

How EdTech Companies Are Considering Digital Well-Being in Product Development

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Abstract: Digital well-being has become an essential factor in daily life, also in education. Over the years, digital tools have supported learning processes, but as these tools gain prominence, the focus has expanded beyond innovation to include their impact on well-being. Research emphasizes that digital well-being should be integral to the design of digital learning environments. With the potential benefits and drawbacks of digital tools in mind, it is vital to understand how these tools can be designed to foster a positive learning experience without compromising one's well-being. Digital well-being means a balanced interaction with technology, optimizing benefits while minimizing harm. It is too simplistic to equate digital well-being with screen time or addictive behaviour. Discussion should include understanding on how EdTech products can enhance social connections, enable flexible learning, and support well-being. In line with this, recent research underscores the need to define digital well-being clearly, to avoid confusion between positive and negative impacts of digital learning tools. In recent years, research on digital learning has emphasized the need to prioritize not only cognitive outcomes but also the holistic well-being of learners. The design of digital learning environments must carefully consider the cognitive load imposed on learners. As EdTech products shape how teachers and learners engage with digital education, the design choices made by companies can significantly influence learning experiences and well-being. This case study aims to explore how Finnish EdTech companies are incorporating digital well-being into their product development. Through a series of semi-structured interviews with companies, we seek to understand how these companies integrate features that support learners' digital well-being, such as self-monitoring tools, gamified elements, and systems that encourage breaks or provide feedback. Moreover, we will examine how companies involve their end-users and educational institutions in the design process, and whether they utilize pedagogical and learning research expertise alongside technical development. The findings of this case study indicate that EdTech companies consider digital well-being primarily through pedagogically meaningful content, ease of use, and features that support personalised learning and self-regulation. Collaboration with educators, ethical data use, and efforts to align product design with learner's cognitive and emotional needs were also seen as essential to promoting digital well-being. Through a deeper understanding of these design processes, we aim to support the EdTech ecosystem to develop EdTech products that prioritize both educational effectiveness and well-being.

Keywords Digital Learning, Edtech, Product Development, Digital Well-being

1. Introduction

In today's interconnected world, digital well-being has become a crucial aspect of our daily lives. Digitalization is present in all areas of life, also in education. Students and teachers might be deeply engaged with technology for most of their social, personal, educational, and professional activities (Nageswaran et al, 2022). Digital tools have been used in education for several decades to support learners' learning processes. As digital applications and environments have taken a larger role in learning, researchers have highlighted that digital teaching methods should not only focus on defining innovative educational styles but also consider their impact on well-being. The digital well-being of both teachers and students should be considered, when developing new learning environments or programs, alongside accessibility and inclusion (Nageswaran et al, 2022). A recent OECD paper (2025) explores strategies to enhance child well-being in digital environments and notes that it's important that children are both protected and empowered to use digital media positively while managing potential risks (OECD, 2025).

Al Mansoori, Al-Thani and Ali (2023) conducted a comprehensive review of digital well-being and its relationship with technology design. They identified diverse interpretations of digital well-being and research gaps in its integration into design processes. The authors recommend developing a consensus definition of digital well-being, along with validated tools and frameworks. They also emphasize the need for a broader research agenda. That would enable Human Computer Interaction (HCI)- researchers and professionals to address the roles of planners and social institutions in creating inclusive and well-being-sensitive digital design. (Al Mansoori, Al-Thani and Ali, 2023)

EdTech companies' products shape the environment in which the learners, teachers and educators interact and work. The design choices of EdTech companies influence the learning and digital well-being experiences in education. This case study aims to explore how EdTech companies take digital well-being into account during product development. Specifically, the study examines how EdTech companies design their products to support digital well-being for instance through providing learners with opportunities to track their progress and shape their own learning paths. The edtech products offered by the companies participating the study have different characteristics. Some products are designed to be interactive and support collaborative learning in a school context, while others are designed for independent learning. The study focuses on examining the product design processes of EdTech companies, not the companies' individual products. The case-study is based on semi-structured interviews conducted online in early 2025 with representatives of six (N=6) Finnish EdTech SMEs.

2. Defining Digital Well-being

It is important to define digital well-being clearly, so that it can be understood across different contexts and studied in a consistent and meaningful way. The term needs to be set apart and expand from the associated discussion on digital harm, such as excessive screen time or addictions to mobile phone use. It should be noted that digital technologies are useful for people, for example to support the creation of social relationships, to enable learning at any time and place, to support health maintenance, etc. (Vanden Abeele, 2021).

