more supportive digital learning environments.

2.1 Emotional well-being

Emotional well-being involves recognising, understanding and accepting one's emotions, effectively navigating challenges and experiencing a balance of emotions such as happiness, joy and affection alongside sadness, anxiety or stress that contribute to overall quality of an individual's emotional experiences (Sissons, 2022; Knight, 2025). For youth aged 12–15, emotional well-being refers to their level of happiness, satisfaction and the quality of their daily experiences, as well as developing skills to manage emotions and cope with challenges.

Emotional well-being is a critical component of mental well-being, encompassing overall psychological and social dimensions (Beumont, 2024). However, the definition of emotional well-being often lacks specificity, as it is frequently conflated with mental and cognitive well-being (Babakhova, Khachaturyan & Lomova, 2023). This conceptual ambiguity complicates both measurement and intervention design, particularly in the context of digital education.

Within the broader policy and research landscape, emotional well-being is rarely addressed as an independent domain, but rather embedded in wider agendas such as digital well-being, citizenship, or mental health. Frameworks like the European Commission's *Digital Education Action Plan* (2021–2027) and *DigComp 2.2* emphasize digital literacy, resilience, and safe online practices, framing emotional well-being as an indirect outcome of responsible technology use. Similarly, *DigCompEdu* and national adaptations such as *DigCompRo* target teachers' and students' competencies in managing online risks, including cyberbullying, but stop short of treating emotional

health as a primary goal (Vuorikari, Kluzer & Punie, 2022; European Commission, 2024; Joint Research Centre, 2023).

Complementing these, the *National University of Singapore framework* and the *DQ Institute's Global Digital Wellbeing Alliance* extend digital well-being to domains like emotional intelligence, empathy, and digital identity, explicitly linking emotional competence with resilience and civic responsibility (Yue et al., 2021). The *LifeComp Framework* (European Commission, 2020) also integrates emotional well-being into its personal and social competences, highlighting self-regulation, adaptability, and stress management as critical to navigating uncertainty in digital learning contexts.

Other initiatives address emotional well-being more directly. The *WHO-5 Well-Being Index* provides a validated tool for assessing emotional balance (Topp et al, 2015), while the *PiXL Digital Well-Being Package* (2025) offers structured lessons on safe online behavior and managing screen time for young adolescents. National curricula, such as Hungary's *Digital Culture* subject, similarly embed digital literacy to equip students with both critical and emotional skills (European commission, 2024).

Despite these efforts, challenges remain. Most frameworks rely on proxy indicators such as resilience or self-esteem, limiting the ability to capture long-term emotional outcomes. Moreover, scalable evidence-based training for teachers and parents is still scarce, even though their involvement is repeatedly emphasized. For the 12–15 age group—particularly vulnerable to social comparison and online pressures—this underscores the need for standardized definitions, validated measures, and targeted, age-appropriate interventions.

2.1.1 Positive Effects of Digital Technologies and Educational Practices

Numerous studies have explored the impact of digital technologies on the well-being of middle school students (aged 12-15) assessing emotional effects through focus groups and case studies. In emotional well-being, **a positive effect is defined as the experience of positive emotions such as joy, contentment, enthusiasm, happiness and pleasure, which contribute to mental health and resilience** (Ruggeri, K., et al, 2020).

The studies showed that incorporating of **gamified platforms** (e.g. *Kahoot*) into middle-school education boosts student engagement, enhancing their enjoyment, excitement, motivation, empathy and confidence in earning reward and completing interactive challenges (Zhou, 2024; Park university, 2024; Schott, 2025) Furthermore, the engagement with gamified platforms reduces the feelings of disengagement and

boredom (Meshko, H., Meshko, O. & Trubavina, 2021). Students have also reported that they felt more comfortable while using learning management systems such as Moodle as they improved their management skills, communication and academic achievement (Gudkova et al., 2021).

Educational applications constitute applications used as part of teaching. Their positive aspects in student's well-being include encouraging sense of accomplishment, raising student's perceptions of their own competence and encouraging the positive feelings connected to effective learning & lowering commuting and scheduling stress (Li & Wang, 2024).

The use of **AI** (Artificial intelligence) in education, with pedagogical intent, it can be a valuable tool for promoting well-being as it serves performance and feelings of recognition and inclusion. Moreover, the use of **online collaboration tools** such as *Zoom* and *Microsoft teams*, foster students' emotional awareness and empathy by providing platforms for effective collaboration and communication, reducing the feeling of isolation and loneliness (Turgut et al., 2025).

2.1.2 Negative Effects of Digital Technologies and Educational Practices

On the contrast, in emotional well-being, negative effect refers to experience **unpleasant emotions such as sadness, anger and anxiety, which can disrupt mental balance and resilience**. Unlike positive effects which enhance well-being, negative effects challenge emotional health but can also foster growth when managed effectively (Scott, 2025).

Although there have been positive results in gamification, some middle schools' students have expressed discomfort with the competitive nature of **gamified platforms** (eg. *Kahoot*) (Park university, 2024). Whereas AI-driven personalization can reinforce biases, foster unhealthy synthetic relations with AI agents, influencers and created personas and manipulate attention and emotion for commercial or algorithmic purposes in ways students are unprepared to recognize. These factors undermine trust, loyalty and emotional connection (Gonzalez-Ramirez, 2024).

More specifically, **gamification** and **AI tools** negatively affect interpersonal skills and emotional intelligence (Ruggeri et al, 2020). There is also a risk that external rewards may undermine intrinsic motivation, while competition can increase stress levels (Gonzalez-Ramirez, 2024). Students often struggle to navigate digital platforms and may require technical support, especially when first introduced to online education. In addition, poorly designed gamification elements or low connection could cause

frustration or feelings of inadequacy, negatively impacting self-esteem or emotional regulation. On the contrast, solo playing may reduce social connections, potentially affecting emotional well-being (Gkintoni, 2024).

