



INTERNATIONAL JOURNAL OF
MODERN EDUCATION
(IJMOE)

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DIGITAL WELL-BEING IN EDUCATION: A THEORETICAL PERSPECTIVE IN BIBLIOMETRIC STUDY

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Article Info:

Article history:

Received date: 07.06.2026

Revised date: 06.07.2026

Accepted date: 30.08.2026

Published date: 15.09.2026

To cite this document:

Moider, N. A., Ariffin, T. F. T., & Nordin, H. (2026). Digital Well-Being in Education: A Theoretical Perspective in Bibliometric Study. *International Journal of Modern Education*, 8(31), 403-418.

Abstract:

This paper aims to examine digital well-being issues among that are anchored by the Job Demands-Resources (JD-R) Theory. The JD-R Theory provides a significant framework for understanding job stress and motivation that comes from digital transformation. However, there are limited sources to discover the application of JD-R Theory in teacher digital well-being research. This study conducts a bibliometric analysis of 564 Scopus-indexed journal articles published between 2000 and 2026 to examine the intellectual structure, thematic evolution, and collaboration patterns in this field. Using Scopus Analyzer, OpenRefine, and VOSviewer, the study analyses publication trends, citation patterns, co-authorship networks, and keyword co-occurrences. The findings indicate a sharp increase in publications after 2019, reflecting the impact of large-scale digitalisation and the COVID-19 pandemic. China, the United States, and the United Kingdom emerged as the leading contributors, while technostress, digital overload, self-efficacy, and work engagement formed the dominant JD-R-related themes. The study concludes that digital well-being research in education has evolved into a theoretically grounded domain that views digital well-being not only as an individual outcome but also as an organisational and work-design issue essential for sustainable digital education reform.

DOI: 10.35631/IJMOE.831025

Keyword:

Bibliometric Analysis; Digital Well-Being; Job Demands-Resources Theory; Vosviewer; Technostress



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Introduction

Digital transformation has fundamentally changed the way education is managed and delivered. Educators and students have experience using online learning platforms, learning management systems, digital communication, artificial intelligence, and various educational applications in the teaching and learning process (Moider et al., 2025a). However, the increased reliance on technology has also created new challenges to the well-being of individuals in educational settings. Continuous connectivity, the variety of digital platforms, prolonged screen exposure, digital overload, technostress, and the blurry of work-life boundaries decrease well-being among teachers (Palm et al., 2025). In this context, digital well-being is increasingly important because the concept goes beyond the question of technology use alone and encompasses the ability of individuals to maintain sustainable balance, autonomy, competence, and functions in a digital environment (Büchi, 2024; Al-Mansoori et al., 2023).

The Job Demands-Resources (JD-R) Theory provides a relevant basis for explaining the relationship. Basically, JD-R highlights work conditions as job demands that require continuous psychological effort, and job resources that help individuals achieve goals, reduce the impact of demands, as well as stimulate growth and motivation (Demerouti & Bakker, 2023; Scholze & Hecker, 2024). In a digital educational environment, this framework allows technology to be seen not as an intrinsically positive or negative factor, but rather as an element that can serve as a resource depending on the conditions of its use. This study seen that there was limited research on mapping of how the digital well-being domain in education is interpreted through JD-R Theory.

Literature Review

Aligned with digital sustainability in the education landscape, bibliometric research related to digital well-being has rapidly developed in recent years. However, the field is still spread variously across many contexts, disciplines and anchored by various theories. Ghai et al. (2023), for example, map the general development of digital well-being research by highlighting the growth of publications, themes, and influential sources. On the other hand, the scope of the study does not focus on the specific educational context (Ghai et al., 2023). Recent studies also show an increased attention to closely related concepts such as digital stress, problematic digital use, digital integrity issues, and technostress. Mohd Bahar et al. (2026) through a scoping review of higher education students, show that digital addiction, unethical internet use and technostress are often studied as separate constructs.

While these studies are important for broadening the understanding of the negative dimensions of technology use, the focus is more on digital experiences or effects in general rather than on how digital demands and digital resources interact in the educational environment. In contrast to previous studies, the current study limits the domain of analysis to the context of education and examines digital well-being as a result formed from the relationship between digital demands, personal resources and organizational resources. This approach is in line with the current study design, which analyzed 564 Scopus-indexed articles to map the intellectual structure, evolution of themes and collaboration patterns in the field of digital well-being education.

At the same time, another group of bibliometric studies focuses more on the digitalization of education, digitalization of education, digital competence and teacher well-being as relatively separate areas. Trinh et al. (2023) map the digital transformation in education, while Ma and Ismail (2025) combine bibliometric analysis with systematic highlights to identify themes related to digital competence, academic achievement, and factors influencing the use of technology. The study by Tran et al. (2024) examined the development of research on teacher well-being. The contribution of these studies is important because they shed light on the ability of individuals to use technology, the development of digital education systems and well-being issues in general. In other words, digital competency studies answer more questions about the ability to use technology effectively, while well-being and technostress studies answer more questions about the psychological effects of technology use.

A more significant difference lies in the use of Job Demands-Resources (JD-R) Theory as an interpretive lens. Study such as Andolšek et al. (2026) have mapped the development in general, while studies related to technostress and employee well-being have shown that high work demands are associated with stress and fading well-being. In contrast, work resources support more sustainable motivation, engagement and functioning. However, the research does not specifically delimit digital well-being in education as a bibliometric domain and interprets its structure through health-impairment and motivational processes. This is the gap that the current study attempts to bridge this conceptual division by analysing both sides of digitalization simultaneously. This is also reflected in the initial findings of your manuscript, when technostress, digital overload and burnout emerge as demand-oriented constructs, while self-efficacy, coping, digital literacy and work engagement function as resource-oriented constructs. Therefore, compared to previous studies that emphasized either digital competence or digital distress separately, this study uses the relationship between demands and resources to explain the conceptual structure of digital well-being in a more balanced scenario.

