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Digital Well-being in relation to Environmental Concerns: A Study on Prospective Teacher Educators from the Himalayan Region

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Abstract: The term "digital well-being" is employed to describe the influence of technology and digital services on individuals' mental, physical, social, and emotional health. Despite frequent engagement with technology, there is a general neglect of this critical aspect of health, which pertains to maintaining a healthy relationship with technological tools. Digital well-being encompasses opportunities for the exchange of ideas and resources that enhance human relations with technology. The pervasive digitalization across all sectors of life necessitates a focus on digital well-being. In discussions concerning digital platforms, it is evident that they play a significant role in advancing environmental conditions. The advent of digital facilities, including geographic information systems, satellite data transmission, and related technologies, has amplified the impact of environmental factors, thereby improving the quality of life. However, rapid digitalization also influences the natural environment, altering our modes of interaction, understanding, and observation of the natural world. This research aims to analyze the digital well-being of prospective teacher educators from Himalayan regions in relation to their environmental concerns. A mixed-method approach was employed to achieve the research objectives, utilizing a self-constructed 'Digital Well-being Scale' and an 'Environmental Concern Scale." Furthermore, an open-ended environmental concern questionnaire was administered to gather insights from prospective teacher educators. The study reveals a strong correlation between their digital well-being and environmental concerns.

Keywords: Digital Well-being • Environmental Issues • Prospective Teacher Educators • Himalayan Region.

Introduction

In today's digital age, technology has become an integral part of our daily lives. Devices such as smartphones, laptops, smartwatches, and tablets provide us with constant access to information, communication, and entertainment, making our lives more efficient and convenient. However, this pervasive use of technology is not without consequences. Many individuals experience negative side effects from excessive technology use, including eye strain, fatigue, irritability, emotional disturbances, back and shoulder pain, and other physical and mental health issues. The impact of technology on our lives ultimately depends on how mindfully and purposefully we use it.

The COVID-19 pandemic further accelerated our reliance on digital technologies. As people transitioned to remote work, online education, and virtual socialization, screen time significantly increased (Pandya & Lodha 2021; Trott et al 2022; Moitra & Madan 2022). While technology undoubtedly supported continuity in education, employment, and communication during this global crisis, it also led to increased dependence, raising concerns about digital well-being.

Technology, as a product of scientific progress, has undoubtedly simplified human life and enhanced development across various sectors. It continues to play a crucial role in improving human welfare. However, the growing dependency on technology in both

professional and personal domains calls for a balanced approach. In this context, the concept of *digital well-being* has emerged to promote the sustainable use of technology. It emphasizes mindful interaction with digital tools to minimize harmful impacts on physical and mental health.

According to Burr et al (2020), digital well-being involves understanding how technologies like smartphones, social media, and artificial intelligence affect our lives and our sense of what constitutes a healthy, fulfilling existence in an increasingly digital society. Vanden and Mariek (2021) define digital well-being as the optimal state of physical and mental health achievable while using technology. In essence, just as general well-being involves daily healthy habits, digital well-being focuses on cultivating healthy digital behaviors to foster a positive relationship with technology in both personal and professional contexts.

Sas (2019) argues that digital well-being can be achieved through a mindful and intentional approach to technology use. This includes using digital devices in ways that enhance, rather than hinder, our well-being. Being digitally well means being thoughtful, purposeful, and aware of how, when, and why we engage with technology. Importantly, users need the right skills and knowledge to use digital technologies effectively and responsibly. In today's digitally driven world, digital well-being is essential to ensuring overall human wellness.

Another important dimension to consider is the environmental impact of digital technology. As the usage of digital devices continues to grow, so does their ecological footprint. The production and disposal of electronic devices contribute significantly to environmental pollution. Manufacturing electronics requires substantial energy and raw materials, leading to environmental degradation. When discarded, these devices often end up as electronic waste (e-waste), posing a serious threat to ecosystems if not properly managed.

The environmental impact doesn't stop at the physical devices. The operation of digital services—such as video streaming, data storage, and cloud computing—requires large-scale data centers that consume immense amounts of electricity. The increasing demand for these services further exacerbates the environmental burden. Therefore, it is crucial to adopt mindful practices that reduce our digital footprint, such as limiting screen time, recycling old electronics, and supporting eco-conscious companies.

Being aware of the environmental implications of our digital habits can lead to more responsible behavior. Understanding that digital consumption contributes to pollution encourages individuals to choose energy-efficient devices, reduce unnecessary screen time, and recycle technology. This kind of mindfulness not only supports personal well-being but also protects the environment.

