# *Exploring Wellbeing Related Issues Arising From the Unregulated Use of Screen-Based Technology During Breaktimes in an International Middle School Environment*

Mary C. Kelly, Irish College of Humanities and Applied Sciences, Ireland

IAFOR Conference on Educational Research & Innovation 2022
Official Conference Proceedings

**Abstract**
The following study uses a design-thinking and mixed methods research approach to elicit students' views on the use of screen-based technology during break periods. An interest in this area emerged due to a noticeable reduction, in recent years, in the number of students spending time in outdoor play areas during morning and afternoon breaks. The context of the study is Year 1 of the IB Middle Years Program in an International IB School, in the Netherlands, which implements an inquiry-based approach to teaching and learning. The school is a 1:1 laptop, tablet, and ipad school, and the students, who are 11-12 years old, have unregulated open access to screen-based technology during lunch and break-times. This first part of the study, in line with the initial stages of the design-thinking process, involved initial exploratory interviews followed by whole-group surveys, and whole-group discussions to better understand the issue at hand. The findings indicate that students engage in a wide variety of screen-based activities during break-time, they have a range of opinions on how screen-based technology affects their well-being, and they hold differing perspectives on the need for the current levels of access to change. The students raised a number of questions surrounding the unregulated use of screen-based devices during break-times, and in a follow-up study they proceeded with design thinking approaches to generate practical solutions to the issues that were raised through this initial inquiry.

Keywords: Digital Technology, Wellbeing, Middle School

## Introduction

One-to-one laptop and ipad based programs have become a common feature in international school environments, and their use has generated a range of perspectives concerning the potential benefits and drawbacks. Research indicates that the moderate use of these devices can have a positive impact on student learning (Lei and Zhao, 2008), social connection (Charmaraman, 2017), anxiety reduction (George and Odgers, 2015), and stress reduction (Modecki, 2021), which contrasts with research that highlights the negative impacts (Kokkinaki, 2010)(Twenge, 2020a). Some of the concerns raised regarding the use of screen-based devices with younger students include the impact on cognition, sleep, and levels of physical activity (Merga, 2015), and a Danish study, on the use of ipads during break-times, demonstrated that children are less inclined to interact with others when they are on their ipads (Schilhab, 2017)**.**

Conflicting perspectives and a shortfall in conclusive research on the impact of digital devices on the wellbeing of students prompted this independent study, within an international school context, to explore the implications of the unregulated use of laptops, tablets, and ipads during break-times. An interest in the topic arose following a rise in the number of students staying inside the main school building during lunch and break-times. Play areas that were once frequented by middle school students had become sparsely populated as students congregated or sat alone in the library and in hallways with their laptops, tablets, and ipads, even on sunny days. Consequently, this study seeks to uncover students' perspectives surrounding the use of laptops during lunch and break-times, using a design thinking approach, to determine whether there is a perceived need, on the part of the students, for changes to be made to current practices.

Given that the students stood to be directly impacted by the outcome of the study, it made sense that they were included in the study in a participatory manner. Their perspectives, in line with the principles of design-thinking, informed the gradual unfolding of the inquiry which was comprised of two phases, the first of which is detailed in this paper. This initial stage included exploratory interviews, followed by surveys, and discussions with all of the Year 1 students in the Middle Years Programme. Prior to the detailing of this initial phase, it is important to consider insights that can be gleaned from research related to the topic.

## Review of Literature

In general, studies reflect a trend that points to a decrease in student wellbeing in schools since 2012 following the introduction of smart technology (Twenge, 2018). In the US, students began spending more and more time on screens, both at school and at home, and less and less time on physical activity and less time involved in in-person social interactions. Twenge found that this reduction in in-person interactions led to a corresponding increase in loneliness, results that reflect the findings of a later global study carried out across 37 countries which indicates that twice as many adolescents experienced loneliness at school in 2018 compared to 2012 levels (Twenge *et al*., 2021). A related study in Turkey demonstrated that levels of loneliness were positively correlated with the amount of time spent on screens (Ekinchi *et al.*, 2019).