Research Questions

This bibliometric study is conducted to address the following research questions:

- RQ1. What are the temporal publication trends and growth patterns in research on digital well-being in educational contexts over time?
- RQ2. Who are the most prolific authors contributing to the literature on digital well-being in education, and how is their scholarly productivity distributed?
- RQ3. Which institutions are the leading contributors to digital well-being research in education, as indicated by publication output?
- RQ4. Which countries are the leading contributors to research on digital well-being in education in terms of publication output and citation influence?

RQ5. What are the dominant subject areas contributing to digital well-being research?

RQ6. What are the dominant and emerging research themes in digital well-being research within educational settings, as revealed through keyword co-occurrence analysis?

RQ7. How do international co-authorship networks shape scholarly collaboration in digital well-being research in education across countries?

Methodology

Bibliometrics involves gathering, organizing, and analyzing bibliographic data from scientific publications (Verbeek et al., 2002). Beyond basic statistics, such as identifying publishing journals, publication years, and leading authors, bibliometrics includes more sophisticated techniques like document co-citation analysis. Conducting a successful literature review requires a careful, iterative process to select suitable keywords, search the literature, and perform an in-depth analysis. The bibliometric approach allows researchers to systematically aggregate literature sources and produce more comprehensive and reliable findings (Fahimnia et al., 2015). In this regard, this study focuses on high-impact publications as they provide the theoretical foundations and key developments in the research field. To ensure the accuracy and reliability of the data, the Scopus database was chosen as the primary of the document collection (Al-Khoury et al., 2022). Scopus has a wide coverage of scholarly publications and is often used in bibliometric research. Books, lecture notes, and other types of publications were excluded to maintain the quality of the sources analyzed (Gu et al., 2019). This research use Elsevier's Scopus database covers publications from 2000 to 31 December 2025 for further analysis. In the initial stages, a total of 829 documents were identified. After filtering based on the publication period, the number was reduced to 826 documents. Next, the screening process was carried out based on the type of document and the language of publication. Only select English-language journal articles were retained in the final dataset. After all selection criteria were used, a total of 564 articles were selected for bibliometric analysis.

Data Analysis

Bibliometric analysis is carried out using the VOSviewer software version 1.6.19. This software is widely used to build, map and visualize the structure of knowledge in a research area (van Eck & Waltman, 2007, 2009, 2010, 2017). In line with established bibliometric practice, VOSviewer was employed to examine co-authorship, co-citation, and keyword co-occurrence networks, enabling the identification of structural relationships and thematic patterns within the digital well-being literature.

The full counting method is used in the formation of bibliometric networks. Through this method, each appearance of an author, keyword or country is assigned the same count value. This method allows each element that contributes to the field of study to remain visible in the network mapping. The use of full counting is also suitable for examining thematic patterns and collaborations in emerging research areas. However, a minimum threshold of emergence is set to ensure that the network formed is clearer and more stable. Items that appear too few are excluded as they can create disruptions in cluster formation and make interpretation difficult.

For network construction and visualisation, VOSviewer employed the association strength normalisation method, which adjusts co-occurrence frequencies by accounting for the expected probability of joint occurrence under statistical independence (van Eck & Waltman, 2007). This normalisation technique enhances the accuracy of proximity representations by ensuring that

the distance between items reflects their true relatedness rather than raw frequency alone. Through this procedure, items with stronger conceptual or collaborative relationships are positioned closer together in the resulting maps, facilitating meaningful cluster interpretation. Overall, the combination of full counting, threshold filtering, and association strength normalisation enabled the generation of stable and interpretable bibliometric networks, supporting a rigorous examination of publication trends, thematic structures, and international collaboration patterns in digital well-being research.

Table 1: The Search String

Scopus	TITLE-ABS-KEY (("digital well-being" OR "digital wellbeing" OR "digital well being" OR technostress OR "digital stress" OR "digital overload" OR "digital anxiety") AND (education OR educator* OR teacher* OR academic* OR lecturer* OR "higher education" OR school* OR universit*)) AND PUBYEAR > 1999 AND PUBYEAR < 2027 AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))
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Table 2: The Selection Criterion in Searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Time line	2000 – 2026	< 2000
Literature type	Article	Others

Findings and Discussions

Publication Growth and Trends

The bibliometric analysis of publications on teacher digital well-being integrated with JD-R Theory growth from 2019 – 2025. This reveals significant trends in academic research. Figure 1 provides a detailed quantitative summary of publication trends.