Globally, environmental issues such as climate change, extreme weather, and biodiversity loss are becoming more urgent. According to a recent World Economic Forum report, five of the top ten global risks are environmental. The overuse of digital technologies has become a major contributor to these problems. As Visual Capitalist reports, every minute sees the streaming of over 400,000 hours of Netflix content, the uploading of 500 hours of video to YouTube, and the exchange of nearly 42 million WhatsApp messages. Meanwhile, Statista notes that China, the United States, and India are leading generators of e-waste.

These statistics underscore the pressing need to investigate the overconsumption of digital resources and their environmental consequences. In the field of education, where digital technologies are increasingly prevalent, it becomes important to understand whether

teachers and students are aware of these implications.

This study focuses on prospective teacher educators, examining their levels of digital well-being and their awareness of environmental concerns related to technology use. While digital tools are widely employed in educational settings, there remains a gap in research concerning the intersection of digital well-being and environmental responsibility among future educators. By exploring how these individuals perceive and manage their use of technology in relation to environmental issues, the study aims to highlight the importance of integrating digital well-being and sustainability awareness into teacher education programs.

Objectives

This study primarily focuses on examining the levels of digital well-being and environmental concerns among prospective teacher educators, comparing these aspects based on gender and academic stream. Additionally, it aims to understand the relationship between digital well-being and environmental concerns of prospective teacher educators. Null hypotheses were formulated to compare digital well-being and environmental concerns among prospective teacher educators.

Research Methodology

A mixed research method (qualitative and quantitative) was employed for the study. To know the digital well-being and environmental concern among prospective teacher educators, a descriptive survey method was adopted, and to know the views of prospective teacher educators towards environmental issues, a thematic analysis was conducted. The target population consisted of all prospective teacher educators enrolled in the M.Ed. Training Program at Birla Campus, HNB Garhwal University, Srinagar. A purposive sample of 60 prospective teacher educators was selected from the Birla Campus, HNBGU Srinagar (Garhwal). To assess digital well-being and environmental concerns among prospective teacher educators, two self-constructed tools were utilized. The first tool, the "Digital Well-Being Scale," was developed with a 10-point rating system, where a score of 1 represents the minimum and a score of 10 represents the maximum for individual statements. This scale comprised 38 items related to digital well-being and had a reliability coefficient of .82, as measured by Cronbach's alpha. The second tool was the "Environmental Concerns Scale," which included 18 items about environmental issues, also rated on a 10-point scale. Similar to the first scale, a score of 1 represents the minimum and 10 the maximum for individual statements. This scale had a reliability coefficient of .60, evaluated through Cronbach's alpha. Additionally, an open-ended questionnaire was also framed to gather qualitative data regarding the effects of digital technology use on the environment from prospective teacher educators. The scales were administered to the prospective teacher educators online using Google Forms. The scores for environmental concerns ranged from 18 to 180, while scores for digital well-being ranged from 38 to 380. To categorize the digital well-being and environmental concerns of the prospective teacher educators, the raw scores were organized into five distinct categories based on the 'equal interval method.' For this, the minimum score of the raw data was subtracted from the maximum score, and the gained score was divided into five equal interval groups, namely poor, low, average, adequate, and high. The classification of scores for both the digital well-being and environmental concern scales was established based on this range score.

Table 1: Categorisation of the Levels of Digital Well-being

Sr. NO.	Score Range	Levels of Digital Well-being
1	38-106	Poor
2	107-175	Low
3	176-243	Average
4	244-311	Adequate
5	312-380	High

Table 2: Categorisation of Levels of Environmental Concerns

Sr. NO.	Score Range	Levels of Digital Well-being
1	18-49	Poor
2	50-81	Low
3	82-113	Average
4	114-145	Adequate
5	146-180	High

Result and Discussion

Analysis of Quantitative Data

Table 3: Distribution of the Prospective Teacher Educators' Levels of Digital Well-being

Gender	N	Level of Digital Well-being				
		Poor	Low	Average	Adequate	High
Prospective Teacher Educators	60	0	3	39	15	3
	%	0%	5%	65%	25%	5%

Table 3 depicts the distribution of prospective teacher educators in Poor, Low, Average, Adequate, and High levels on the basis of scores obtained by them on the Digital Well-being scale. The total number of prospective teacher educators was 60 out of which, no responded were found at the poor level, 3(5%) were observe at the low level, 39 (65%) were found at the average level, 15 (25%) were observed at the adequate level and minimum 3 (5%) were found at the high level of digital well-being. The result indicates that the maximum number of prospective teacher educators have an average level of digital well-being, followed by the adequate, high, and low levels, and no responses were obtained at the poor level (Fig.1).