The amount of time spent sitting inside on screens has also been linked to a reduction in exercise despite the fact that research indicates the importance of exercise for both mental and physical health (Carron *et al*., 2003). In general, research by Gökbulut (2019), indicates

that boys spend more time on screens than females, with boys' who are addicted to gaming, exhibiting lower levels of physical activity, and a lower sense of belonging in school compared to female students (Hazar *et al.*, 2017). In addition, a study by Wallenius (2010) which measured students' cortisol levels, suggests that long hours on ICT may cause physiological stress responses that impact attention, persistence and memory, as well as the capacity to manage social interactions in the real world, especially in busy school environments.

Interestingly, a study by Smahel (2015) indicates that children do not need to be overusing technology for the use to cause symptoms of stress. Even with moderate use, children in this study indicated physical symptoms including headaches, tiredness, and sore eyes, and mental symptoms including cognition deficits, aggressive behaviour and sleep difficulties. These problems manifest even after short periods online. This study indicates the need to pay attention to a broader range of young people with studies, as opposed to focussing specifically on excessive users.

Despite an increasing body of research that profiles the negative impact of digital technology on users, there are a number of studies that highlight the positive aspects of technology use. For example, a review of literature by Charmaraman (2017) demonstrated the beneficial aspects, including a greater sense of belonging, personal contentment, social connectivity, and emotional expression. Another study by George and Odgers (2015) highlights the role of digital technology in skill-building among shy adolescents. A further study by Wu *et al.* (2016) found that adolescents' sense of connectedness to friends and school are increased with the use of internet technology and that this connectedness is supported by positive relationships from real world experiences. This study suggests that real-life social skills are still a necessary foundation for students to be able to use technology in a beneficial way. The study recommends that schools focus on the development of social skills for real-life situations alongside the development of digital landscapes that promote connectedness among students.

Indeed, a number of emerging studies highlight that not incorporating digital technology in a moderate way in schools could prove detrimental for students' wellbeing. According to Dienlin & Johannes (2020), both low and excessive use are related to decreased well-being, whereas moderate use is related to increased well-being. Studies highlight the benefit of moderate use for stress reduction, in particular, especially when students use online programs or apps for coping with life stressors, and with managing negative emotions (Modecki, 2021).

Natural dispositions, it seems, are a determining factor in the level of use of digital technology by students. For example, individuals with a high preference for aloneness use padlets to reduce their stress levels (Leung, 2015), and a review of literature by Smith *et al.* (2021) indicates that the impact of technology on loneliness and isolation depends on whether the users are extrovert or introverted, and whether they are socially anxious, or whether they have an innate need to belong. Indeed, the review suggests that digital technology may offer valuable opportunities for less threatening social engagement for adolescents who lack interpersonal skills and confidence.

Despite the proliferation of research that explores both the positive and negative aspects of technology use among adolescents and children, there are limitations to this research. The primary concerns, according to Dienlin & Johannes (2020) are the lack of large-scale samples, the lack of research showing causal effects of digital technology use, and the lack of

consensus surrounding definitions and research methods. To begin to address this issue Orben and Przybylski (2019) carried out an analysis of large-scale social data sets in the US and found that the association between digital technology use and wellbeing was negative but very small, and too small, in their perspective, to warrant significant policy changes without further investigation. Similarly, a systematic review of research in this area by Orben (2020) makes the same point that the association between digital technology and wellbeing is weak and they call for greater consistency and efficiency in research.

Overall, there is a growing sense that the relationship between the use of digital technology and student learning and wellbeing is complicated. As Smith *et al.* (2021) claim, digital technology can have positive or negative impacts on student wellbeing, depending on how it is used, for how long, and by whom. This has prompted Dienlin & Johannes (2020) to suggest that extreme digital use may be the result of pre-existing socio-psychological problems as opposed to the direct cause of them. This perspective is important to consider, they assert, to guide the development of a deeper understanding of the factors governing gaming addiction.