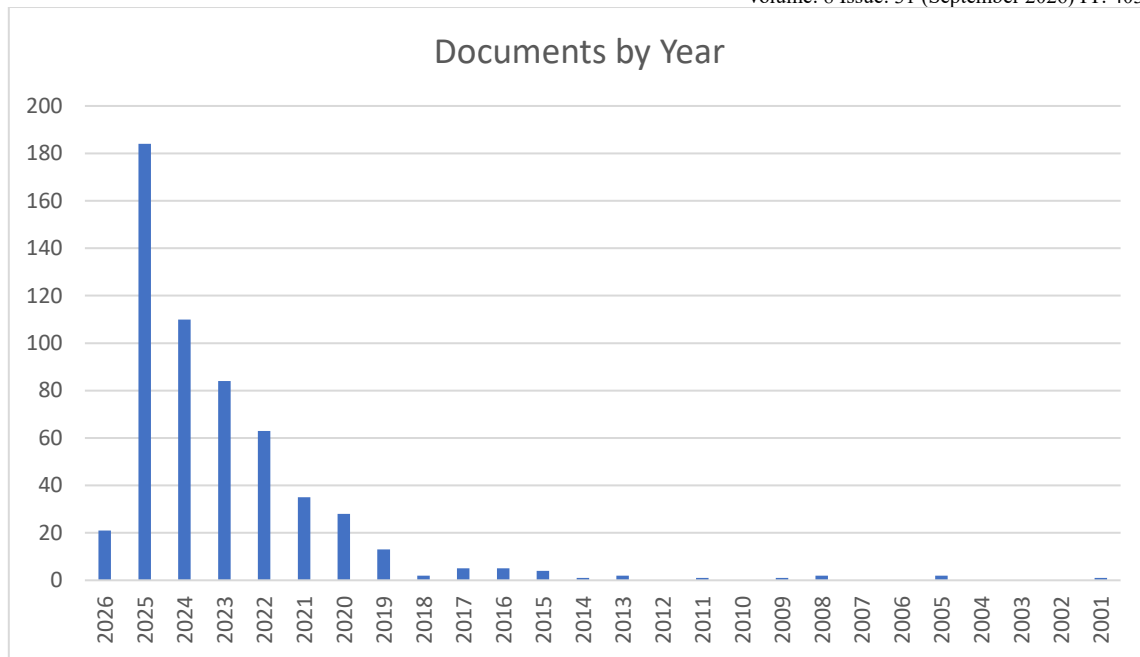


Figure 1: The Trend of Research in Digital Well-Being by Years

1. The year 2000 to 2018:

These years were known as the pre-COVID era. Based on the results, it indicates that there was less research on teacher digital well-being during the pre-COVID era. During this period, the research on teacher digital well-being was in the developing stage and was largely embedded within broader discussions of ICT integration, occupational stress, and general teacher well-being, with limited theoretical anchoring. Digital technologies were not systematically conceptualized either as job demands or job resources, suggesting the stage has low theoretical association.

2. The year 2019 – 2026:

The recent publications from 2019 onwards are known as the post-COVID era, where the technologies sustained growth trends, with publication counts rising from 13 articles in 2019 to 184 articles in 2025 (peak publications). A decline in 2026 due to an incomplete database for the ongoing year. This increment aligns closely with the large-scale digitalisation of teaching and learning activities (Moider et al., 2025b). Within this period, digital technologies became central to instructional delivery, administration, and professional communication. This scenario is pronounced as job demands, and creates such as constant connectivity, digital fatigue, overloaded screen exposure, technostress and burnout (Moider et al., 2025b). Thus, the research of digital well-being and the integration of JD-R theory becomes a system-relevant research framework.

Authorship Analysis

Figure 2 reveals that a highly productive scholarly core within the study of digital well-being. A small number of authors most notably Wang, Q., followed by Wang, X. and Zhao, G. account

for the highest publication outputs, indicating the presence of leading contributors who actively shape the research agenda. However, collaborative engagement dominates the landscape of this research rather than a single author. These results also reveal that the most prolific authors contribute fewer than 10 publications, suggesting that the research of digital well-being with JD-R Theory has not reached a stage of a mature research domain.

