

From Digital era to Digital Wellbeing era

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Abstract. This study examines the concept of Digital Wellbeing (DWB), an emerging indicator of 21st-century quality of life. Using bibliometric analysis, 182 peer-reviewed articles from the Scopus database were analyzed to identify trends and patterns. Co-occurrence analysis of 689 keywords, visualized via VOSviewer, uncovered eight thematic clusters, including digital health, social media, digital addiction, privacy, and ethical design. The findings reveal a spectrum of perspectives, from optimistic views on technology's ability to enhance human flourishing to critical approaches addressing its drawbacks. This study underscores the need for balanced, user-centered approaches to DWB, urging designers, policymakers, and researchers to prioritize ethical and sustainable practices. By mapping the intellectual structure of DWB, this research contributes to its conceptualization and provides a foundation for future empirical studies aimed at fostering a deeper understanding of the relationship between technology and human well-being.

1 Introduction

The question of what constitutes a “good life” (well-being) is a question that preoccupies human thought and has been situated at the center of philosophical and scientific research since ancient times. In recent years, rapid technological developments, environmental problems, and the recent experience of the Covid-19 pandemic have strengthened the relevant reflections of humanity and have led to discussions and revisions of the values and priorities of human beings and societies.

In ancient Greek philosophy, there are two dominant tendencies of thought about well-being, the hedonistic approach and the eudemonic approach[1]. Hedonic well-being considers pleasure to be of the highest value, while eudemonic well-being refers to the full flourishing of the human potential. The conditions of the "good life" in terms of economic and social indicators are studied and measured by economists and sociologists and statistical reports are published to support the efforts of humanity to compare and improve living conditions globally. Such indicators are the ones taken into consideration by the Better Life Index which is calculated by the Organization for Economic Cooperation and Development (OECD), namely: work-life balance, sense of security, life satisfaction, health, civic participation, environment, education, society, work, income, housing[†]. It is very interesting that among

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[†] <https://www.oecdbetterlifeindex.org/>

the above well-being parameters figures subjective satisfaction with life that is “Subjective Well-being”, a psychological term that refers to people's self-evaluation of their lives [2]. In recent years a new concept has emerged, that of Digital Wellbeing (DWB), which is becoming an increasingly important indicator of the quality of life in the 21st century[3]. However, there is still no consensus regarding the definition and use of the term. The purpose of this study is to explore the intellectual structure of the DWB research field and uncover the dominant emerging trends. The current landscape of the DWB literature is mapped through bibliometric analysis.

2 Materials and Methods

The research was conducted during December 2023 and January 2024. To conduct the research, the term “digital wellbeing” and its different spellings were used as search keywords. To prevent research results from being biased we decided to search solely for the exact term and not for word combinations based on our past understanding of the subject. The search string was formulated as follows: (“digital wellbeing” OR “digital well-being” OR “digital well being”) and was used on the title, abstract and keywords field (TITLE-ABS-KEY). For this search the Scopus database returned 210 records. Inclusion and exclusion of articles was based on screening titles and abstracts. 182 articles focusing on or relevant to DWB were selected. 28 documents were excluded: 3 documents published in languages other than English, 6 summaries of Conferences, 14 book chapters and 2 papers not accessible in full text, 1 non-peer-reviewed material and 2 papers not relevant to DWB.

VOSviewer software was used for data analysis and visualization. Basic clustering was done automatically by VOSviewer based on the co-occurrences of the authors' keywords, while notes from manual data extraction process were used to interpret the results. The dataset used in this study is available online[‡].

3 Findings

The term “Digital Wellbeing” was used for the first time in 2012 in the article *Children and Digital Wellbeing in Australia: Online regulation, conduct and competence* [4] which presented a salutogenic approach to digital media literacy and cybersafety that promotes the knowledge and skills children need to participate online actively, ethically, and critically, without concentrating only on risk protection measures. However, the search in Scopus database did not return works published earlier than 2015 (see Fig.1).

DWB appeared as an emerging concept preoccupying researchers during the years after 2015. Intense scientific interest peaked during the Covid-19 pandemic and continues in the post-Covid era. The main topics of concern are: Social media, (general) Well-being, Mental health, Digital addiction, Artificial Intelligence and Healthcare. The Covid-19 pandemic and subsequent lockdown experience have apparently shifted the agenda on issues related to Social media, (general) Well-being and Mental health (see Fig.2).