Recent studies on gaming addiction have found that males, in particular, are more addicted to digital games that females and young people who play physical sports appear to demonstrate lower levels of addiction (Ekinchi *et al.*, 2019). The research suggests that a positive way to reduce gaming dependency is for parents and educational institutions to provide more opportunities for sports (Hazar & Hazar, 2018), and a study carried out in India goes as far to suggest that a national policy is needed to recognize and address technology addiction as a public health problem (Amundhan *et al.*, 2021).

Physical activities, however, are tied in with the need for outdoor areas that are conducive to movement and games. Indeed, a meta-analysis of studies carried out on the impact of outdoor spaces and greenery on students highlight the importance of being outside on the reduction of mental fatigue and increased cognitive function (Mason *et al*., 2022), both of which are primary side effects of the regular use of screens. A recent study carried out in Canada indicates that lower levels of outdoor activity are not due to an increase in screen time, but also due to an emerging belief among young people that it is safer to be indoors (Michaelson *et al*., 2020). These studies indicate that both practices surrounding the use of digital technology and changing perceptions in relation to nature have gradually led to a disconnection between young people and the outside world.

**Research Approach**

A design-thinking and mixed methods approach involving both quantitative and qualitative data was used, to explore students' perspectives, and to provide a holistic understanding of the current use of laptops, padlets, and ipads during break and lunch-times. The participant students were all in Year 1 of the Middle Years Programme, they were 11-12 years old, both male and female, and they came from a wide variety of countries and cultures.

To gather initial insights, I carried out open-ended interviews with two individual students, a Dutch boy and a Japanese boy, who were frequently inside on laptops during breaks. These insights informed the drafting of survey questions which were administered to the whole year group of 98 students. The specific questions guiding the initial survey were: Who is using technology regularly during the breaks? Who is going outside regularly? Who is happy with the current use of technology during breaks? Who feels that current practices could change?

The resulting quantitative data was shared with the students using simple pie and bar graphs, and in line with design thinking approaches, the surveys were followed by whole-group discussions with all five classes, of approximately 20 students each. The follow up discussion-based questions included: What are the laptops and other devices being used for at break-time? What are the perceived benefits or downsides of unregulated digital technology use during breaks? Are there others points that need to be raised? The resulting qualitative data was categorised into common themes, organized into an an easy-to-read table, and shared with the students.

**Findings**

The initial interviews with the two male students indicated that being on the laptops was perceived as a welcome break from school. The students played games together, as it was exciting, and both were keen to point out that it was not just game-playing, they also had some good chats together about other things. They felt that they went outside sometimes, but that it was hard to combine getting food and going outside due to logistical issues. They volunteered suggestions on how to combine game playing, getting food, and going outside.

The follow up survey questions with the five Year 1 groups, indicated that about 26% of the grade level of students were using technology regularly during the breaks, 49% of the students were exiting the school building during breaks, 30% were fine with the current situation, and 62% believed there was a need for a change. These beliefs differed across the class groups, with some classes showing a collective desire for access to digital technology to stay the same, and other classes indicating a collective desire for change. The reasons given for laptop, tablet, and ipad use during breaks were multi-fold, and included an emphasis on video games, watching Youtube videos, listening to music, posting on social media, browsing, and completing class assignments and homework. Boys from across the classes were the more prolific users, with girls being occasional users.