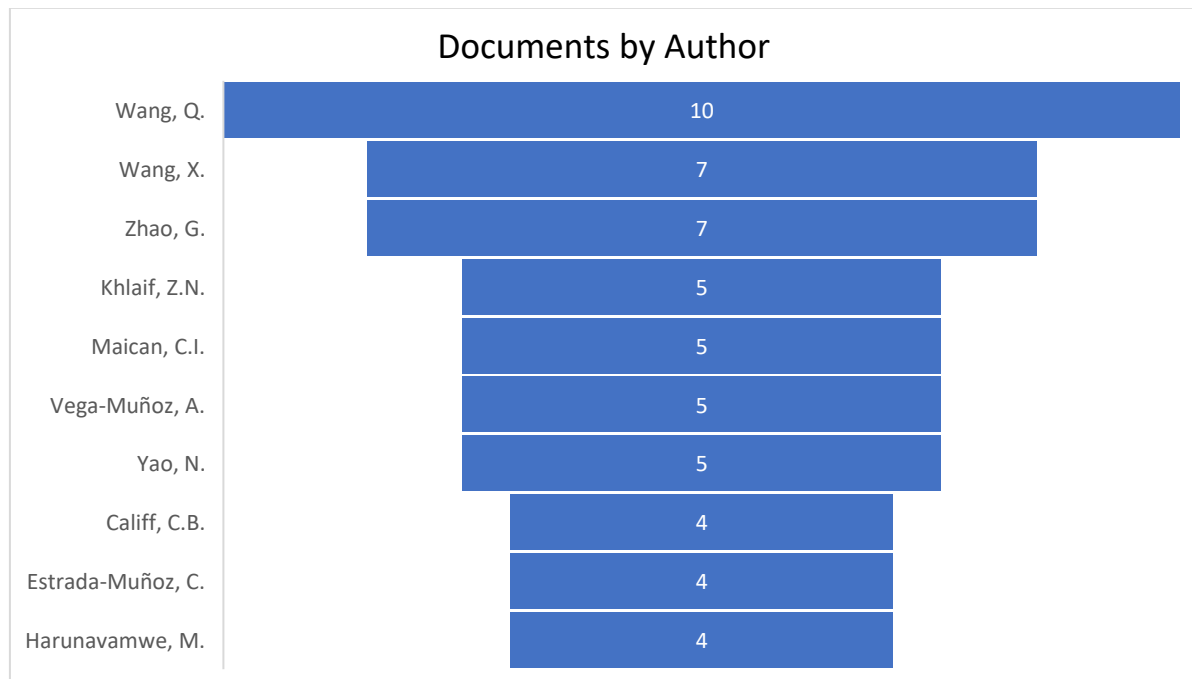


Figure 2: The Trend of Research in Digital Well-Being by the Top Authors

Leading Institutions that Contribute to Digital Well-Being Research in Education

Figure 3 displays the distribution of publications by affiliation indicates that research on teacher digital well-being is institutionally concentrated within a limited number of research-intensive universities, particularly in Asia. Beijing Normal University was identified as the most prolific institution in publications related to this field. The ranking was followed by Shaoyang University, Qingdao University and Central China Normal University. This pattern shows the dominance of Chinese institutions in research related to digital well-being. The dominance of teacher education-oriented universities is also an important finding. This situation shows that the issue of digital well-being is getting more attention in institutions that are directly involved with teacher training and development.

The pattern also reflects the close relationship between digital well-being and the fields of teacher education, educational psychology and applied education research. Therefore, the development of research in this field is not only driven by technology-based or medical institutions that have a specific mandate in the professional development of teachers.

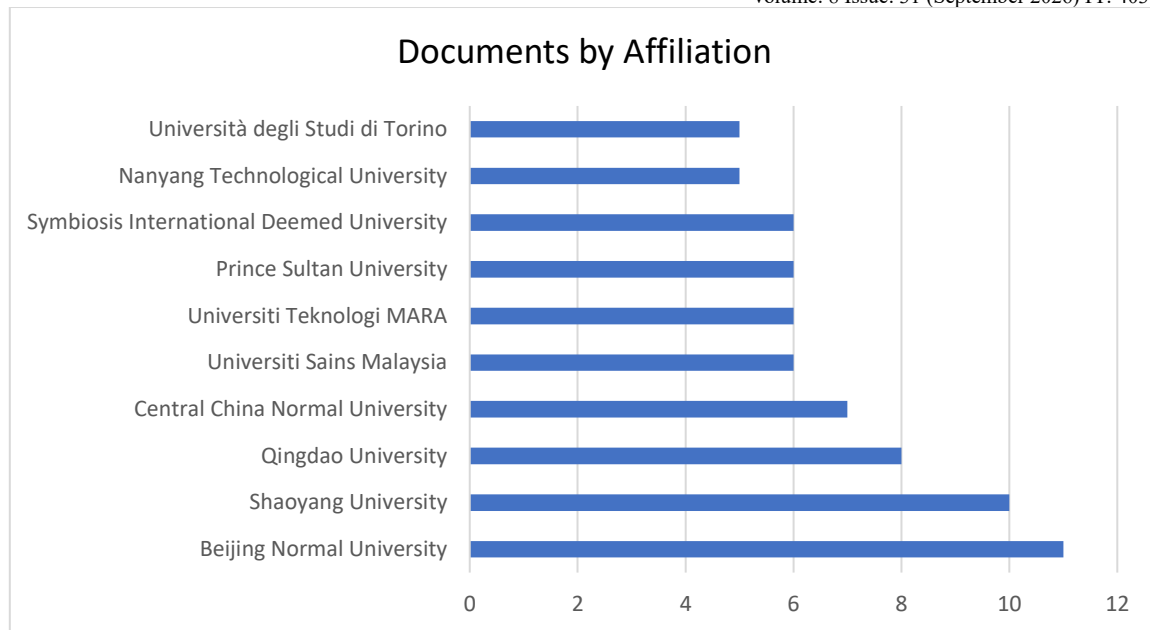


Figure 3: The Distribution of Institutions in Digital Well-Being Research

The Countries that are Leading on Digital Well-Being in Education

Figure 4 reveals that the top 10 countries show a strong geographical concentration of research on digital well-being with JD-R Theory. China emerges as the most prolific contributor with 90 publications. It is followed by the United States (53 publications), India (41 publications) and the United Kingdom (41 publications). From these results, it reflects that the varying pace of digital transformation and the awareness of doing research in the digital well-being area. In other words, China, US, India and UK have intensified teachers' digital work demands, compared to other countries. Thus, JD-R Theory was implemented in the research of digital well-being.