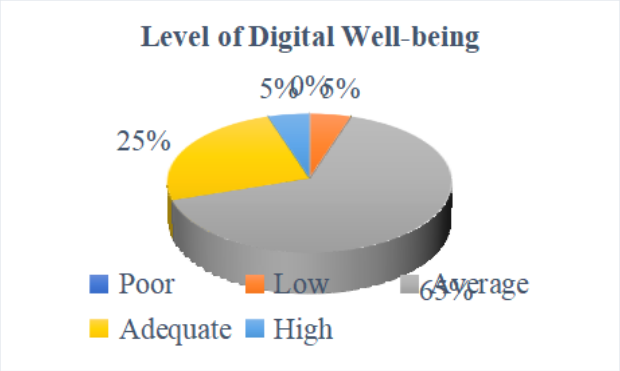

Fig. 1: Percentage of Prospective Teacher Educators' Levels of Digital Well-being

Table 4: Distribution of the Prospective Teacher Educators' Levels of Environmental Concerns

Gender	N	Level of Environmental Concerns				
		Poor	Low	Average	Adequate	High
Prospective Teacher Educators	60	0	4	43	13	0
	%	0%	6.66%	71.66%	21.66%	0%

Table 4 presents the classification of prospective teacher educators on the basis of their level of environmental concerns as poor, low, average, adequate, and high levels. Out of total 60 prospective teacher educators, the maximum number 43 (71.66%) were found at the average level followed by 13 (21.66%) at the adequate level, and 4 (6.66%) at the low level, while no responded were found at the poor and high level (Fig. 2).

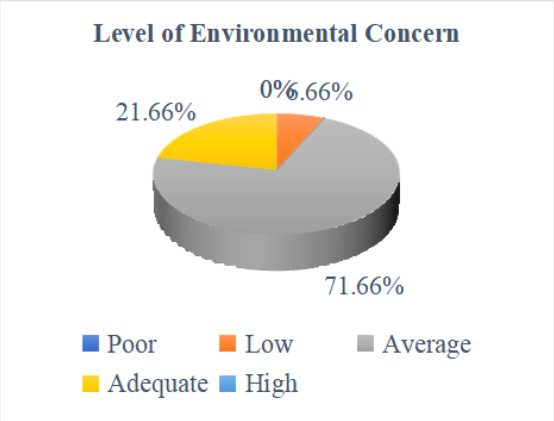

Fig. 2. Percentage of Prospective Teacher Educators' levels of Environmental Concerns

Table 5: Comparison of the Digital Well-being of Male and Female Prospective Teacher Educators

Subject stream	N	Mean	Std. Deviation	t	p	Status
Male	19	233.84	44.600	0.071	0.944	Insignificant at the .05 level
Female	41	234.56	32.178			

Table 5 reveals that the t-ratio between male and female prospective teacher educators towards digital well-being was calculated to be 0.071, which is not significant at the 0.05 level of significance. There was no significant difference found between male prospective teacher educators and female prospective teacher educators. However, statistically, it was found to be insignificant. Therefore, male and female prospective teacher educators have the same level of digital well-being.

Table 6: Comparison of the Digital Well-being of Prospective Teacher Educators on the basis of Subject Streams

Subject stream	N	Mean	Std. Deviation	t	p	Status
Art	30	224.433	35.009	2.19	0.033	Significant at the .05 level
Science	30	244.233	35.1369			

Table 6 depicts that the t-ratio between art and science streams' prospective teacher educators towards digital well-being was calculated to be 2.19, which is significant at the 0.05 level of significance. Thus, it calculated that the mean score of prospective teacher educators from

the science stream (M= 244.233, & SD= 35.1369) was found to be higher than prospective teacher educators from the art stream (M= 224.433, & SD= 35.009). Therefore, prospective teacher educators from the science stream were found to have higher digital well-being than prospective teacher educators from the art stream.

Fig. 3: Mean scores of Prospective Teacher Educators from Art and Science Streams

Table 7: Comparison of the Environmental Concerns of Male and Female Prospective Teacher Educators

Gender	N	Mean	Std. Deviation	t	p	Status
Male	45	103.7	16.879	0.62	0.538	Insignificant at the 0.05 level
Female	15	106.7	15.102			

Table 7 calculates the t-ratio between the Mean scores of environmental concerns of male and female prospective teacher educators was found to be 0.62, and is not significant at the 0.05 level of significance. Therefore, it is clear that there is no significant difference between the mean scores of environmental concerns of male (M=103.7 & SD=16.879) and female (M=106.7 & SD=15.102) prospective teacher educators. The male and female prospective teacher educators were found to be equally concerned about environmental concerns. Therefore, both male and female prospective teacher educators are equally aware of environmental awareness. The findings of Kapri (2017) support the result of this study.