During the class discussions, students indicated a wide number of perceived benefits of the use of the laptops during breaks, including the development of gaming skills, stress-relief, fun, collaboration on projects, communication with friends in other places, learning new skills, escape from boredom, and the covering up of friendships issues. Students also raised a number of concerns about being on screens at lunch and breaks and these included a lack of fresh air, a lack of exercise, attention deficit issues, eye strain and a lack of social contact with other students. Several of the students mentioned that they were no longer happy to be inside using their laptops, as they felt that they were addicted to laptop use, and believed that they were not able to stop using them, even when they wanted to. A number of boys felt under pressure not to go outside, and a few had developed what they described as a *fear-of-the-outside*.

The class discussions raised additional information indicating that the students had lost access to outdoor play areas following the recent expansion of the school, and a number of students felt that they had gravitated to their laptops, padlets, and ipads as an easy option during lunch and breaks as they no longer knew where they could play outside. Students suggested that they needed help and guidance with navigating their downtime successfully, and the majority of students suggested that they would like to see a reduction in the level of access to screens during breaks. These discussions led a group of the more prolific laptop users to suggest the use of the MYP design cycle to create concrete solutions to the current laptop issue. They formed a focus group, which led to the implementation of phase two of this study. The

second phase, which extends beyond the scope of this paper, involved a focus group of Year 1 students, teachers, and administrators, and the use of the design cycle to create student-led solutions.

**Discussion**

Much as technology plays a very important role in learning, it is clear, from the students' perspectives, that an overuse of screen-based technology can lead to a variety of issues that younger students have difficulty managing by themselves without support. Apart from this, students felt that it is important for teachers to realize that the students see their use of technology in multi-faceted ways. For many, it has become a therapeutic device that they are drawn to in order to calm their nerves and to relieve stress, for others it is a means to play games and have fun with their friends, and for others a way to temporarily disconnect from what is going on around them. Their perspectives reflect what research has to say in relation to the perceived benefits of digital technology in facilitating personal contentment, emotional regulation and expression (Charmaraman, 2017), connectedness to friends and school (Wu *et al.,* 2016) and skill- building (George and Odgers, 2015).

For the more vulnerable students, the use of screens had become a decoy to hide social anxiety and a lack of friendships, and from a student support perspective, this is obviously an issue that needs to be understood and addressed in a delicate manner. Smith et *al*. (2021) have found that technology use can reduce social anxiety by offering safe opportunities for connection and confidence-building for socially anxious students, but Wu *et al.* (2016) indicate that real-life social skills are still a necessary foundation to be able to use technology in a beneficial way. As a consequence, understanding the need for both, on the part of anxious students, in particular, highlights the need to support students in the development of technology-based connectivity skills alongside skills that are conducive to in-person interactions.

The importance of recognizing that students' natural dispositions play a role in their use of digital technology is important, especially when it comes to the use of laptops for the regulation of stress. As research indicates, individuals with a high preference for aloneness, gravitate to screens in order to reduce symptoms of stress (Leung, 2015), indicating that dispositions, such as introversion and extraversion may inform the use of the use of devices during breaks. This raises the point about balance, and the need for students to have a choice, especially considering the fact that low levels of access to technology can cause anxiety (Dienlin & Johannes, 2020) whereas moderate access could enable students to cope better with life stressors (Cheever *et al*., 2014) (Modecki, 2021). This is an important point to remember before instituting change.

Whilst honouring the complicated role of the use of laptops on student wellbeing, it was clear from the results of this study that a number of students, approximately twenty-five percent, were overusing their laptops during break-times. The issue involved boys, for the most part, and they primarily spent their time playing games, to the detriment of getting outside, to eating, or to getting physical exercise, in a number of cases. The fact that the more prolific indoor laptop users were boys reflects research findings (Ekinchi *et al.*, 2019), and, not surprisingly, the recommendations to address gaming addiction is to provide opportunities for outdoor activities and sports (Hazar & Hazar, 2018). Indeed, young people who spend time outside, and play sports regularly, are less likely to become addicted to digital use, in the first place (Ekinchi *et al.*, 2019). This raised important questions for the school with regards to

how it could better facilitate access to physical activities for students during lunch and break-times, and how to address the logistical issues that were causing students difficulty in getting outside.