Students have also reported difficulties in maintaining focus, feelings of boredom, poor reading comprehension, impaired sustained attention, negative mood changes, intrusive thoughts and frequent distractions when using **online collaboration tools** such as *Zoom and Microsoft Teams* (Turgut et al, 2025). These issues contribute to a range of emotional health concerns including social isolation, anxiety, depression and stress. Limited access to technology or gamified tools for some students could lead to feelings of exclusion or lower self-worth (Meshko, H., Meshko, O. & Trubavina, 2021)

2.2 Behavioural well-being

Behavioural well-being refers to the patterns of actions and habits that contribute to healthy functioning, learning, and social interaction. It includes how individuals regulate their daily routines, manage technology use, and develop self-discipline and constructive habits in both academic and personal contexts (Chen et al., 2020; Svoboda, 2024). For youth aged 12–15 [target group], behavioural well-being is reflected in their ability to balance schoolwork with rest, maintain positive routines, and avoid harmful behavioural patterns such as excessive screen use or disengagement from responsibilities.

Behavioural well-being strongly overlaps with emotional, social and cognitive well-being, as behaviours are closely tied to motivation, emotional regulation, and learning capacity. In practice, it covers indicators such as screen time habits, technology management skills, learning behaviours, sleep patterns and daily routines. As with other domains, the integration of digital technologies in education can influence these behaviours both positively and negatively, depending on design, implementation, and context (Xie et al., 2022).

In most frameworks, behavioural well-being is not treated as an independent domain but is embedded within broader agendas such as digital well-being, citizenship, or online safety. For example, the **UK Department for Education's Digital Wellbeing Framework** (Department of Education, 2021) addresses behavioural issues mainly through risk mitigation and statutory compliance. Its top-down approach emphasizes online safety, legal awareness, filtering, monitoring, and mobile phone restrictions, framing behaviour primarily as harm prevention rather than proactive skill-building

By contrast, the **ISTE Standards for Educators** (International Society for Technology in Education, n.d) integrate behavioural well-being into the concept of Digital Citizenship. Here, positive behaviours are cultivated through intentional pedagogy and educator modeling, with a focus on empathy, balance, safety, and civic engagement. This positions behavioural well-being as a skill set to be developed rather than a compliance issue. Similarly, **the Digital Wellness Lab Framework** Boston Children’s Hospital (Digital Wellness Lab, n.d.) applies a public health lens, defining problematic behaviours as Problematic Interactive Media Use (PIMU) and offering structured, age-specific family routines to address multitasking, poor sleep hygiene, and risky content exposure.

Other approaches are more technocentric. **The Google Digital Wellbeing Certificate** (Google, 2023) embeds habit management tools such as Focus Mode, App Timers, and Bedtime Mode into devices, though these target individual use patterns rather than broader social or educational behaviours. Taken together, these frameworks illustrate varied conceptualizations—compliance and protection (UK), civic and educational skills (ISTE), family-centered public health (Digital Wellness Lab), and technological habit regulation (Google). In this review, behavioural well-being is situated within digital education and well-being, recognizing that for adolescents aged 12–15, behavioural outcomes emerge from overlapping influences of schools, families, and digital environments.

2.2.1 Positive Effects of Digital Technologies and Educational Practices

Positive effects on behavioural well-being are often linked to digital technologies that **encourage motivation, self-regulation and constructive daily habits**. For example, **AI** is recognized as a catalyst for effective and proactive learning behaviors. Its capacity to deliver personalized and adaptive educational experiences enables students to advance at their own pace, which encourages independence and active engagement (Chen et al., 2020; Svoboda, 2024).

Intelligent tutoring systems (ITS) and adaptive content support the development of creativity and self-directed learning habits by customizing challenges to individual learners’ needs (Aravantinos et al., 2024). The integration of gamification within AI-powered education further enhances motivation, transforming learning into a more interactive and engaging process. Evidence indicates that such systems foster “deep learning” behaviors, as they prompt students to articulate their reasoning, promoting reflective and thorough cognitive processes (Chen et al., 2020). Collectively, these

attributes facilitate a transition from passive consumption of information to active, hands-on learning, forming the core of AI's positive behavioral impact.

Gamification has also been shown to promote positive behavioural patterns in classrooms. When applied effectively, it increases students' enthusiasm and engagement, reducing disruptive behaviours and absenteeism (Bai et al., 2020; Khan et al., 2017). Applications such as *ClassDojo* demonstrate how immediate feedback and reward systems can support self-regulation, collaboration and respectful conduct in the classroom. The immediate feedback and reward system helped students self-regulate and align their actions with classroom expectations, thereby creating a more orderly and productive learning environment (Barahona Mora, 2020). Beyond the classroom, gamified interventions have been found to improve adolescents' physical activity, nutrition, along with a reduction in harmful substance consumption (Rodríguez-Ferrer et al., 2024).

Learning Management Systems (LMS) can support behavioural well-being by encouraging structured study habits and autonomy. A study by Ramadhani et al. (2019) found that integrating an LMS (*Google Classroom*) with a Flipped-Problem Based Learning model provided a new digital approach compared to the monotony of traditional instruction, leading to a notable increase in enthusiasm towards academic challenges and active participation.

LMS platforms are instrumental in cultivating autonomy and self-directed learning behaviors. They provide students with the tools to take control of their educational journey, which is essential for building confidence and self-efficacy. The flexibility to access and download materials at any time allows students to engage in self-regulated learning (Furgon et al., 2023). This is supported by Firat (2016), who observed that students utilized the LMS to review content both before and after face-to-face lessons, demonstrating proactive and independent study habits. By empowering students to manage their own learning process, an LMS can reduce feelings of helplessness and foster a sense of ownership and responsibility, which are vital components of positive behavioral well-being. They also foster a sense of community when used interactively, reducing isolation and encouraging collaborative behaviours (Firat, 2016). Overall, when designed and implemented effectively, digital tools help cultivate consistent routines, motivation and proactive learning habits that strengthen behavioural well-being.

