The International Journal of Interdisciplinary Educational Studies
ISSN: 2327-011X (Print), ISSN: 2327-2570 (Online)
Volume 20, Issue 3
https://doi.org/10.18848/2327-011X/CGP/v20i03/95-120

Original Research

Strengthening Resilience in Economically Disadvantaged University Students amid Digital Challenges

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Received: 01/24/2024*;* ***Accepted:*** 01/23/2025; ***Published:*** 03/19/2025

Abstract: The transformative impact of digital technologies and social media platforms has created a gap in understanding how these elements influence the well-being of university students from lower socio-economic backgrounds. The purpose of this research was to unravel the intricate interplay between digital technologies, social media, well-being, and psychological resilience among university students characterized by lower socio-economic backgrounds. Employing a mixed-methods approach, the investigation systematically scrutinizes correlations among digital technology use, social media engagement, online communication, well-being, mental health, psychological challenges, and the cultivation of robust digital habits and resilience. The findings underscored the pivotal role of targeted interventions dedicated to nurturing healthy digital habits, mitigating digital stress, and fostering positive online interactions. Correlations revealed nuanced connections within the domains of well-being and resilience, emphasizing the imperative for comprehensive intervention strategies. Qualitative insights highlighted the success and adaptability of the intervention across diverse contexts, especially among individuals from economically disadvantaged households. Notably, participants exhibited heightened receptivity, potentially attributed to their familiarity with digital challenges and a strong motivation to enhance digital well-being. The intervention, featuring online workshops, themed activities, and avatars, yielded positive impacts on participants' perspectives, concurrently shedding light on the pronounced influence of socio-economic disparities on their digital experiences. Discrepancies in prior exposure to digital well-being initiatives and sociocultural factors contributed to variations in interpretations and feedback. The study suggests that future research should delve into the enduring effects of interventions targeting the promotion of healthy digital habits, coping strategies, and positive online interactions among university students.

Keywords: *Digital Well-Being, Mixed-Methods Approach, Psychological Resilience, Socio-Economic Background, University Students*

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Introduction

The increasing integration of digital technologies into everyday life has profoundly reshaped how university students interact, learn, and manage their well-being (Alalwan 2022; Haleem et al. 2022; Raja and Nagasubramani 2018). Over the past decade, the rapid proliferation of

smartphones, social media platforms, and online communication tools has created new opportunities for academic engagement and personal growth. However, this digital transformation has also introduced significant challenges, particularly for students from economically disadvantaged backgrounds. The disparities in access to digital tools, coupled with the psychological stressors associated with excessive usage, have emerged as pressing issues in higher education (Aalbers et al. 2019; Chukwuere and Chukwuere 2017).

Recent research highlights the dual impact of digital engagement (Hanprathet et al. 2015; Chen and Xiao 2022). On the other hand, they can contribute to social isolation, anxiety, and maladaptive behaviors, particularly when students lack the skills or resources to navigate these technologies effectively (Keane et al. 2023). For students from lower socio-economic backgrounds, these challenges are exacerbated by limited digital access and a lack of institutional support, leading to heightened vulnerability to digital stress (Voloshyna et al. 2022; Walsh 2022; Karim et al. 2020; Keles et al. 2020).

Despite the growing body of research, a gap remains in understanding how digital technologies and social media influence the well-being of university students from lower socio-economic backgrounds. A substantial proportion of Ukrainian students (approximately 34% as of 2016, increasing to 40% in 2021) come from economically disadvantaged households, facing unique financial challenges in accessing higher education (State Statistics Service of Ukraine 2022). While some studies have examined the links between digital technology use (DTE) and mental health outcomes, little attention has been given to the psychological processes and individual variations that may moderate these effects, especially among students from lower socio-economic backgrounds (Small et al. 2020).

This study builds on existing literature by investigating these dynamics through a socio-economic lens, employing a mixed-methods approach to explore how digital technologies affect well-being and resilience. By integrating theoretical frameworks such as Social Cognitive Theory, Ecological Systems Theory, and Positive Computing Framework, this research provides a comprehensive analysis of the interplay between digital engagement and psychological health. The findings aim to inform targeted interventions that address the unique challenges faced by economically disadvantaged students, promoting equitable access to digital opportunities and fostering resilience in the digital age.

This research was inspired by the observation that economically disadvantaged students frequently lack the resources and coping strategies necessary to manage the demands of digital engagement effectively. Drawing on my academic and practical experience, the authors sought to investigate the intricate interplay between DTE, social media engagement, and the psychological resilience of these students. By employing a mixed-methods approach and integrating theoretical frameworks such as Social Cognitive Theory and Ecological Systems Theory, this study aims to provide a holistic understanding of these dynamics. Furthermore, the research introduces a targeted intervention program designed to foster healthy digital habits

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and enhance resilience, offering both theoretical insights and practical strategies to address the unique challenges faced by this population. This work not only fills a critical gap in the literature but also seeks to empower economically disadvantaged students to navigate the digital landscape with greater confidence and well-being.

Literature Review

Theoretical Framework

The study employed five theoretical frameworks to comprehensively analyze the dynamics and outcomes of digital interactions in well-being and resilience research. These include Social Cognitive Theory (Bandura 1986), Ecological Systems Theory (Bronfenbrenner 1979), Coping Theory (Folkman and Lazarus 1985), Digital Divide Theories (Pick and Sarkar 2016), and Positive Computing Framework (Calvo and Peters 2014). Integrating these frameworks provides a structured lens for understanding the digital experiences of university students from lower socio-economic backgrounds, while also serving as a comprehensive approach to address their challenges in the digital age.