[‡] <https://drive.google.com/drive/folders/1P9T88zFTk7qPLryPqG9ouCpG-248Fvn2?usp=sharing>

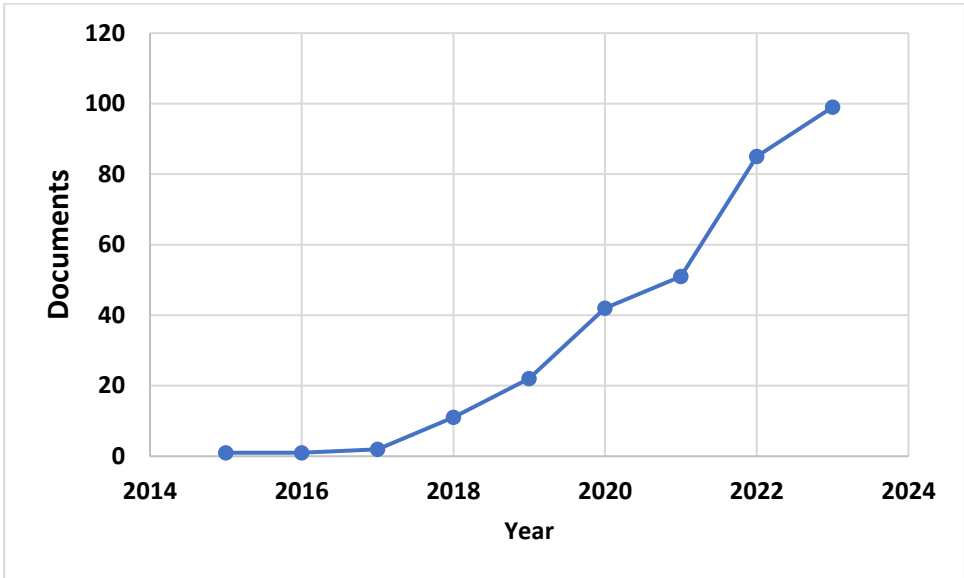


Fig. 1. Annual scientific production

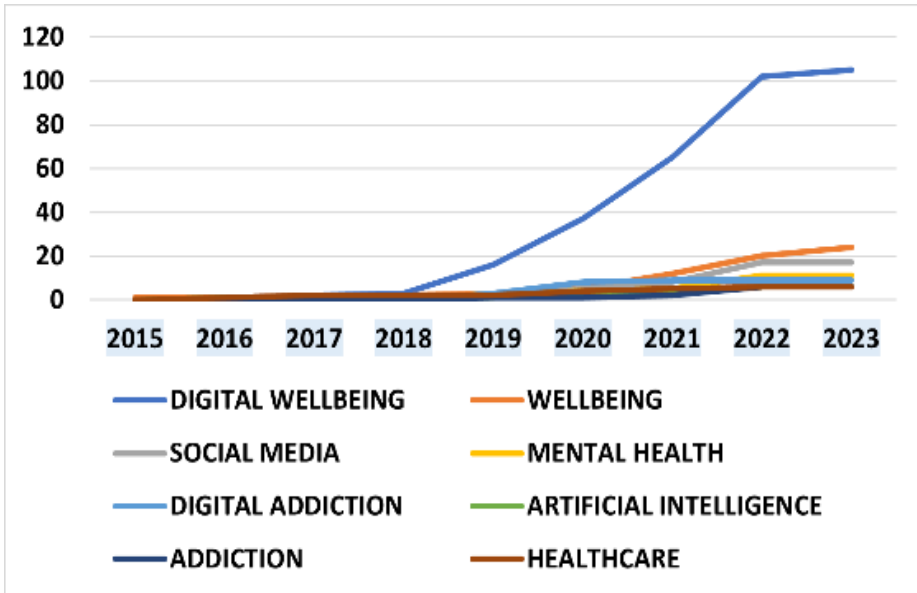


Fig. 2. Thematic evolution per year

To reveal the knowledge structure of the DWB research domain, we conducted a co-occurrence author keywords analysis using the VOSviewer software that facilitated the identification of patterns and current scientific trends (see Fig.3). The size of the nodes in Fig.3 indicates the occurrences of the keywords, while the thickness of the line indicates the strength of the link. Clusters are indicated by different colors. A map of 8 clusters was created based on analysis of 689 author keywords. Initially, there were 702 keywords, which were