2.2.2. Negative Effects of Digital Technologies and Educational Practices

At the same time, digital technologies also present risks to behavioural well-being. A major concern is the potential for AI to promote academic dishonesty and technology

dependence. Research indicates that AI can facilitate plagiarism and the use of "paper mills," thereby threatening academic integrity (Chen et al., 2020; Svoboda, 2024). This excessive dependence may also limit student collaboration and critical thinking skills, creating a habit of seeking easy, technological answers instead of engaging in rigorous intellectual effort (Svoboda, 2024). Furthermore, frequent use of AI-driven tools has been associated with poorer interpersonal relationships and difficulties in social adaptability (Xie et al., 2022). However, the findings of that same study presented that the context and pedagogical purpose of technology use are critical factors, and that the medium of AI delivery itself is not inherently a source of behavioral problems.

Gamification may also have unintended negative consequences. Competitive elements such as *leaderboards* can increase stress, anxiety and jealousy among students who perform poorly. This social comparison can be particularly damaging to the self-esteem of lower-achieving students, creating a stressful environment where the fear of failure outweighs the motivation to participate. On the contrast, students that perform well, can have over-reliance on external rewards and risks weakening intrinsic motivation while thwart the fundamental need for social relatedness (Bai et al., 2020; Sailer & Homner, 2020).

Technical issues with digital platforms can cause disruptions and frustration, leading to a negative learning experience (Khan et al., 2017). Moreover, a poorly designed gamified system that does not align with sound pedagogical principles can fail to engage users and may even become a source of demotivation. The success of a gamified approach is highly dependent on its context and the specific characteristics of the learners, and a one-size-fits-all approach is unlikely to be effective for every student (Lampropoulos et al., 2022).

LMS platforms can likewise contribute to negative behavioural outcomes, particularly when poorly designed or implemented without adequate support. A significant risk is the promotion of passive learning behaviors, which can lead to disengagement when the platform is used as a passive storage system (Firat, 2016). While time spent on the LMS was linked to higher grades, the lack of correlation with more interactive measures like logins or hits suggests that much of this time may not represent deep, meaningful engagement. Such passivity can undermine a student's sense of agency and lead to boredom and academic alienation.

Moreover, technical barriers and a lack of institutional support can be a significant source of frustration, stress, and anxiety. When students struggle with the tool that is meant to

facilitate their learning, it can provoke significant anxiety and a negative attitude towards the course itself. This technological friction distracts from the learning objectives and can make students feel incompetent or unsupported, directly harming their emotional and behavioral well-being (Furqon et al., 2023). While the most damaging impact was seen as the feeling of isolation that can arise from a poorly managed digital environment. This sense of isolation is profoundly detrimental to behavioral well-being, as it erodes motivation and the feeling of being part of a learning community (Firat, 2016; Furqon et al., 2023).

2.3 Mental well-being

Mental well-being refers to an individual's overall psychological state, encompassing emotional balance, resilience, self-esteem, and the ability to manage stress and daily challenges (WHO, 2025; Royal College of Psychiatrists, 2020). For youth aged 12–15 [target group], mental well-being is reflected in their sense of self-worth, motivation, and capacity to maintain positive emotional and cognitive functioning in both academic and social contexts.

Within the educational setting, mental well-being is closely linked with other dimensions such as emotional, behavioural and social well-being, as digitalization influences habits, interpersonal relations, and learning engagement simultaneously (Twenge & Campbell, 2018; Keles et al., 2020).

Research and policy frameworks from the European Commission (e.g., **Digital Education Action Plan**, **DigCompEdu**), **OECD**, **UNICEF**, and **Eurydice** highlight the dual role of digital technologies: they can foster resilience and support but also pose risks when poorly managed (European Commission, Joint Research Centre, 2023; Cyprus Safer Internet Centre, 2023). Mental well-being is rarely treated as a stand-alone domain and is instead embedded in wider agendas on health, education, and child development. Reviews and institutional reports (Twenge & Campbell, 2018; Keles et al., 2020; WHO, 2025; Royal College of Psychiatrists, 2020) link digital exposure with stress, anxiety, and dependency, while also noting opportunities for resilience and skill-building.

Complementary initiatives such as the **Digital Wellness Lab** and **Harvard's Center for Digital Thriving** offer evidence-based, age-appropriate strategies to integrate digital support into schools. At the policy level, **Eurydice** and the **Cyprus education system** emphasize how competence training and infrastructure affect preparedness, while the **Behavioural Health Tech initiative** (2023) promotes digital tools like virtual therapy and mindfulness apps. Similarly, the **OECD** (2025) stresses balanced use and healthy social

interactions, and the **European Commission** (2023) recommends resilience training for educators to prevent burnout.

Taken together, these frameworks conceptualize mental well-being through interdisciplinary and multilevel approaches—public health, psychology, education, and design. For adolescents aged 12–15, a balanced and age-specific strategy is crucial to address vulnerabilities while ensuring digital education fosters sustainable psychological health.

2.3.1 Positive Effects of Digital Technologies and Educational Practices

Evidence shows that digital technologies, when purposefully integrated, can support mental well-being in schools. They provide opportunities for **self-awareness, emotional regulation and early intervention**. For example, *“digital check-ins” and classroom discussions* about online experiences help students reflect on their habits, manage stress and strengthen emotional intelligence (Weinstein et al., 2024).

Flexible digital environments, such as self-paced learning platforms (e.g. *Moodle*) reduce school-related anxiety by offering individualized content and accommodating diverse learning styles (International Baccalaureate Organization, 2021). Similarly, online therapeutic platforms, AI-based well-being check-ins and digital self-assessment tools provide early identification of at-risk students and connect them with timely support (Behavioral Health Tech, 2023).