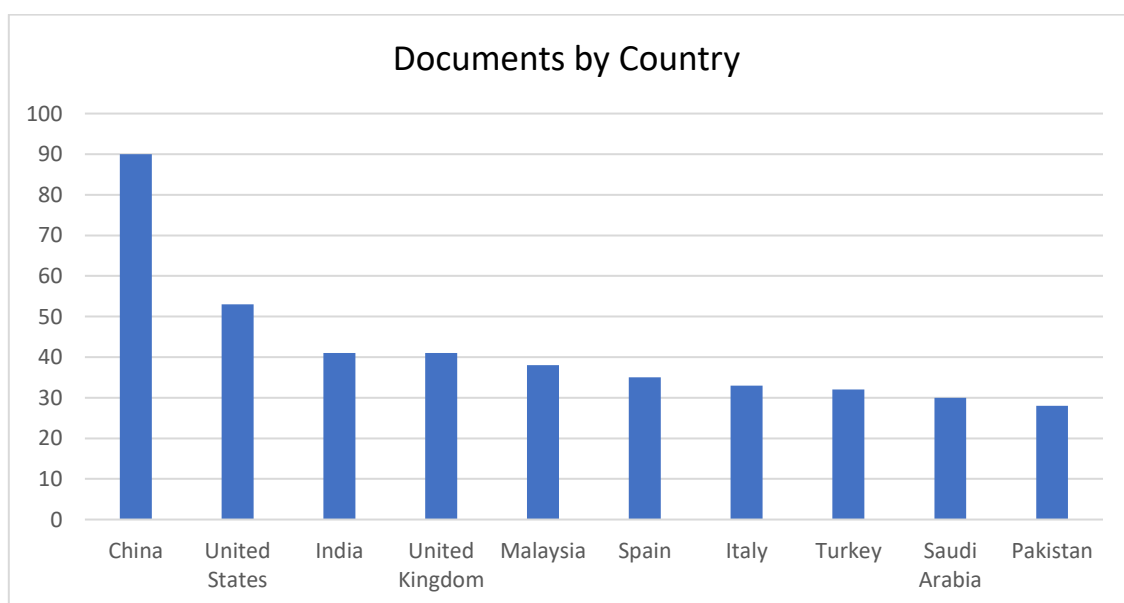


Figure 4: The Distribution of Digital Well-Being Research by Country

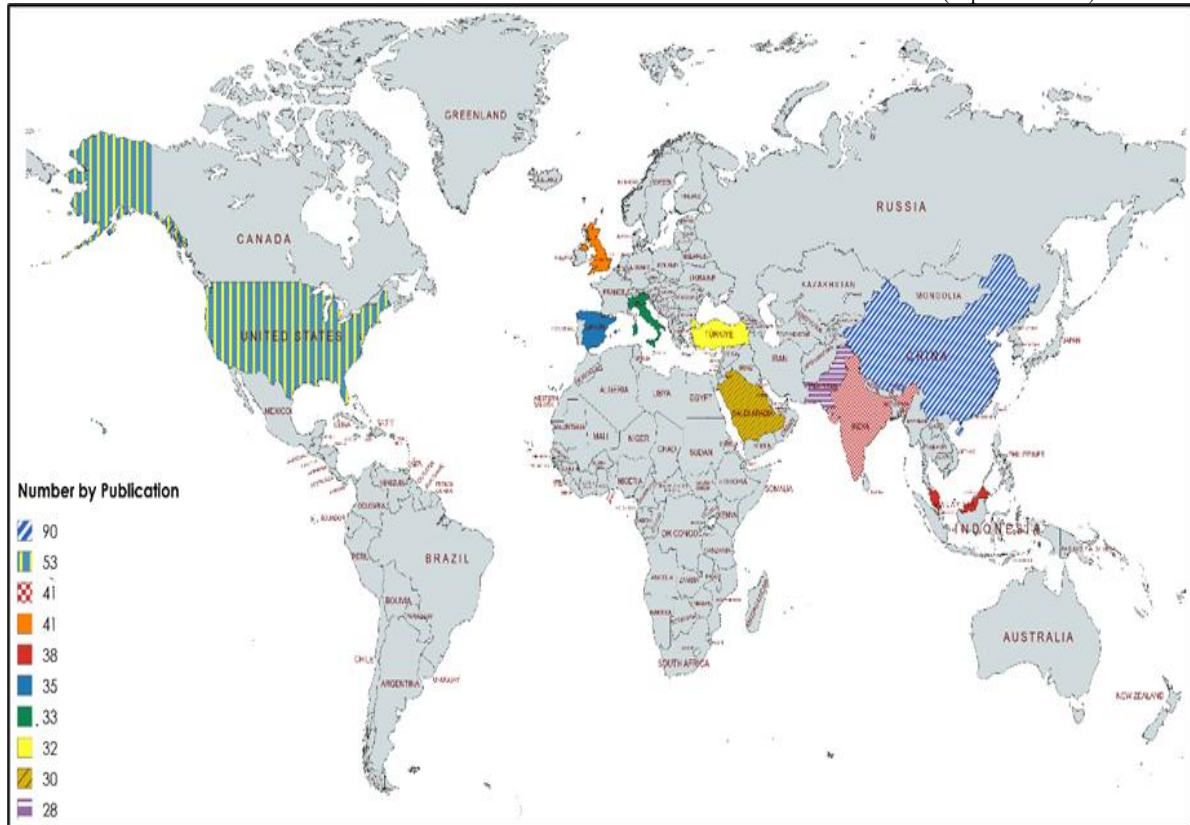


Figure 5: The Distribution of Publications by Country

The Dominant Subject Areas Contributing to Digital Well-Being Research

The pie chart in Figure 6 shows the distribution of publications by subject area demonstrates that research on teacher digital well-being is inherently multidisciplinary, with a strong anchoring in the Social Sciences, which account for the largest share of publications (31.0%). The dominance of the field of education in this study shows that teachers' digital well-being that applies JD-R Theory is largely associated with educational practices, work environment, policies and organizational dynamics. At the same time, contributions from the fields of Computer Science (14.1%) and Psychology (13.0%) show that digital well-being is formed through a combination of technological and psychological factors.

Computer Science studies usually pay attention to the use of digital platforms, technology systems and the consumption environment. On the other hand, studies in the field of Psychology focus more on aspects such as stress, burnout, motivation and emotional regulation. These two fields complement each other in explaining the experience of teachers when faced with an increasingly digital-intensive work environment.