The Council of the European Union (2022) defines well-being in digital education as a state of physical, cognitive, social, and emotional contentment that enables individuals to engage positively in digital learning environments. This includes using digital education and training tools and methods to maximize their potential and self-realization, act safely online, and support their empowerment in online environments (Council of the European Union, 2022, p. 5).

Personalised learning supports student well-being by addressing individual needs, preferences, and learning styles in digital environments. According to the Council of Europe (2024), digital well-being can be supported by adapting devices and tools to the specific needs of learners. However, and at the same time, there is also a risk that digitally personalized learning will increase inequality between students who have access to the latest digital learning environments and those who do not have the necessary computers and connections (Council of Europe, 2024). Vanden Abeele (2021) expands on this by describing digital well-being as a subjective individual experience of optimal balance between the benefits and drawbacks of mobile connectivity. This individual, subjective experience involves emotional and cognitive elements from the individual's everyday life. People achieve digital well-being when they experience maximal controlled pleasure and functional support, along with minimal loss of control and functional impairment. Vanden Abeele (2021) emphasizes that digital well-being is a dynamic system influenced by person-, device-, and context-specific factors. To understand how individuals can attain digital well-being, it is essential to examine the interactions between persons, devices, and contexts. (Vanden Abeele, 2021)

3. Digital Well-being in Education

Recent studies have shown that digital teaching and learning have both beneficial and detrimental effects. This ongoing discussion about online learning design emphasizes the importance of approaches that support the overall well-being of learners, not just their cognitive achievements (Palalas and Doran, 2024). Nageswara et al. (2022) review highlights the profound impact of the digital learning revolution, which has enabled almost all learning outcomes to be achieved or assessed online. This shift has potentially contributed to an 'always on' culture, with students spending extended periods in digital environments. The researchers highlight the importance of balancing education and technology to promote safe digital well-being. They argue that while developing innovative educational methods is crucial, equal attention must be paid to understanding the potential well-being implications of these digital transformations. The key concern is not just about creating new digital learning approaches, but also about thoughtfully examining their broader impacts on students' holistic well-being. This perspective underscores the need for a nuanced approach to digital learning that prioritizes both educational effectiveness and individual wellness. (Nageswara et al, 2022)

The contextual nature of digital well-being is particularly evident in digital learning applications, where individuals often have limited choice in using digital tools to complete their studies (Vanden Abeele, 2021). Skulmowski and Xu (2022) provide insights into the critical relationship between cognitive load and digital learning environments. Their research review emphasizes that while learners must invest some extraneous cognitive load to enable meaningful learning processes, excessive cognitive burden can undermine learning

effectiveness and digital well-being. The design of learning, support, and assessment in digital environments is crucial. The researchers argue for a nuanced, cost-benefit approach to digital learning, highlighting the importance of carefully aligning design factors, cognitive processing, and assessment methods. If this alignment is not achieved, the potential benefits of digital learning may be overshadowed by cognitive costs. At a practical level, supporting learning and well-being in technology-enhanced environments depends on two key factors: the tools and features of educational technology platforms, and the teacher's competence in designing learning situations that facilitate learning without unnecessary cognitive burden. (Skulmowski and Xu, 2022)

3.1 Promoting Digital Well-being in Learning

Digital learning environments are created and used in different ways to support the individual learning process. Some environments may emphasize interactivity, and others may be designed to support independent learning. It is important to utilize the various tools and features of the environments so that the learning process is as smooth as possible. Designing such learning contexts requires pedagogical and digital competence from the teacher (Haarala-Muhonen et al, 2023).

Salmela-Aro et al, (2022) emphasize the need for targeted support in developing teachers' digital skills, along with new training opportunities during the implementation of technology in education. According to Salmela-Aro et al, distance and hybrid learning platforms should be built to support genuine seamless interaction. Their research shows the potential of educational games and apps to support young people's motivation to learn and their well-being. Instead of banning the use of digital devices, young people should be taught to use them in meaningful ways to support their learning and well-being. Salmela-Aro et al. (2022) research also noted that young people should be offered support to regulate their own digital activities. This will enable them to use digital solutions appropriately and find a balance between different aspects of their lives.