then merged to normalize spellings and plurals using a thesaurus file, as indicated in the VOSviewer manual[§]. For instance, the label “digital well-being” substituted “digital well-being”, whilst in some cases labels have been replaced by their plural form, e.g., smartphone was replaced by smartphones. Of the aforementioned 689 keywords, 48 met the minimum threshold of 3 occurrences. For each of the 48 keywords, the total strength of the co-occurrence links with other words was calculated. The top five keywords are “digital well-being” with 106 occurrences, “well-being” with 21 occurrences, “social media” with 17 occurrences, “mental health” with 11 occurrences and “digital addiction” with 9 occurrences.

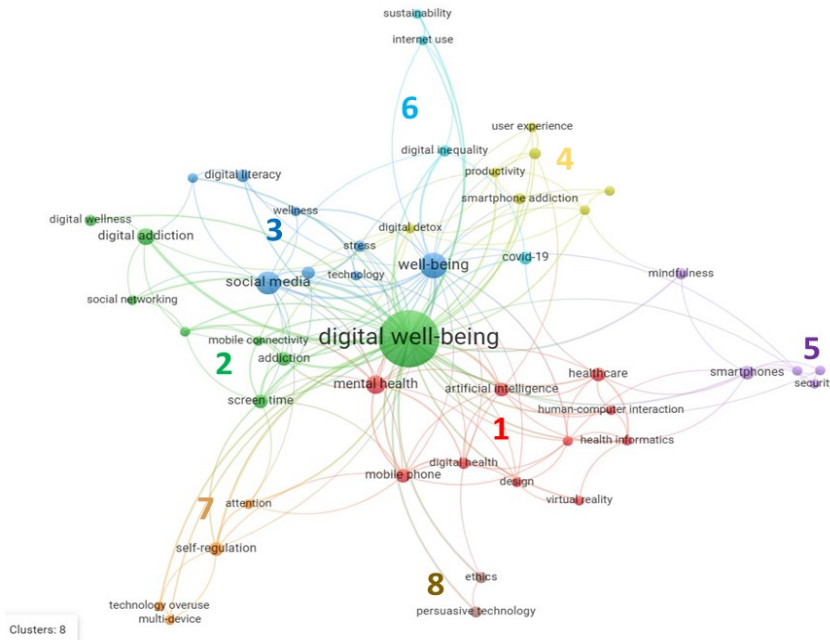


Fig. 3. Author keywords co-occurrence analysis by VOSviewer reveals 8 Clusters **.

1. Red Cluster: Digital health and Assisted living. This cluster includes keywords related to the potential of technology to assist humans in maintaining an active and independent life. Digital health is the application of technology to advance patient care, promote health and well-being of individuals while telehealth or telemedicine enables the remote delivery of health care services [5]. Numerous mHealth apps cultivate users’ health information literacy[6]. Artificial Intelligence (AI) models [7] and wearable technologies [8] can be used to provide ambient assisted living support for patients, elderly people, and frail persons of all ages. AI is a promising technology in the field of mental health, from AI chatbots as “virtual psychotherapists” to social robots, disembodied and embodied artificial agents, for dementia care, autism, even sexual disorders[9]. Another emerging technology is Virtual Reality that could be used to enhance mental health [10] [11].

2. Green Cluster: Digital addiction. The keywords in this cluster are typical of research that adopt “screen time” or “digital addiction” approaches claiming that excessive use of technology can result in a pathological state of addiction, due to ubiquitous connectivity and

[§] https://www.vosviewer.com/documentation/Manual_VOSviewer_1.6.8.pdf

** Interactive version of the map is available online: <https://tinyurl.com/2gr7oerf>

social networking platforms design that can distract users and engage them in harmful behaviors, procrastination, anxiety, and non-productivity [12]. Therefore, researchers suggest that technology offers the potential to help avoid unhealthy habits through monitoring [13], an approach that has led to an expansion of “digital wellbeing” tools aiming to limit technology use [14][15]. Nevertheless, the same keywords have also been used by researchers that take a more critical stance questioning the “digital wellness” tools and this over pathologizing approach[16], and highlight the importance of avoiding a normative top-down perspective on what is considered “excessive” or “too much” for the users [17].