The fact that a number of students were consciously aware of their addiction to devices, and the fact that they were visibly concerned about it was revealing, and this is a cautionary point for schools contemplating the unregulated use of digital technology during break-times. Even though gaming addiction may occur due to complex socio-psychological factors (Dienlin & Johannes, 2020), it does not diminish the point that the regulation of devices and time spent outside has a positive balancing effect. The emergence of a *fear-of-the-outside* on the part of a number of the boys who were gaming, was particularly interesting, especially given that this is a trend that has been observed in a Canadian study which found that more young people prefer to stay indoors due to the fact that they view the outdoors as unsafe (Michaelson *et al*., 2020).

When young people are encouraged to disconnect, however, and go outside, this fear fades, and they experience a greater sense of contentment and wellbeing. It is clear, however, that a number of the students in this study need support and guidance with reacquainting themselves with the outdoor areas, and with a range of activities that encourage physical activity and in-person social interaction with their peers. The upside of these options would not just address physical activity needs (Carron *et al*., 2003), but it could also lead to a reduction in mental fatigue (Mason *et al*., 2022), and an increase in a sense of belonging (Hazar *et al.*, 2017).

**Conclusion**

This study enabled this group of Year 1 students to critically reflect on their use of screen-based technology during breaks and lunchtime. An exploration of their perspectives indicates that technology use during breaks can have either positive or negative impacts on their wellbeing, depending on what the laptops are being used for, how regularly they are being used, and whether the students are adopting a balanced approach to their use. Overall, it is clear that the unregulated use of laptops had become a problem for a number of students due to the expansion of the school, due to addictive tendencies, and due to a lack of awareness on how to address technology related concerns by themselves. The majority of students were keen to see a change to current levels of access and practices, and they were motivated to find concrete solutions to the issue. Their perspectives and involvement led to a follow up inquiry involving a focus group of students, teachers and administrators and the use of the design cycle to generate workable solutions on a systemic level. Overall, there are positive pointers, here, for the benefit of open and transparent conversations with middle school students surrounding their use of screen-based technology during downtime periods at school.

**References**


Amundhan, S., Prakasha, H., Mahapatra, P., *et al* (2021). Technology addiction among school-going adolescents in India: epidemiological analysis from a cluster survey for strengthening adolescent health programs at district level. *Journal of Public Health*, pp. 1–10.

Carron, A., Hausenblas, A., & Estabrooks, P. (2003). The Psychology of Physical Activity. *Sport Psychologist*, 17(1), pp. 118-119.

Charmaraman, l., Gladstone, T., & Richer, A. (2017). Positive and Negative Associations Between Adolescent Mental Health and Technology. *Technology and Adolescent Mental Health*, pp. 61-71.

Cheever, N., Rosen, L., Carrier, M., & Chavez, A. (2014). Out of sight is not out of mind: The impact of restricting wireless mobile device use on anxiety levels among low, moderate and high users. *Computers in Human Behaviour*, 37, pp. 290-297.

Dielin, T., & Johannes, N. (2020) The impact of digital technology use on adolescent well-being. *Dialogues in Clinical Psychology*, 22(2), pp. 135-142.

Ekinci, N., Yalcin, I., & Ayhan, C. (2019). Analysis of Loneliness Levels and Digital Game Addiction of Middle School Students. *World Journal of Education*, 9(1), pp. 20-27.

George, M., & Odgers, C. (2015). Seven Fears and the Science of How Mobile Technologies May Be Influencing Adolescents in the Digital Age. *Perspectives on Psychological Science*, 10(6), pp. 832-851.

Gökbulut, B. (2019). The Relationship Between Sense of Belonging and Technology Addiction of High School Students. *International Journal of Eurasian Education and Culture*, 7, pp. 281- 297.