The capabilities of digital environments and EdTech applications enable diverse learning opportunities and support the design of effective learning strategies. Balica (2021) has highlighted several useful strategies that support learning. The first strategy is increasing the engagement of learners. Student engagement is determined by the interaction of time, effort and other essential resources that optimize the student experience and learning outcomes. This strategy includes features that enable gamification of learning, digital stories, digital engagement and resilience. The second key element is improving self-directed learning skills. The assumption is that students who consider themselves highly competent in self-directed learning are more motivated to learn. Several practices can support self-directed learning in the digital environment and have shown promising results e.g. support for metacognitive skills, workload management and mindfulness. The third element is overcoming isolation. While there is wide evidence on the impact of loneliness and social isolation on the well-being of children and young people, there is still little evidence on the effectiveness of specific interventions in preventing or reducing the effects of loneliness in the digital environment. However, several practices have shown promising results. These include the social presence model, peer counselling and backchannelling opportunities in digital environments. (Balica, 2021)

According to the OECD (2025) report *How's life for Children in the Digital Age?* supporting the digital well-being of children requires a comprehensive, whole-of-society and rights-based approach that balances opportunities and risks. Key strategies include implementing effective legal and technological safeguards that prioritise child safety, enhancing digital literacy through schools and teachers, providing parents and caregivers with practical guidance, and ensuring children's voices are reflected in digital policymaking. (OECD, 2025)

4. Research Design

This study used a qualitative research design to explore how educational technology (EdTech) companies consider digital well-being in the design of their products. Given the exploratory nature of the research question and the limited existing literature on the topic a qualitative approach was chosen. Semi-structured interview was selected as the method of data collection. This allowed the in-depth exploration of participants' perspectives while allowing flexibility to include emerging topics during the conversations.

4.1 Participant Selection, Data Collection and Analysis

Participants were selected from among the members of a national EdTech association, which represents a broad range of companies operating in the EdTech sector. The inclusion criteria focused on founders and employees of small and medium-sized enterprises (SMEs) as these types of companies often have a significant role in

innovation and product development in the field. A total of six companies participated in this case-study. Each company contributed one or more participants involved in product design, development or strategy ensuring a relevant and informed perspective on the topic.

The data were collected through semi-structured interviews conducted online. This format allowed access to participants across different geographic locations and allowed for scheduling flexibility. All interviews were video recorded with participants consent and then transcribed for analysis. The interview included open-ended questions designed to produce rich narratives around digital well-being considerations in EdTech product design, while allowing participants to bring up unanticipated topics.

The interview transcripts were analysed using content analysis. Multiple researchers were involved in the coding process employing investigator triangulation to enhance the credibility and trustworthiness of the findings. This included cross-checking each other's coded data and interpretations helping to ensure consistency and reduce individual research bias.

4.2 Ethical Considerations and Researcher Positionality

The ethical principles of the Finnish National Board on Research Integrity were upheld throughout the study (TENK, 2019). Informed consent was obtained from all participants prior to the data collection. Participants were assured of the confidentiality and anonymity of their responses, and all data were stored securely.

The research team conducting this study has a background in education, with practical experience in supporting and training teachers in the use of EdTech tools. While the members of the team have previously collaborated with some companies in the Finnish EdTech ecosystem, none of the companies included in this study were personally known to the team members at the time. Although the members of the research team were familiar with some of the products developed by the participating companies there had been minimal prior contact with the individuals who took part in the interviews.

The study was collaboratively designed by the research team and all the interviews were conducted by members of the team. Data analysis was led by two researchers while the remaining team members reviewed and cross-checked the coded material. This collaborative approach, including investigator triangulation, was used to minimize individual bias and strengthen the trustworthiness of the analysis. The team's professional background in education and existing knowledge of the EdTech sector informed the interest in the topic of digital well-being, while ongoing reflective discussions within the team helped remaining critically aware of how individual perspectives may have shaped the research process.

5. Results

This chapter explores how EdTech companies develop their products in collaboration with pedagogical and technical experts, as well as end users such as teachers and learners. The findings from the interviews show that user feedback, research-based knowledge, and iterative design processes play a key role in product development. Particular attention is paid to how digital well-being is supported through intentional product design that prioritizes pedagogical relevance, user-friendliness, and meaningful use of screen time. The chapter also discusses product features that promote digital well-being, such as personalization, time management tools, and feedback mechanisms. Furthermore, challenges related to implementing these tools in educational settings are addressed, along with suggestions for improving collaboration between schools and EdTech developers. Finally, the chapter looks ahead to future developments, including the role of artificial intelligence, the need for national evaluation frameworks, and the importance of accessible, mobile-friendly learning solutions.