Table 8: Comparison of the Environmental Concerns of Art and Science Prospective Teacher Educators

Stream	N	Mean	Std. Deviation	t	p	Status
Art	30	99.80	16.26	2.28	0.027	Significant at 0.05 level
Science	30	109.1	15.39			

Table 8 depicts the environmental concerns of prospective teacher educators from the Arts and Science streams. The mean and SD for arts and science prospective teacher educators were obtained as 99.80, 16.26, and 109.10, 15.39, respectively. The calculated t value was found to be 2.28, and the p value was 0.027. Therefore, the hypothesis formulated was rejected at a 0.05 level of significance. It showed that there is a significant difference in the environmental concerns of art and science stream prospective teacher educators. Prospective teacher educators from the Science stream possessed better environmental concerns than those from the Arts stream (Fig. 4).

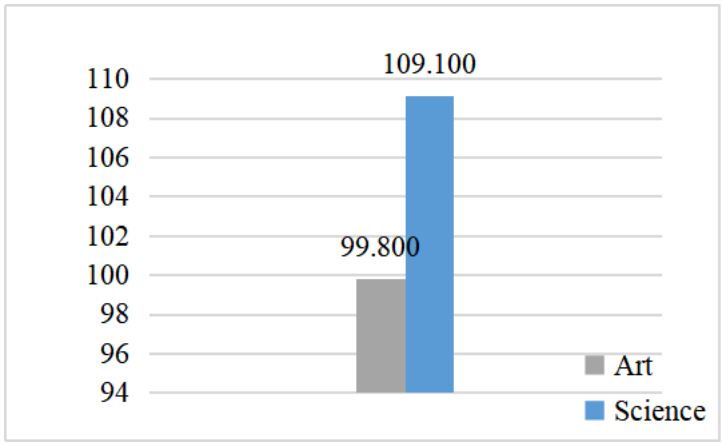

Fig. 4: Mean score of Prospective Teacher Educators from Art and Science Streams

Table 9: Correlation between Digital Well-Being and Environmental Concerns among Prospective Teacher Educators

Variable	N	Mean	S.D.	Pearson Product-Moment Correlation(r)	Remark
Digital Well-being	60	246.383	46.4437	**0.600**	Strong and positive correlation
Environmental Concerns	60	82.30	15.786		

Table 9 shows that the mean value for digital well-being was found to be 246.38 out of 380, and that of environmental concern was obtained to be 82.30 out of 180. The correlation coefficient computed between digital well-being and environmental concerns was 0.60. The result indicates a "strong" positive and statistically significant correlation between the digital well-being and environmental concern of prospective teacher educators (Fig.5). This suggests a strong relation between the digital well-being and environmental concerns among prospective teacher educators. These findings imply that as the level of digital well-being of prospective teacher educators increases, their level of environmental concern also increases.

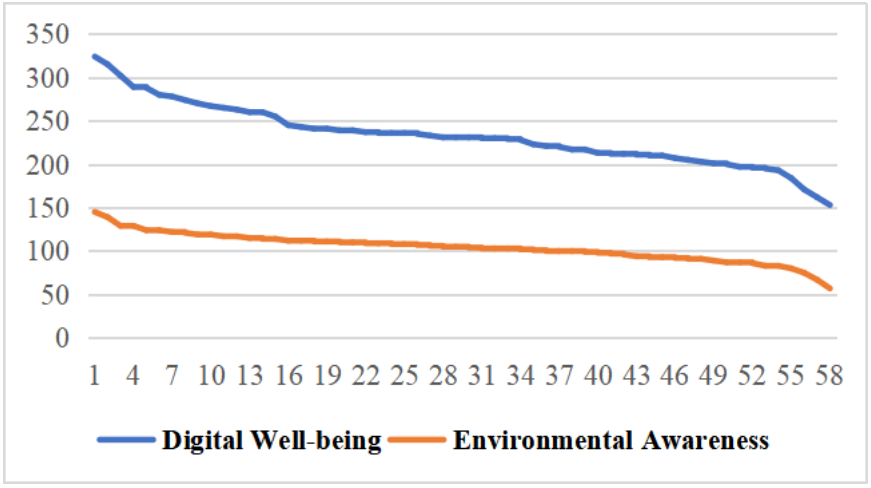

Fig.5: Correlation between Digital Well-Being & Environmental Concerns of Prospective Teacher Educators