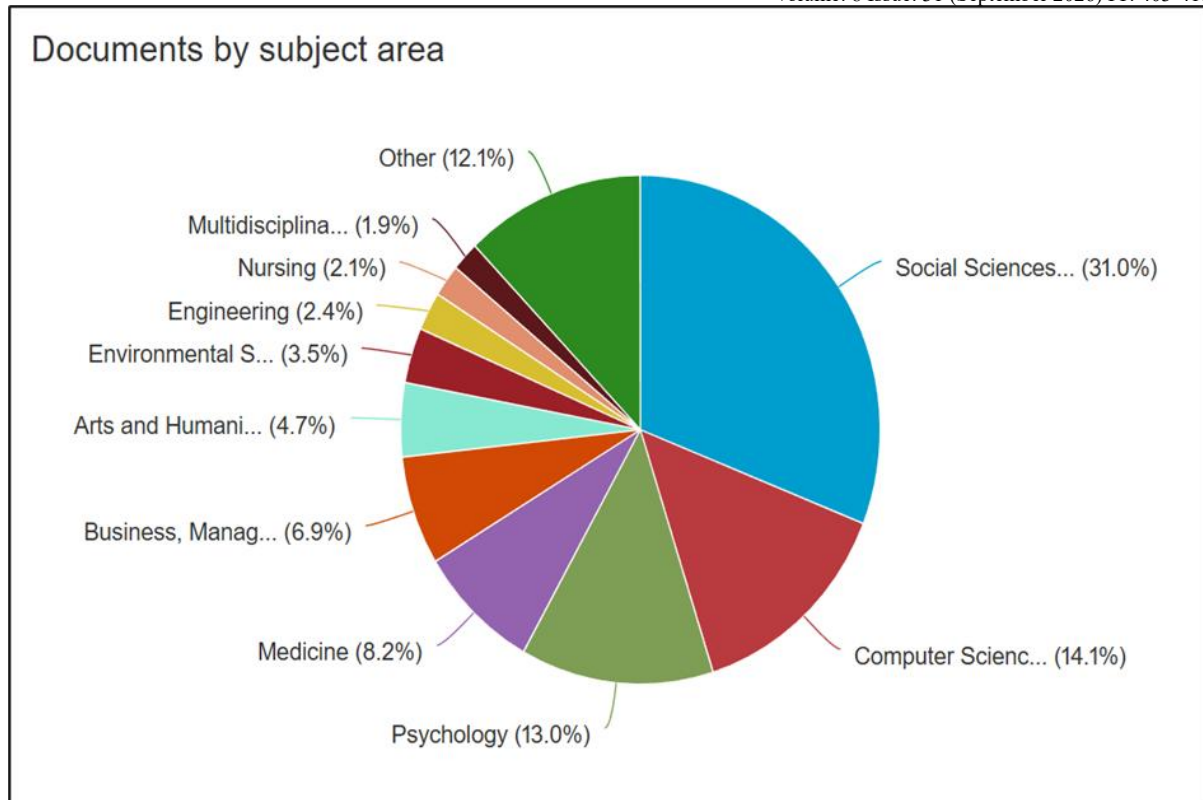


Figure 6: The Dominant Subject Areas Contributing to Digital Well-Being Research

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Computer Science-based studies usually pay attention to the use of digital platforms, technology systems and the consumption environment. On the other hand, studies in the field of Psychology focus more on aspects such as stress, burnout, motivation and emotional regulation that are related to JD-R Theory. These two fields complement each other in explaining the experience of teachers when faced with an increasingly digital-intensive work environment.

The Dominant Research Themes in Digital Well-Being Studies Based on Keyword Co-Occurrence Analysis

Based on the analysis of the co-occurrence of keywords, Figure 7 illustrates the conceptual structure in the field of digital well-being research. This analysis assesses the frequency with which two or more keywords appear simultaneously in the same publication. The repeated occurrence shows that the concept has a close intellectual relationship and is often discussed in the same research context.

In the VOSviewer network visualization, each node indicates how often those keywords are used in the entire dataset. Meanwhile, the connecting lines between the nodes describe the co-

occurrence relationship between keywords. The strength of the relationship between keywords is also shown through the total value of link strength. Higher values indicate a stronger relationship between a keyword and another keyword in the network.

Therefore, the analysis of the co-occurrence of keywords is not just about identifying topics that are frequently studied. This analysis also reveals how a concept is interrelated and forms a specific cluster of themes in the literature. Through the mapping, the main focus of research as well as the conceptual patterns underlying the development of the field of digital well-being can be identified more clearly.