Hazar, Z., & Hazar, M. (2018). Effect of Games Including Physical Activity on Digital Game Addiction of 11-14 Age Group Middle-School Students. *Journal of Education and Training Studies*, 6(11), pp. 243-253.

Hazar, Z., Tekkurşun-Demir, G, Namli., & Türkeli, A. (2017). Investigation of the relationship between digital game addiction and physical activity levels of secondary school students. *Journal of Physical Education & Sports Science,* 11(3), pp. 320-332.

Kokkinaki, A. (2010). *Primary school teachers' perspectives on the use of ICTs in education.* EDULEARN10 Proceedings. 2nd International Conference on Education and New Learning Technologies, 5-7 July, Barcelona, Spain.

Lei, J., & Zhao, Y. (2008). One-to-One Computing: What Does it Bring to Schools? *Journal of Educational Computing Research*, 39(2), pp. 97-122.

Leung, L. (2015). Using tablet in solitude for stress reduction: An examination of desire for aloneness, leisure boredom, tablet activities, and location of use. *Computers in Human Behaviour*, 48, pp. 382-391.

Mason, L., Ronconi, A., Scrimin, S., & Pazzaglia, F. (2022). Short-Term Exposure to Nature and Benefits for Students' Cognitive Performance: A review. *Educational Psychology Review*, 34, pp. 609–647.

Merga, M. (2015). Bring Your Own Device': Considering potential risks to student health. *Health Education Journal*, 75(4), pp. 464-473.

Michaelson, V., King, N., Janssen, I., & Lawal, S., et al (2020). Electronic screen technology use and connection to nature in Canadian adolescents: a mixed methods study. *Canadian Journal of Public Health*, 111, pp. 502–514.

Modecki, K., Duvenage, M., & Uink, B. *et al* (2021). Adolescents' Online Coping: When Less Is More but None Is Worse. *Clinical Psychological Science*, 10(3), pp. 467-481.

Orben, A. (2020). Teenagers, screens and social media: a narrative review of reviews and key studies. *Social Psychiatry and Psychiatric Epidemiology*, 55, pp. 407–414.

Schilhab, T. (2017). Impact of iPads on break-time in primary schools—a Danish context. *Oxford Review of Education*, 43, pp. 261-275.

Smahel, D., Wright, M., & Cernikova, M. (2015). The impact of digital media on health: children's perspectives. *International Journal of Public Health*, 60, pp. 131-137.

Smith, D., Leonis, T., & Anandavalli, S. (2021). Belonging and loneliness in cyberspace: impacts of social media on adolescents' well-being. *Australian Journal of Psychology*, 73 (2), pp. 1-12.

Twenge, J., Haidt, B., & Blake, A., *et al* (2021). Worldwide increases in adolescent loneliness. *Journal of Adolescence*, 93, pp. 257–269.

Twenge, J. (2020a). Increases in Depression, Self-Harm, and Suicide Among U.S. Adolescents After 2012 and Links to Technology Use: Possible Mechanisms. *Psychiatric Research and Clinical Practice*, 2(1), pp. 19-25.

Twenge, J. (2020b). Why increases in adolescent depression may be linked to the technological environment. *Current Opinion in Psychology*, 32, pp. 89-94.

Twenge, J. M., Martin, G. N., & Campbell, W. K. (2018). Decreases in psychological well-being among American adolescents after 2012 and links to screen time during the rise of smartphone technology. *Emotion, 18*(6), pp. 765–780.

Wallenius, M., Hirvonen., A., & Lindholm., H. *et al*. (2010). Salivary Cortisol in Relation to the Use of Information and Communication Technology (ICT) in School-Aged Children. *Psychology*, 1, pp. 88-95.

Wu. Y., Outley, C., Matarrita-Cascante, D., & Murphrey, T. (2016). A Systematic Review of Recent Research on Adolescent Social Connectedness and Mental Health with Internet Technology Use. *Adolescent Research Review*, 1, pp. 153–162.