5.1 Edtech Companies' Perceptions on Digital Well-being

In the interviews, participants discussed both the concept of digital well-being in general and the specific features in their own companies' products. Interviewees viewed the ability of digital solutions to enable personalized learning and tailored support as a key aspect of digital well-being. The participants also emphasized the importance of using the latest research to guide product design and promote the digital well-being of the users. Moreover, the interviewees referred to the ongoing debate about screen time and pointed out the importance of a pedagogical approach to product design. They noted that with thoughtful pedagogical planning, screen time can be meaningful and support learning.

From the perspective of the interviewed EdTech companies' representatives, digital well-being is supported when a product remains focused on the specific educational need it was designed to address. The responses emphasized the importance of the product's content, and the pedagogical considerations integrated into the design process of the product. EdTech companies recognize that their products contribute to the daily total amount of screen time for their users. According to the interviewees an EdTech product should be purpose-driven, addressing the specific educational need for which it was developed. It should also be user-friendly and free from e.g. unnecessary gaming elements. A key factor identified as supporting digital well-being was the product's capacity to help learners to visualize their learning journey and monitor their progress.

5.2 How EdTech Companies Collaborate With Users and Professionals

All participating companies acknowledged the importance of collaborating with users and gathering feedback as an essential part of product development. Feedback was collected in various ways, for example through user interviews, observing classroom situations, sending email surveys, and through feedback mechanisms in the product itself. Companies also received indirect feedback from end users of the product through their customers.

The interviews indicated that most companies involve a multidisciplinary team in product development, including pedagogical and technical experts, as well as end users such as teachers and learners. The methods for collecting feedback varied depending on the type of product. For example, feedback for products designed for independent learning was often gathered online, while products intended for use in structured classroom environments allowed for more direct interaction and discussion with users.

In addition to the company's own staff, companies also engaged external experts in the product development process when appropriate. Some interviewees also noted that current research played a role in product development, and in some cases the product may have also received its initial impetus through research.

5.3 EdTech Product Features Supporting Digital Well-being

EdTech companies seek to promote users' digital well-being by ensuring that their products are pedagogically relevant and that the time spent using them effectively supports learning. Interviewees pointed out that digital well-being is fostered when products are both easy to use and aligned with the user's learning needs. Depending on the product's purpose, some applications include features that track time usage or put time limits on use. These features are often designed with attention to cognitive load and learning efficiency – for example, by considering how much new information a learner can reasonably process within a given time. In some cases, the application may restrict usage to a single training session per day or limit session duration to a set number of minutes.

Some products include gamified elements into their products with to motivate and engage learners. However, the interviews made it clear that such features were included only when they were thought to add value for the learner and the learning process. From the perspective of digital well-being, it was considered important that the time spent using the application directly contributes to learning. To support this, some EdTech products employed algorithms adapt to the learner's individual progress, thereby personalising the learning path. In addition, these applications could provide immediate feedback on the learner's actions and tips for moving forward.

In some cases, the algorithm's functioning and the resulting recommendations for the learner's next steps were made directly visible to the user. In other products, the data collected by the application was shared with the teacher, enabling them to monitor progress and intervene when necessary. The ability to use the application independently, regardless of time and location, was also seen as a feature that supports digital well-being, as it allows learners can determine when and where they study. Table 1 describes the design aspects that EdTech companies consider in their product development and how they believe these principles impact digital well-being.