Inclusive digital environments, such as (Google Classroom, Kahoot) have also been identified as protective factors, fostering resilience and safe school cultures where stigma around mental health is reduced (WHO, 2025). Professional development for teachers is another crucial element: training in mental health literacy and digital monitoring tools enables educators to recognize early signs of distress and provide appropriate support (European Commission, Joint Research Centre, 2023).

Finally, digital technologies support mental well-being through **mindfulness, gratitude, and social-emotional learning** directly through apps and classroom activities. These activities promote improved self-regulation, attention and reduced emotional exhaustion among adolescents (Weinstein et al., 2024; Harvard’s Center for Digital Thriving, 2024). Collectively, these practices show how digital tools, when thoughtfully designed, can enhance mental well-being in education.

2.3.2 Negative Effects of Digital Technologies and Educational Practices

At the same time, the increased use of digital technology in schools may pose serious challenges to adolescent mental health if not introduced with caution. **High screen time** has been consistently associated with lower well-being, including reduced self-control, greater distractibility and diminished emotional stability, which negatively affect academic motivation and resilience (Twenge & Campbell, 2018). Adolescents frequently report feeling digitally overwhelmed, as schoolwork and social interactions converge on the same devices, creating “always on” expectations that lead to chronic stress, sleep disruption and emotional exhaustion (Weinstein et al., 2024).

Social media use further compounds these challenges. It can increase the risk of harmful social comparison, fear of missing out (FOMO), and exposure to cyberbullying, all of which contribute to isolation, anxiety and depressive symptoms. These impacts can also reduce students’ motivation to attend school or engage in learning. (Twenge, Spitzberg & Campbell, 2022; Keles, McCrae & Grealish, 2020). These negative experiences may reduce motivation for learning, impair friendships and erode adolescents’ self-worth.

Moreover, **many schools lack adequate resources to address these challenges**. Teachers often report insufficient training to recognize or respond to mental health concerns linked to digital use, leaving them unprepared to manage classrooms shaped by digital realities (European Commission, Joint Research Centre, 2023). This gap may exacerbate student distress while simultaneously adding to teacher stress and anxiety. The cumulative impact of excessive screen exposure, emotional fatigue, disrupted sleep, social isolation and weak institutional support undermines students’ mental well-being. If left unaddressed, these risks can result in declining academic performance, avoidance behaviours, such as school absenteeism, and further emotional withdrawal (WHO, 2025).

2.4 Social relationships

Social well-being refers to the quality of an individual’s relationships, their sense of belonging, and their ability to communicate and collaborate effectively with peers. For youth aged 12–15 [target group], social well-being includes the development of empathy, social skills, and supportive peer networks, which are central to identity formation and inclusion in both educational and personal contexts (Subrahmanyam & Šmahel, 2011).

In education, social relationships are increasingly shaped by digital technologies, which expand opportunities for collaboration and participation but also create risks of isolation, exclusion, or conflict. A range of European and international frameworks explicitly address these dynamics, embedding social well-being within broader agendas of digital competence, citizenship, and inclusion.

The DigCompEdu framework (European Commission & Joint Research Centre, 2023) highlights “Learners’ Empowerment” and collaborative engagement as central competencies, positioning teachers as facilitators of inclusive peer interaction and positive online communities. Complementing this, the **SELFIE Tool** (Self-reflection on Effective Learning by Fostering the Use of Innovative Educational Technologies) provides schools with indicators to evaluate how digital tools support respectful communication, belonging, and safe collaboration (European Commission, 2023).

At the policy level, the **Digital Education Action Plan (2021–2027)** emphasizes the integration of well-being indicators into digital strategies, linking digital citizenship and socio-emotional skills to modern education. Similarly, **the UNESCO Guidelines for Digital Learning** (2023) call for equity, inclusion, and participation as prerequisites for social well-being, warning against risks of exclusion in digital systems. Going further, the **Council of Europe’s Digital Citizenship Education Framework** (directly incorporates empathy, respect, and inclusion, urging schools to combat risks such as cyberbullying, hate speech, and polarization through ethical communication and shared responsibility (European Commission, 2023).

Collectively, these frameworks situate social well-being within multi-level strategies: teachers scaffold inclusive interactions, schools embed collaboration and safety, and policymakers integrate digital citizenship and well-being objectives. For adolescents aged 12–15, who are especially sensitive to peer dynamics, such coordinated approaches are essential to ensuring that digital education fosters resilience, belonging, and positive social development.

2.4.1 Positive Effects of Digital Technologies and Educational Practices

A substantial body of academic and policy-oriented literature highlights how digital technologies—when effectively integrated into educational settings—can positively

influence students' **social well-being**, particularly among early adolescents aged 12–15. This age group is characterized by heightened sensitivity to peer interaction, identity development, and social validation, making the social domain especially relevant in understanding the impact of digital learning environments (Subrahmanyam & Šmahel, 2011).

Digital tools, when effectively integrated into schools, can enhance students' social well-being by strengthening peer collaboration, communication, and inclusion. **Learning Management Systems (LMS)** such as *Google Classroom, Moodle and Microsoft Teams* support structured group work, mutual feedback and shared responsibility, fostering a sense of belonging and competence (Brodahl et al., 2011; Best, Manktelow & Taylor, 2014).

Multimodal features like *chat functions, forums and collaborative whiteboards* provide flexible participation for students with social anxiety, neurodivergence or low confidence, promoting social equity in classrooms (Kearney et al., 2020; Livingstone & Stoilova, 2021). *Social and Emotional Learning (SEL) interventions*, such as the SELMA project, further cultivate respectful digital interaction, empathy and conflict resolution, strengthening peer dynamics both online and offline (SELMA, 2020; O'Keeffe & Clarke-Pearson, 2011; Digital Wellness Lab, 2023).