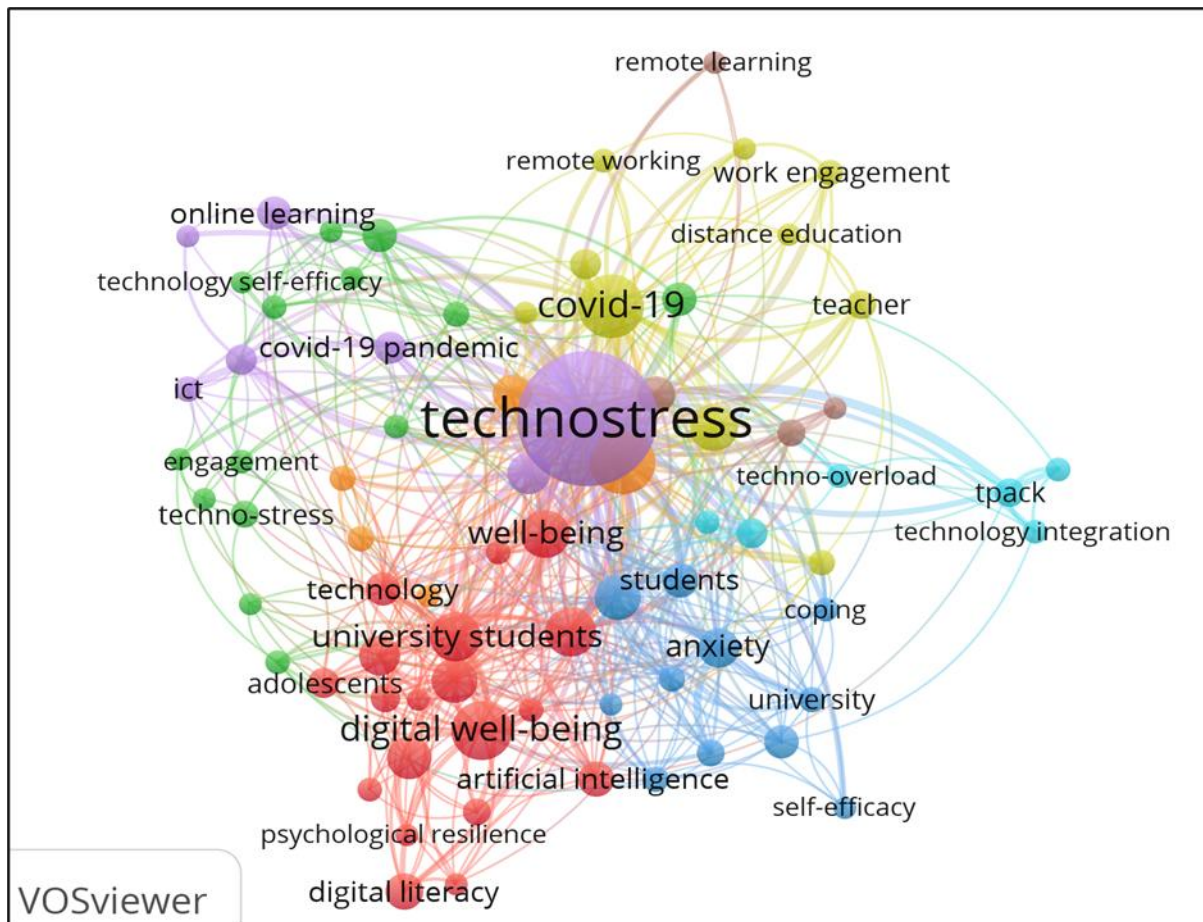


Figure 7: Network Visualisation Map of Co-Occurrence by Keywords

The map in Figure 7 is developed using the full counting method in VOSviewer. This method retains the full contribution of each keyword in the formation of co-occurrence relationship. The approach is suitable for conceptual mapping as the relationships between concepts can be comprehensively displayed in a bibliometric network (van Eck & Waltman, 2010). To ensure that the resulting network is clearer and more meaningful, a minimum threshold is set at five occurrences. This means that only keywords that are included in the analysis. This threshold setting helps to reduce keywords that are too rarely used and have the potential to result in an unstable or difficult-to-interpret network.

The mapping results reveal that technostress is in a prominent position and has a strong relationship with several key concepts. Among them are digital well-being, anxiety, coping,

self-efficacy and network engagement. The relationship is also seen with pandemic-related terms such as COVID-19 and remote learning. Overall, the keyword structure shows that digital well-being is evolving as a field that connects technological demands with psychological and professional resources. This pattern has a conceptual fit with the JD-R framework. The findings also open up space for research related to more sustainable digital work design in the teaching profession.

The International Co-Authorship Networks from Scholarly Collaboration in Cross-Border Research.

Figure 8 reveals the analysis of country co-authorship using VOSviewer. This Analysis is used to identify patterns of international collaboration based on publications co-produced by researchers from different countries to be systematically mapped (van Eck & Waltman, 2009, 2010). In the visualization, each node represents a country, while the size of the node represents the number of publications produced. The lines between the nodes show the collaborative relationship based on the joint publications. Meanwhile, the total link strength shows the overall strength of a country's relationship with other countries in the network. Therefore, countries with a high total link strength value are not only active in terms of publications but also have stronger international collaboration networks. This analysis helps to identify countries that act as knowledge production centers, links between networks and countries that are still in peripheral positions.