3. Blue Cluster: Social Media and Digital Literacy. The keywords gathered in this cluster are related to problematic social media use [18][19]. The Fear of Missing Out (FoMO) effect is related to our fear of staying offline, in case we miss out on what other users will experience[20]. Technical countermeasures and digital literacy education seems to be the approach to prevent and manage such phenomena [21].

4. Yellow Cluster: User experience and Positive Technologies. The yellow cluster brings together keywords associated with user experience. The design of applications and self-monitoring features to raise user awareness and assist self-control is a main topic of research[22][23][24]. The digital overload reminder tools often generate negative emotions in users such as resentment, shame, anxiety, so positive mindful nudging techniques are proposed to reduce screentime [25]. Positive computing researchers can develop approaches to support the psychological wellbeing of users [26],[27].

5. Purple Cluster: Security and Privacy. This cluster gathers keywords related to privacy management and security issues raised by internet usage and data collection by IoT [28] and assisted living technologies [29]. Ethical considerations are raised concerning the collection, the storage, and the use of digital data pertaining to the users’ behavior (digital phenotype data)[8]. The importance of the users’ ability to take informed decisions is put forward[30] while it is recognized that vulnerable groups, like older people and children, are more likely to experience privacy violations and be more affected by them.

6. Light Blue Cluster: Digital Inequality and Sustainability. The Covid-19 pandemic experience made digital inequalities more visible[31]. In addition, researchers promote designs for more meaningful and moderate digital interactions[32] bearing in mind that the expansion of “data demand” and “online services” of the digital transformation have a negative impact on the environment which is not sustainable for the planet[33].

7. Orange Cluster: Technology Regulation. This consists of two strikingly contrasting aspects. On the one hand, there is the “overuse design” [34] related to the attention economy where users’ attention and data are valuable products[35] and attention-capture dark patterns are adopted to drive users’ behavior and maximize time spent and daily visits[36]. On the other hand, users are assisted to self-regulate the technology overuse by multi-device digital self-control tools[37][38].

8. Brown Cluster: Ethics and Persuasive Technology. Persuasive technology applies behavioral and social psychology theories to change people's attitudes or behaviors. It can be harmful, manipulating towards commercial ends[39] but can also mobilize behavior change and wellbeing [40] [41]. In every case, ethical issues are raised concerning the instrumentalization of user subjectivity and the threat to human agency and autonomy[39].

4 Conclusions

The work presented in this paper aspires to contribute to the DWB literature underlining the ambivalence of discourses concerning the conceptualization of the term “digital well-being”. Though not exhaustive, as it is limited to the Scopus database, it studies an extensive and

indicative list of works that deal with DWB from different scientific fields including Computer science, Social sciences, Medicine, Engineering, Arts and Humanities and Psychology^{††}. What has emerged from the clustering in section 3 is that the term DWB is used as an umbrella term, to include studies that argue that technology presents a positive perspective for humanity, studies that focus on the drawbacks caused by ubiquitous mobile connectivity and studies that attempt to strike a balance, by either appealing to users' autonomy and self-control or urging technology designers to make ethical and sustainable decisions. DWB is associated by many researchers with social media and the time we spend in front of screens, but there is also the trend of theorists evaluating our relationship with technology in a broader way[3]. The digital well-being concept is related to what constitutes a “good life” in the 21st century and the role that emerging technologies can play to enhance human flourishing[42] [43]. We are going through a paradigm shift that is expected to raise some concerns but “technopanic” discourses [44] or applications that “demonize” technology do not contribute to a sustainable perspective in the digital era. Shifting to the digital well-being era, where users, designers, industry, policymakers, and other stakeholders will be most interested in the DWB concept, is a one-way path. To this end, in addition to systematic mapping studies and literature reviews, research towards the conceptualization of DWB needs to be complemented by empirical research involving user participation and this is the subject matter of our future efforts.

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^{††} According to the index of subject areas of Elsevier’s Scopus database.

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