Gamified platforms such as *Kahoot* and *Quizizz* encourage collaborative competition and group engagement, which can increase participation among less confident students (O'Keeffe & Clarke-Pearson, 2011). Similarly, creative activities such as **digital storytelling** and **co-created media projects** empower adolescents to express their identities, cross cultural boundaries and develop empathy (Huang, 2017; Orben & Przybylski, 2019).

2.4.2 Negative Effects of Digital Technologies and Educational Practices

Despite these benefits, research also identifies several risks to social well-being linked to digitalization in schools. Excessive reliance on digital communication can reduce face-to-face interaction, weakening key skills such as active listening, emotional expression and conflict resolution (Subrahmanyam & Šmahel, 2011; Livingstone & Stoilova, 2021).

Students may become less confident in spontaneous, in-person dialogue, reducing opportunities for authentic social connection (SELMA, 2020).

Digital environments may also foster social isolation and exclusion, especially when online interactions displace real-world engagement. Curated social media content can intensify social comparison and “fear of missing out” (FOMO), undermining adolescents’ self-worth and sense of belonging (Twenge & Campbell, 2018; Huang, 2017). Online communication often remains brief and superficial, limiting the development of deeper interpersonal skills.

Cyberbullying and online harassment represent further serious risks, with hostile behaviours such as exclusion, hate speech and anonymous attacks contributing to social withdrawal, anxiety and long-term distrust in peer relationships (EU Kids Online, 2020; Livingstone & Stoilova, 2021). At the same time, digital exclusion—caused by unequal access to devices, connectivity or digital literacy—can marginalize disadvantaged students, reducing their ability to participate in collaborative learning environments (UNESCO, 2023; Keles et al., 2020).

Finally, **the blurring of academic and personal digital spheres** often leads to emotional exhaustion and interpersonal strain. Persistent online connectivity, combined with social pressures in group chats and platforms, can produce cognitive fatigue and stress (Common Sense Media, 2023). Together, these risks highlight the importance of structured pedagogical strategies, digital citizenship education and active adult mediation to ensure that digital learning environments foster safe, inclusive and socially enriching peer relationships.

2.5 Physical health

Physical health refers to the body’s overall condition, including posture, vision, activity levels, musculoskeletal health, sleep, and energy. For adolescents aged 12–15, healthy development requires regular exercise, sufficient rest, and ergonomically safe learning environments. The rapid integration of digital devices into classrooms supports educational innovation but also raises concerns about posture, vision, obesity,

musculoskeletal issues, and sleep. Empirical studies link excessive device use to pain, eye strain, and headaches (Domoff et al., 2019), while international analyses identify insufficient physical activity as a persistent public health issue closely tied to screen-based sedentary behavior (Guthold et al., 2019; WHO, 2019). Qualitative evidence further shows that young people themselves associate digital media use with health challenges such as fatigue and disrupted routines (Smahel et al., 2020).

To address these risks, multidisciplinary frameworks highlight strategies that balance engagement with health protection. The **Digital Wellness Lab** recommends practices such as ergonomic seating, the 20-20-20 rule for eye health, and structured breaks to counteract sedentary behavior (Sheeliya et al., 2021). National bodies, such as **Bulgaria's Council for Electronic Media**, provide age-specific screen-time guidelines and stress parental involvement in building healthy routines. Research from Sweden indicates that screen time is not always linearly associated with physical inactivity, suggesting that context and usage patterns matter (Dahlgren et al., 2021).

At the global level, **WHO**, **UNICEF**, and the **American Academy of Pediatrics** advocate balance over strict restrictions, promoting co-regulated screen use and integration of active lifestyles. For adolescents aged 12–15, who are especially vulnerable to sedentary habits, tailored interventions combining ergonomic practices, awareness of healthy routines, and regular physical activity are essential to ensure digital education strengthens rather than undermines long-term health (Pediatrics, 2016).

2.5.1 Positive Effects of Digital Technologies and Educational Practices

Although research predominantly emphasizes risks, some evidence points to benefits when digital devices are used purposefully. **Cognitive and visual benefits:** Action video games and cognitive training apps can improve visual attention, multitasking and working memory, which indirectly support physical well-being by enhancing focus and reducing strain from distraction (Green & Gilbert, 2004; Anguera et al., 2013; Jaeggi et al., 2008; Small et al., 2020).

Interactive tools: Smartboards and interactive whiteboards promote active participation, breaking prolonged sitting patterns. Their use allows for movement, such as tapping, writing or dragging items, which aligns with WHO's recommendations to counter adolescent inactivity (Guthold et al., 2019).

Reduced eyestrain through shared displays: Projectors, widely used in Bulgarian schools, allow group viewing and reduce prolonged close-up exposure to small individual screens, mitigating digital eye strain.

Apps and short movement breaks: Tablets and smartphones increasingly support apps that integrate physical activity into learning through movement-based activities or reminders, reducing sedentary risks (Oh et al., 2021).

Fitness and health monitoring: Smartphones with fitness apps or pedometers can encourage students to meet daily activity goals, supporting cardiovascular health and lowering obesity risk.

VR-based physical activity: Motion-based VR games and virtual PE programs stimulate energy expenditure and cardiorespiratory fitness, particularly beneficial for students recovering from reduced activity levels during the COVID-19 pandemic (Bae, 2023). However, VR-induced motion sickness remains a concern. Overall, digital devices can contribute to physical well-being when integrated with active pedagogies, structured breaks, and health-focused applications.

2.5.2 Negative Effects of Digital Technologies and Educational Practices

Despite potential benefits, research highlights substantial risks when digital technologies dominate classroom practices.

Sleep disruption: Extended device use, particularly at night, exposes students to blue light that suppresses melatonin and disrupts circadian rhythms, reducing sleep quality and leading to fatigue, reduced concentration, and broader health risks (Han et al., 2024; Wong et al., 2021; Nagata et al., 2022).

Digital eyestrain: Prolonged close-up viewing causes vision problems, discomfort and fatigue, often reported by children themselves (Smahel et al., 2020; Loh, 2008).