Table 1: Designing EdTech products that promote digital well-being

Aspect	How it Supports Digital Well-being
Pedagogical focus	Ensures that all content serves a clear learning purpose; avoids unnecessary or distracting features
Ease of use	Reduces cognitive load and makes the product accessible for diverse users
Meaningful use of time	Encourages screen time that is directly tied to learning goals; includes timers or use limits
Personalisation and autonomy	Supports learner agency through adaptive learning paths and progress tracking
Feedback and guidance	Enhances motivation and reflection through timely, learner-specific feedback
Collaboration with users and experts	Involves teachers, learners and experts in designing and testing to ensure relevance and usability
Teacher support	Helps educators implement the product effectively with training
Responsible data use	Use of learning data ethically to personalize and inform educators

5.4 Challenges and Suggested Solutions in Supporting Digital Well-being Through EdTech

One of the key challenges identified in promoting digital well-being was the effective implementation of an application's pedagogical approach, especially in classroom settings. To integrate these tools successfully into classrooms, teachers need strong pedagogical skills and continuous, open communication with EdTech developers. This cooperation was viewed as essential for both sustaining and enhancing the meaningful use of educational technologies.

Another challenge mentioned was the limited expertise among school and educational staff in evaluating and procuring appropriate digital products. The interviewees expressed the need to develop this capability to ensure that the tools used in schools align with their pedagogical goals. Teachers also needed more support to learn how to use EdTech tools effectively in their teaching. One interviewee stated that the game elements of the products can distract the learner if no guidance is given. It was also noted that there can be confusion due to a lack of shared language – both about how the product works and how it is designed to support learning. A suggested solution to these problems was closer cooperation between EdTech companies and schools, especially when putting the tools into practice.

The recent widespread debate about screen time and its effects on children and young people was also mentioned by several interviewees. As a solution to this issue, representatives of the EdTech companies stated that this is precisely why their products are easy to use and focus specifically on supporting learning without additional sections or features. The importance of developing nationally recognized criteria for assessing EdTech products was also highlighted. Such criteria would support schools and teachers in selecting safe and reliable EdTech tools.

Some company representatives expressed frustration with the often-polarized nature of public discourse surrounding digital well-being, where EdTech is seen as inherently harmful or entirely beneficial. They pointed out that this kind of thinking ignores the fact that well-designed products, which follow principles that support digital well-being, can also enhance learning and provide practical solutions for today's educators and learners.

5.5 Future Perspectives on Digital Well-being in the EdTech Sector

Discussing future development, artificial intelligence and its possible effects on product development and supporting learning was mentioned by all interviewees. There was some concern about whether the use of artificial intelligence would make learners lazy and their learning processes would remain superficial. However, AI agents were also considered having the potential to support the learners. It was also emphasized that only pedagogically effective digital tools should be made available to schools. Products that focus on entertainment should be restricted from lessons. At the same time, the need for a national evaluation framework, that could identify and implement the best solutions for schools and teachers is recognised. As some of the interviewees expressed, there is a need for national-level dialogue and collaboration to guide the efforts of teachers, schools, and procurement officials. They also emphasized the need for a shared framework that would provide decision-

makers with sufficient information to support informed choices regarding the procurement and use of Ed Tech solutions.

According to answers, it remains crucial that EdTech products support teachers' work as well as students' learning and the products should not unnecessarily burden them. On an international level, it emerged that learning solutions should be developed primarily for mobile devices which can also operate with weak or no network connection ("semi-offline"). The goal is a wider accessibility globally and a better scalable user experience, especially on mobile phones.

6. Conclusion

From the perspective of digital well-being, EdTech companies report that they aim to create easy-to-use and pedagogically sound products that support learning in different ways. The products may contain gamified elements, provide feedback on learning and insight on one's own learning path. They also may include opportunities for community building and interaction. Based on previous research, these elements are known to support digital well-being (e.g. Balica, 2021). The companies use experts in pedagogy, learning content and technology to design their products, and they also gather a wide range of feedback from users. Despite the positive cooperation to date, this case study revealed that EdTech company representatives expressed a wish for deeper engagement with end users (schools, teachers) to ensure that their products are effectively integrated into the school or educational context for which they are designed. Furthermore, the findings also underscored the critical role of teachers' digital pedagogical skills in maximizing the educational value and practical use of these products.

In Finland, schools and teachers have considerable autonomy in selecting EdTech applications (e.g. Kupiainen, 2022). However, this choice can be challenging due to various security and usability concerns that may be difficult for individual teachers to evaluate. Sometimes the application might be avoided altogether for safety reasons. A more structured cooperation between EdTech companies, educators and policymakers appears essential for fostering sustainable, pedagogically grounded and digital well-being-oriented use of digital tools in education. The interviews highlighted the need to maintain an active EdTech ecosystem that would enable, at least nationally, ongoing dialogue with EdTech application creators and education representatives. The point was also made that the EdTech field should take more account of scientific research results on individual and group learning in technology-enhanced learning environments

Future research could benefit from expanding the sample to include a broader range of perspectives beyond Finnish EdTech companies. It could also be valuable to investigate how teachers understand and address digital well-being in their everyday work when using EdTech tools in classroom. Additionally, further research is needed on how to build an active and collaborative EdTech ecosystem, that brings together developers, educators, researchers and policymakers.