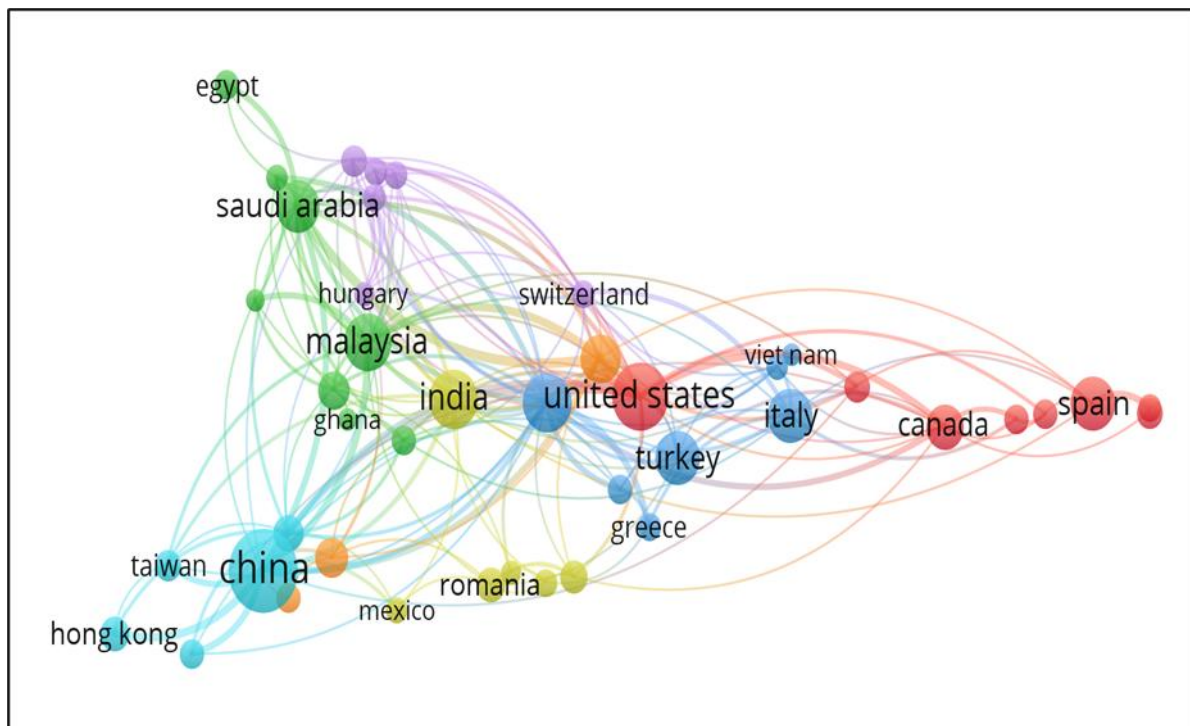


Figure 8: Network Visualisation of Co-Authorship by Countries

The collaboration map is developed using the full counting method. Through this method, publications involving several countries give credit to each country involved in collaboration. This approach allows international collaborative relationships to be clearly maintained in the network (van Eck & Waltman, 2010). Of the 114 countries identified in the initial dataset, 63

countries met the minimum requirement at least five documents and were included in the analysis. The five-document threshold was used to reduce the influence of countries that only had isolated or inconsistent publication. This step resulted in a clearer and easier-to-interpret network structure.

The results of the analysis show that the United States, China, India and Malaysia, along with several European countries, are in an important position in the collaborative network. These countries have broader links with international research partners and serve as centres for the production and exchange of knowledge in the field of digital well-being and JD-R Theory. The existence of a network that spans Asia, Europe, and North America shows that digital well-being is not an issue limited to one specific region. Rather, the issue has evolved as a research agenda involving various educational systems and teacher employment contexts.

Cross-country collaborations also provide an opportunity to compare teachers' experiences in different education systems. Such collaborations can broaden the understanding of how digital demands and resources are influenced by organizational, cultural and policy factors in education (Weber et al., 2024). Overall, the international network of co-authors reveals that digital well-being with JD-R Theory embedded research is growing through cross-country and regional collaborations. This pattern supports knowledge exchange, comparisons between contexts, as well as the development of a more holistic perspective on teacher well-being and JD-R Theory in a digital work environment.

Conclusion

This study provides a comprehensive bibliometric account of how digital well-being research in education has developed from a relatively fragmented area into a rapidly expanding and multidisciplinary field. The sharp growth in publications after 2019 indicates that digital well-being is no longer a peripheral concern associated only with technology use. Instead, it has become increasingly relevant to how educators experience, manage, and sustain their work within digitally intensive educational environments. The continuous growth of the literature beyond the immediate COVID-19 period further suggests that this concern is becoming embedded within the broader agenda of digital transformation in education.

More importantly, the intellectual structure of the field reveals a meaningful shift in how digital well-being is understood. Digital well-being issues are understood in terms of how digital demands interact with personal and organizational resources available to educators. This pattern is conceptually consistent with the Job Demands-Resources perspective, which explains well-being through the dynamic relationship between demands that consume energy and resources that support coping, motivation, and engagement.

This study also demonstrates that digital well-being has become a multidisciplinary and internationally shared research concern. This can be revealed based on the contributions from various dominant subject areas in digital well-being with JD-R Theory research. At the same time, expanding collaboration across the global countries indicates that this field as a contextual and systemic phenomenon rather than a universal outcome of technology use.

Future studies should move beyond identifying the negative consequences of digitalization towards examining how sustainable digital work can be designed. In other words, future studies

should therefore investigate combinations of digital well-being and JD-R theory in measuring other relationships of antecedent constructs.

Limitation

This study has several limitations that should be acknowledged. First, the analysis relied solely on the Scopus database, which may exclude relevant publications indexed elsewhere.

Acknowledgements: The authors would like to express their appreciation to Universiti Utara Malaysia and Institut Pendidikan Guru Malaysia for the academic support provided throughout the conduct of this study.

Funding Statement: This paper is part of the first author's doctoral-level study, which is funded by the Sponsorship Department, Ministry of Education, Malaysia, under the Federal Training Grant, KPM.BT.700-30/22(5).

Conflict of Interest Statement: The authors declare that there is no conflict of interest regarding the publication of this article.

Ethics Statement: This study employed bibliometric data obtained from the Scopus database and did not involve human participants, animals, personal data, or any form of intervention. Therefore, ethical approval and informed consent were not required

Author Contribution Statement: This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : Conceptualization
M : Methodology
So: Software
Va: Validation
Fo: Formal analysis

I : Investigation
R : Resources
D : Data Curation
O : Writing - Original Draft
E : Writing - Review & Editing

Vi : Visualization
Su: Supervision
P : Project administration
Fu: Funding acquisition

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