Musculoskeletal problems: Poor ergonomics and long sitting periods contribute to neck, shoulder and back strain, as well as posture deviations such as “text neck.” Studies confirm increased musculoskeletal issues among youth, underlining the importance of early prevention (Harris & Straker, 2000; Kelly et al., 2009; Marwa et al., 2018; Tsantilli et al., 2022).

Sedentary behaviour and obesity: Screen-based learning often replaces physical activity, contributing to higher obesity risks. WHO data show that over 80% of adolescents fail to meet recommended activity levels, while studies link high device use with lower physical activity and increased obesity (Kenney & Gortmaker, 2017; Serrano-Sanchez et al., 2011;

Motamed-Gorji et al., 2019; Dube et al., 2017; WHO, 2019; Hao & Cui, 2025). Although some studies report mixed or null associations (Beltrán-Carrillo et al., 2016; Dahlgren et al., 2020), the overall trend indicates concern.

Headaches and fatigue: Sustained digital use, especially under poor lighting conditions, is linked to headaches and tiredness (Wang et al., 2017).

Repetitive strain injuries (RSIs): Intensive use of keyboards and touchscreens can result in overuse injuries, particularly in the hands and wrists (Pascarelli & Quilter, 1994).

Self-reported symptoms by adolescents: Across multiple studies, children describe experiencing tiredness, headaches, eyestrain and changes in eating habits as consequences of extended device use (Smahel et al., 2020).

2.6 Cognitive functioning

Cognitive functioning encompasses processes such as attention, memory, reasoning, and problem-solving, which are fundamental for learning and academic achievement. Digitalization in education influences these processes in both positive and negative ways. On the one hand, digital tools can enhance engagement, personalization, and higher-order thinking, while on the other, they risk fragmenting attention, reducing memory retention, and encouraging superficial learning if used without pedagogical guidance. Romania provides an illustrative case for analysing this intersection between digitalization and cognitive development.

2.6.1 Positive Effects of Digital Technologies and Educational Practices

When integrated effectively, digital technologies can strengthen key areas of cognitive functioning: **Adaptation to learning styles:** Digital tools support diverse styles such as doing, watching, thinking, and experimenting (Joița, 2002). By incorporating Kolb's experiential learning cycle—concrete experience, reflective observation, abstract conceptualization, and active experimentation, students can better connect theory with practice (Istrate et al., 2025).

Access to resources: Digital platforms provide immediate access to diverse information sources, supporting globally informed and interdisciplinary perspectives. This strengthens knowledge acquisition and conceptual depth.

Simulations and virtual environments: Immersive environments foster higher-order skills such as critical thinking, logical reasoning, and decision-making by engaging students in realistic, problem-based tasks.

Visualization tools: Animations, infographics, and interactive diagrams render abstract concepts more concrete, supporting retention and comprehension.

Discovery-based learning: Digital environments encourage exploratory and action-oriented tasks, enhancing mental flexibility and cognitive engagement.

Personalization: Adaptive learning platforms create individualized learning pathways, strengthening comprehension, application, and long-term retention.

Game-based learning: Gamification sustains motivation and improves memory consolidation through interactive and reward-driven structures. Collectively, these approaches demonstrate that digital technologies can be powerful catalysts for deeper cognitive engagement and flexible problem-solving.

2.6.2 Negative Effects of Digital Technologies and educational practices

Research also highlights risks that undermine students' cognitive performance:

Reduced concentration capacity: Frequent multitasking across apps, games, and notifications conditions the brain to prefer short attention spans, limiting the ability to sustain focus during complex tasks.

Weakened memory skills ("Google Effect"): Dependence on digital storage and search engines encourages remembering *where* to find information rather than retaining the information itself, reducing both working memory and long-term retention.

Fragmented attention: Constant switching between digital tasks diminishes comprehension, retention, and self-regulation.

Superficial processing: Online environments encourage scanning and summarization instead of deep reflection and conceptual integration, limiting critical thinking and knowledge transfer.

Disrupted cognitive flow: Notifications and multitasking interfere with sustained concentration, increasing fatigue and lowering comprehension.

Externalization of memory: Habitual device use for note-taking and reminders reduces active memorization and the development of mental schemas.

Extraneous processing: Students' attention may be diverted to non-essential digital features (flashy animations, pop-ups) rather than learning content, leading to inefficient use of cognitive resources.

Filter bubbles and curated content: Algorithm-driven feeds narrow students' exposure to diverse perspectives, constraining analytical and critical thinking skills.

Information overload: Abundant access to digital resources without guidance can overwhelm students, causing confusion, anxiety, and reliance on superficial sources instead of critical evaluation. These risks suggest that digitalization, if unmanaged, may impair sustained attention, memory development, and critical reasoning—core components of cognitive functioning.

3 Country Reports on Digital Technology and Well-Being in Education

As part of the DWELL project, each partner country conducted research into the ways digital technologies are currently being used in their national educational systems. The findings reveal that the level of integration and understanding of technology in schools varies significantly across Europe. In some countries, there is a strong focus on expanding the use of digital tools to enhance learning opportunities, while in others, efforts are being made to reduce or regulate technology use due to concerns about its negative effects on students' well-being.

This section explored these differences by addressing three key questions for each country:

- What is the current state of digital technology usage in education
- How might this impact the well-being of students and educators?
- And what initiatives or actions are being implemented to address digital well-being at the national level?

3.1 Cyprus

Cyprus is advancing digital education under the **National Action Plan 2021–2025** and **the Digital Strategy 2020–2025**, though population-level proficiency *remains below the EU average*. Digital literacy is embedded in school programs such as Innovative Schools and eSafe Schools, aiming to equip students with operational, cultural, and critical competences.

Digital technology has a mixed impact on one's well-being. It can support emotional regulation and early intervention through mindfulness apps, peer support, and digital counseling, but also increases risks of stress, anxiety, cyberbullying, and screen fatigue, especially when teachers are underprepared.