Ethical Declaration

The ethical principles of the Finnish National Board on Research Integrity were upheld throughout the study.

AI Declaration

Artificial intelligence tools have been used text formatting to improve the readability of the text.

References

- Al-Mansoori, R.S., Al-Thani, D. & Ali, R. (2023) 'Designing for Digital Well-being: From Theory to Practice a Scoping Review', *Human Behavior and Emerging Technologies*. August, 2nd <https://doi.org/10.1155/2023/9924029>
- Balica, M. (2021) "Supporting student well-being in a digital learning environment", International Baccalaureate Organization. Available at <https://www.ibo.org/research/wellbeing-research/supporting-student-wellbeing-in-a-digital-learning-environment-2021/> [Accessed 20 May 2025]
- Council of Europe, 2024. *Digital Citizenship Education*. [online] Available at: [https://www.coe.int/en/web/education/digital-citizenship-education#{%22271421625%22:\[0\]}](https://www.coe.int/en/web/education/digital-citizenship-education#{%22271421625%22:[0]}) [Accessed 20 May 2025].
- Council of the European Union, 2022. *Council conclusions on supporting well-being in digital education*. Official Journal of the European Union, C 469, pp.19–26.

- Haarala-Muhonen, A., Myyry, L., Pyörälä, E., Kallunki, V., Anttila, H., Katajavuori, N., Kinnunen, P., Tuononen T. (2023) "The impact of pedagogical and ICT training in teachers' approaches to online teaching and use of digital tools", *Frontiers in Education* Vol 8 No. September <https://doi.org/10.3389/feduc.2023.1223665>
- Kupiainen, R. (2022) "Making the "digital leap" in Finnish schools", *Nordisk tidsskrift for pedagogikk og kritikk*, 8. <https://doi.org/10.23865/ntpk.v8.4068>
- Nageswaran P, Leedham-Green K, Nageswaran H, Madeira Teixeira Baptista AV.(2022) "Digital well-being: Are educational institutions paying enough attention?2 Commentary in *Medical Education*, 57(3), pp 216-218. doi:10.1111/medu.14977
- OECD, 2024. *The impact of digital technologies on well-being*. [online] Available at: https://www.oecd-ilibrary.org/social-issues-migration-health/the-impact-of-digital-technologies-on-well-being_cb173652-en [Accessed 20 May 2025].
- OECD (2025), *How's Life for Children in the Digital Age?*, OECD Publishing, Paris, <https://doi.org/10.1787/0854b900-en>.
- Palalas, A. & Doran, M. (2023) "Digital Wellness Framework for Online Learning", *Canadian Journal of Learning and Technology*, 49 (3) <https://doi.org/10.21432/cjlt28581>
- Salmela-Aro, K, Alho, K, Lonka, K, Upadyaya, K, Vinni-Laakso, J & Ronkainen, I. (2022) *Kouluyhteisön hyvinvointi ja digitaalisuus tasapainoon: Politiikkasuositus*. Suomen Akatemian Strategisen tutkimuksen neuvosto. Available in Finnish https://helda.helsinki.fi/bitstream/handle/10138/350642/22_11_kouluyhteison_hyvinvointi_ja_digitaalisuus_tasapainoon_11_2022final.pdf?sequence=1 [Accessed 20 May 2025].
- Skulmowski, A., Xu, K.M. (2022) "Understanding Cognitive Load in Digital and Online Learning: a New Perspective on Extraneous Cognitive Load", *Educational Psychology Review* 34, pp. 171–196. <https://doi.org/10.1007/s10648-021-09624-7>
- TENK, 2024. The Finnish Code of Conduct for Research Integrity. Available <https://tenk.fi/en/research-integrity-ri>
- Vanden Abeele, Mariek M P. (2021) "Digital Well-being as a Dynamic Construct", *Communication Theory*, 31, (4), pp. 932–955, <https://doi.org/10.1093/ct/qtaa024>