Analysis of Qualitative Data

Table 10: Thematic analysis of the prospective teacher educators' awareness of environmental concerns and their levels of digital well-being

Levels of Digital Well-being (Score Range)	Range of Score	Theme	Sub-Themes
38–106	Poor	**No Response**	**No Response**
107–175	Low	**Partial Awareness**	Promotion of solar systems (general idea without context), Unclear or limited knowledge of radiation and environmental impact, Concern about forest fires Little concerns for birds and animals
176–243	Average	**Emerging Environmental Awareness**	Concerns over 5G radiation and the extinction of bird species Focused on deforestation and global warming Initial understanding of waste management Knowledge about health impacts (e.g., cancer, heart disease) Know the negative effects on small insects and animals
244–311	Adequate	**Environmentally Informed and Action-Oriented**	Advocacy for wired internet, solar panels Knowledge of climate change, deforestation, and forest fires Emphasis on gray-water recycling and the 3R formula Recognition of mental and physical health impacts Concern for environmental imbalance due to 5G
312–380	High	**Conflicting Understanding of Sustainable Practices**	Denial of 5G effects despite other environmental concerns Acknowledgement of radiation and climate change Emphasis on reuse and sustainability (e.g., solar panels, reuse of gadgets)

Table 10 illustrates the insightful relationship between levels of digital well-being and awareness of environmental concerns among prospective teacher educators. This table reveals prospective teacher educators' understanding of the impact of technology use on the environment, as reflected in their digital well-being scores.

At the poor level of digital well-being, no responses were recorded. At the low level of digital well-being, prospective teacher educators show a fragmented or unclear understanding of environmental issues. They mentioned concerns like "promote solar system" and "radiation effects on birds," but without depth or clarity. Although there are mentions of forest fires and birds' safety issues related to environmental concerns, they did not describe any other specific environmental issues.

Further, at the average level of digital well-being, prospective teacher educators began to exhibit conscious environmental concern, expressing specific worries about 5G radiation, species extinction, deforestation, global warming, and even health issues like cancer. Additionally, they mentioned concepts such as waste management and gray water recycling, indicating a developing understanding of environmental sustainability.

Moreover, prospective teacher educators with an adequate level of digital well-being

demonstrated a mature and informed perspective on the environmental effects of technology use. They acknowledged complex issues like climate change, radiation, deforestation, and forest fires, proposing practical solutions such as promoting wired internet, solar energy, gray water recycling, and the 3R (Reduce, Reuse, Recycle) formula. Furthermore, these prospective teacher educators also expressed awareness of the mental and physical health effects linked to digital technology. This group displayed readiness to adopt sustainable digital practices. Interestingly, prospective teacher educators with a high level of digital well-being expressed conflicting views regarding the impact of technology use on the environment. While some denied the environmental effects of 5G, they recognized issues like radiation and climate change, advocating for solar panels and the reuse of gadgets. This indicates that prospective teacher educators at this level may trust technology's benefits too strongly or lack critical insights into its environmental impacts.

Conclusion

In today's digital era, where technology permeates both personal and professional spheres, digital well-being has emerged as a critical concern. This study highlights that most prospective teacher educators exhibit an average level of both digital well-being and environmental concern. Interestingly, no significant gender differences were observed, suggesting a uniform level of digital engagement and environmental awareness across male and female participants. However, those from science backgrounds demonstrated higher levels of environmental awareness and digital well-being compared to their peers from the arts stream.

A strong positive correlation between digital well-being and environmental concern indicates that individuals who use technology mindfully are also more conscious of its environmental impacts. Prospective educators with low digital well-being expressed concerns mainly about 5G's impact on birds and supported renewable energy use. Those with average or adequate well-being showed broader awareness, including waste management and technology's role in climate change. In contrast, individuals with high digital well-being presented mixed views, often misinterpreting technological harms while focusing on app management and wildlife-related radiation concerns.

The findings suggest that awareness of responsible technology use is vital for environmental protection. However, most participants demonstrated general awareness based on local issues, lacking reference to the global environmental impacts of excessive technology use. This underscores the need to incorporate digital well-being and environmental education into teacher training programs.

Educational institutions should promote sustainable digital practices, such as energy-efficient usage, e-waste reduction, and awareness of digital carbon footprints. Integrating eco-digital education into the curriculum will empower future educators to make responsible technology choices, fostering both personal wellness and environmental stewardship. This holistic approach not only enhances the quality of life but also supports global sustainability goals.

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