To address these challenges, **the Deputy Ministry of Research, Innovation and Digital Policy and the Digital Security Authority** promote initiatives such as the planned *Digital Academy, cybersecurity training, and targeted skills development*. Schools follow GDPR and national data protection law, while CySIC provides awareness campaigns and hotlines. Balancing innovation with psychological safety remains a key national focus.

Cross-sectoral collaboration is needed to co-design environments that build both resilience and literacy, equipping students with technical and emotional skills to exercise agency in digital spaces.

3.2 Poland

Poland's **Digital Competence Development Programme 2023–2030** promotes curriculum reform, equitable access, and advanced skills such as programming and cybersecurity. Despite major investments, disparities persist between urban and rural schools, and classroom technology is often used mainly for administrative tasks rather than interactive learning.

For students, technology use brings both opportunities and risks. Excessive screen time, poor sleep, eye strain, social isolation, and cyberbullying are widespread (Safe Screen Mind 2024; Nastolatki 3.0). Multiscreening leads to concentration difficulties and emotional fatigue. Teachers also face stress, with many overestimating their digital skills and lacking systematic training.

National programs address these issues. Szkoła Dobrostanu supports school well-being, **Cyberprofilaktyka NASK** and **MegaMisja** teach safe online habits, and teacher-focused projects such as Lekcja:Enter strengthen competences for safe, balanced digital use. These represent important but fragmented steps toward a coherent well-being strategy.

3.3 Greece

In Greece, digital education expanded rapidly after COVID-19 through platforms such as Webex, e-me, and the Digital School portal have enabled continuity in teaching and paved the way for hybrid learning models, although infrastructure and access remain uneven across regions and social groups.

The impact on well-being is twofold. Gamified and collaborative tools enhance student engagement, but excessive screen time, cyberbullying, and difficulties in online interactions cause stress and isolation. Teachers have reported similar strain, facing increased pressure and socio-emotional challenges in digital classrooms.

Policy measures include EU-funded teacher training under the **Digital Transformation Strategy 2020–2025** and **Skills Labs modules** on literacy, well-being, and responsible use. The Greek Safer Internet Center (2023) highlights rising cyberbullying and

misinformation, but responses remain fragmented. NGOs like Smile of the Child and campaigns such as Safer Internet Day contribute resources, yet a national, whole-school framework is still lacking.

3.4 Bulgaria

Bulgaria's **2021–2030 Strategic Framework for Education** and the **Preschool and School Education Act** (2015) promote digital integration, supported by platforms such as edu.mon.bg, the “Digital Backpack,” and the National Teachers’ Electronic Library. While adoption has accelerated, especially since COVID-19, disparities persist between urban and rural schools, and teacher confidence remains uneven.

For students, early and frequent device use raises concerns about sleep, physical activity, and overexposure. At the same time, teachers struggle to manage attention, socio-emotional needs, and online safety, with some still relying heavily on traditional methods.

National actions include the **TechWell project**, which develops strategies and tools for digital well-being, and the **Digital Wellbeing Educators project**, which builds teacher capacity. **The Bulgarian Center for Safe Internet** provides training and awareness, while national programs like **Digital Bulgaria 2025** modernize infrastructure and competence assessments. Despite these initiatives, ensuring balanced digital use remains a challenge.

3.5 Romania

Romania is undergoing a comprehensive digital transformation in education, structured around four pillars: strengthening infrastructure, developing competences, creating innovative resources, and fostering European collaboration. The Pre-University Education Law (2023) emphasizes both critical thinking and GDPR-compliant data management. Major investments, including €881 million from the Recovery and Resilience Plan, are equipping schools with adaptable technologies and expanding nationwide connectivity. **The Digital Skills Framework for learners** (2024), aligned with **DigComp 2.2 and adapted into DigCompRo**, defines progressive competence profiles for all school levels and informs curriculum design, teacher training, and assessments.

The impact of these reforms on well-being is mixed. While infrastructure and competence development open opportunities for innovation, uneven implementation creates risks of overexposure, screen fatigue, and stress. A 2025 DigCompEdu-based report shows Romanian teachers at an intermediate proficiency level (~53.6%), with

strengths in professional development but weaknesses in collaborative learning and digital resource management. Without consistent socio-emotional guidance, students face challenges in balancing technology use and maintaining healthy learning habits.

National initiatives on digital well-being remain limited. Current efforts often consist of isolated projects rather than systemic frameworks. While Romania is steadily advancing under EU and national strategies, embedding digital well-being more explicitly into all levels of schooling is urgent. This requires targeted teacher training, structured student support, and the integration of well-being objectives alongside technical and cognitive goals, ensuring that digitalization fosters not only competence but also sustainable, healthy engagement.

3.6 Finland

In Finland, digitalisation is embedded in the **National Core Curriculum** (Opetushallitus, 2021) and supported by the **Basic Education Act** (Finlex, 628/1998), which guarantees free access to digital devices and services. A project in which a digital platform has been developed through inter-municipal cooperation DigiOne (2023) has streamlined administrative processes and provide tools for personalising the learning experience. However, research (Yle, 2023; ICILS, 2023) indicates a decline in students' multiliteracy skills. This has been linked to the limited availability of interactive, self-directed learning materials, as digital education in practice often relies heavily on static tools such as PowerPoint presentations, Moodle environments, and similar platforms.

The effects on well-being are closely monitored. Digital tools enrich learning through simulations, AI exercises, and collaborative methods, yet overuse can harm attention, mental health, and brain development (Hietajärvi, 2021). A key challenge for Finnish schools is the uneven pace of digitalisation and the varying level of digital pedagogical competence among teachers (Valtioneuvosto, 2020).

National initiatives include mobile phone restrictions in classrooms (2025), Safer Internet Centre campaigns, Finland's Digital Compass, and EU Digital Decade goals. GDPR and national data protection law add safeguards. Policymakers have proposed a cross-sectoral council to strengthen accountability and digital well-being promotion, underscoring Finland's cautious but progressive approach.

4 Conclusions and recommendations

4.1 Conclusions

This report, grounded in the investigation across six European countries, demonstrates that digital technology usage in education varies dramatically—from enthusiastic expansion in some contexts to regulated limitation in others, often due to concerns over negative impacts. The analysis across six domains of digital well-being—**emotional, behavioral, mental, social, physical, and cognitive**—revealed:

- **Emotional:** Gamification and collaboration tools can boost engagement and positive emotional experiences but may heighten competition, anxiety, and stress (e.g., competitive Kahoot usage, anxiety from AI-personalized tools).
- **Behavioural:** AI-driven and gamified learning fosters self-regulation and motivation yet may encourage academic dishonesty, dependence on external rewards, and passive learning when not well-implemented.
- **Mental:** Digital check-ins, self-paced platforms, and professional development build resilience and reduce anxiety—but chronic screen use, social comparison, and teacher unpreparedness impair mental health.
- **Social:** LMS platforms and multimodal tools support inclusion and peer collaboration. Yet, overreliance on digital communication risks reducing face-to-face interaction, fueling cyberbullying, social comparison, and digital exclusion.
- **Physical:** Interactive tools and movement-based apps can mitigate sedentary behavior, but prolonged screen use disrupts sleep, posture, vision, and physical activity, contributing to fatigue and musculoskeletal problems.
- **Cognitive:** Simulations, adaptive tools, and immersive learning environments support deep cognitive engagement and personalized learning. Excessive multitasking, superficial processing, loss of memory retention (“Google Effect”), filter bubbles, and information overload pose serious risks.

Across countries, notable differences emerge in how digital technology and well-being are approached. Romania is prioritizing large-scale investment in digital infrastructure and competence frameworks to address persistent skill gaps, while Finland takes a more cautious route, emphasizing legislation and restrictions to safeguard developing minds. Cyprus and Bulgaria have already begun embedding digital well-being into national

strategies and initiatives, integrating it into broader education reforms. In contrast, Poland and Greece are concentrating on strengthening teacher capacity and improving infrastructure, though progress remains uneven and systemic support is still limited.

Based on these findings, it can be concluded that addressing the six domains in a balanced and inclusive way is essential for supporting students' well-being and learning. Furthermore, understanding the current state of digitalisation and digital tool usage in schools provides a stronger foundation for refining the *SELFIE Tool for Teachers*. By selecting ten additional questions grounded in these results, the research does not only highlight what is prioritised at the EU level but also identifies which aspects are seen as most meaningful for the future of digital well-being in education.

4.2 Recommendations

1. Domain Integration

Future iterations of the SELFIE tool should systematically incorporate the six well-being domains (emotional, behavioural, mental, social, physical, cognitive), ensuring that digital well-being is assessed as a multidimensional construct rather than a single indicator.

2. Teacher and Parent Training

Capacity-building measures are needed to strengthen the ability of teachers and parents to support adolescents' digital well-being. Training should address the emotional, physical, and behavioural dimensions of technology use, providing strategies for prevention, early identification, and intervention.

3. Integrating emotional and social well-being into organisations

Existing digital competence frameworks mention socio-emotional skills only indirectly. Stronger emphasis should be placed on empathy, digital citizenship, and peer interaction, to ensure that emotional and social well-being are embedded in school policies and practices.

4. Physical Health and Usage Monitoring

Schools should monitor patterns of digital device use and their effects on posture, vision, sleep, and activity levels. Data on usage duration and context can inform policies and guidelines to mitigate risks related to sedentary behaviour, poor ergonomics, and excessive screen exposure.

5. Inclusion and Neurodiversity

Digital well-being strategies must explicitly account for neurodiverse learners and students with special educational needs. Applying Universal Design for Learning (UDL) principles will help ensure that interventions are accessible, adaptable, and supportive of diverse learning requirements.

6. National Policy Alignment

Given the disparities in infrastructure, digital skills, and legislation across partner countries, recommendations should be contextualised at national level. Policy development should integrate digital well-being as a core element of curricula and teacher education, supported by local legislation and funding instruments.

7. Evidence and Longitudinal Research

More robust and validated measures of digital well-being are needed to move beyond proxy indicators. Longitudinal monitoring will help capture the sustained effects of digitalisation on student health and learning, providing a stronger evidence base for both policy and practice.

4.3 Limitations

While this report provides valuable insights into digital well-being in European education, its findings must be interpreted with caution. Generalisability remains limited, particularly for neurodivergent learners such as those with autism spectrum conditions, ADHD, or dyslexia. Research shows these students often experience higher cognitive load, information overload, and communication challenges that general findings do not fully capture (Cunff, Giampietro, & Dommett, 2024). Similarly, statistical models linking screen time to addiction or learning difficulties tend to overlook outlier groups, underestimating the experiences of neurodiverse students (Seema & Varik-Maasik, 2023).

Special education contexts are also underrepresented in most frameworks, limiting applicability in inclusive classrooms or for students with complex support needs (Tomaino et al., 2021; Stalmach et al., 2023). Addressing sensory, attentional, or communicative diversity requires adaptive approaches rather than “one size fits all” solutions. Although, some of the presented technologies are designed to be personalised to respond to individual needs. Literature highlights the importance of Universal Design for Learning (UDL) and the inclusion of neurodivergent perspectives in tool and curriculum design (Durgungoz, F.C. & Durgungoz, A., 2025).

Finally, structural inequalities, such as the digital divide in rural or economically disadvantaged communities, constrain access to reliable devices, connectivity, and competences, shaping both well-being and outcomes (Beaux et al., 2024). In sum, recommendations must be applied contextually, with attention to neurodiversity, special educational needs, and equity in access.

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