1. Social Cognitive Theory: Bandura's theory highlights observational learning, self-efficacy, and reciprocal determinism, explaining how students' beliefs and behaviors are shaped by observing role models and peers.
2. Ecological Systems Theory: Bronfenbrenner's framework examines how interconnected systems like family, school, and community influence students' resilience and digital experiences.
3. Coping Theory: Lazarus and Folkman's model focuses on how individuals assess stress and apply strategies to handle challenges, underpinning the study's exploration of students' digital stress management.
4. Digital Divide Theories: Pick and Sarkar's theories address socio-economic disparities in accessing and utilizing digital tools, providing insight into their impact on students' digital engagement and resilience.
5. Positive Computing Framework: Calvo and Peters emphasize designing technology to promote well-being, informing interventions to build positive digital habits and resilience.

Digital Technologies, Social Media, and Resilience in Disadvantaged Students

Recent concerns highlight the impact of digital technologies on well-being and psychological resilience, particularly among university students (Rodriguez et al. 2021). The digital age has transformed the university experience, emphasizing the need to explore these technologies' effects (Nkomo et al. 2021; Zlatkin-Troitschanskaia et al. 2021). Digital well-being emerges as a multidimensional construct, encompassing mental, emotional, and social health within

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digital interactions (Büchi 2021; Chen et al. 2023; Sekelová et al. 2023). Vanden Abeele (2021) introduces the concept of digital well-being, reflecting the intricate nature of individuals' relationships with digital devices. Understanding the impact of various digital tools, including mobile devices, web-based applications, AI-driven systems, and virtual reality environments, is crucial for assessing students' mental and emotional states (Vernice et al. 2021; Akinwalere and Ivanov 2022). The concept of psychological resilience is essential in understanding how university students cope with digital stressors (Brewer et al. 2019). Jiboc (2022) emphasizes exploring students' adaptive capacities and coping mechanisms to assess their ability to withstand digital disruptions and maintain psychological well-being. Studying factors that foster psychological resilience in the digital age can unveil protective mechanisms enhancing students' well-being (Freire et al. 2020). The study emphasizes the influence of social media on students' digital well-being and psychological resilience (Chen and Xiao 2022; Valkenburg 2022). Researchers explore both the benefits and drawbacks of social media usage, investigating its impact on social connections, communication habits, and networking experiences. Understanding the dynamics of online communication, including email, instant messaging, video conferencing, and social networking platforms, is crucial for examining the nature and quality of digital interactions. The existing studies primarily focus on mainstream university students, neglecting underrepresented or vulnerable groups like those from diverse cultural backgrounds, students with disabilities, and those from lower socio-economic backgrounds.

Thus, this study aims to fill this gap by enriching our understanding of the interplay between digital technologies, social media, and the well-being and psychological resilience of university students from lower socio-economic backgrounds. The research addresses key inquiries:

1. Is there a correlation between DTE, social media engagement, and online communication, and the well-being, mental health, and psychological resilience of economically disadvantaged university students?
2. What distinct psychological challenges and risks are associated with excessive use of digital technologies, social media platforms, and online communication among university students in the studied group?
3. What factors contribute to cultivating healthy digital habits and enhancing psychological resilience among the targeted student cohort?

Methods

This study employed a mixed-methods approach, integrating quantitative and qualitative methods to explore the intricate relationship between digital well-being, psychological resilience, and the use of digital technologies, social media, and online communication among university students from lower socio-economic backgrounds (Creamer and Reeping

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2020). The study focused on independent variables: DTE, social media engagement, online communication, and socio-economic background. Dependent variables included well-being, mental health, psychological resilience, challenges related to DTE, risks of excessive DTE, and factors contributing to healthy digital habits and enhanced psychological resilience. To ensure methodological clarity and align the study's variables with its theoretical framework, the following section provides operational definitions for the key variables examined in this research.

1. Digital Technology Engagement (DTE): This variable measures the frequency and nature of interactions with digital tools, including smartphones, laptops, and social media platforms. It includes dimensions such as active usage (e.g., learning and productivity) and self-regulation practices (e.g., limiting screen time).
2. Digital Environment Impact (DEI): This refers to the perceived influence of one's digital environment, including the role of peer networks, online communities, and institutional support, on overall well-being. It captures students' perceptions of how digital interactions shape their mental, emotional, and social health.
3. Coping Strategies for Digital Stress (CSDS): This variable encompasses behaviors and methods students employ to manage stress arising from digital engagement. Examples include seeking social support, mindfulness practices, and disengaging from negative online interactions.
4. Digital Access and Usage (DAU): This measures the availability and frequency of digital tool usage, focusing on socio-economic disparities. It includes indicators such as device ownership, internet access, and daily usage patterns.
5. Positive Digital Interactions (PDI): This captures the extent to which students experience meaningful, supportive, and growth-oriented interactions online, emphasizing connection, collaboration, and positive feedback from peers.
6. Psychological Resilience (PR): This variable assesses students' ability to adapt and maintain well-being in the face of digital challenges. It includes self-reported measures of emotional regulation, problem-solving, and persistence during stressful digital experiences.

Research Design

The research design timeline (which outlines the sequential phases and methods used to explore the relationships between digital well-being, PR, and the use of digital technologies,

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social media, and online communication among university students from lower socio-economic backgrounds) is presented in Figure 1.

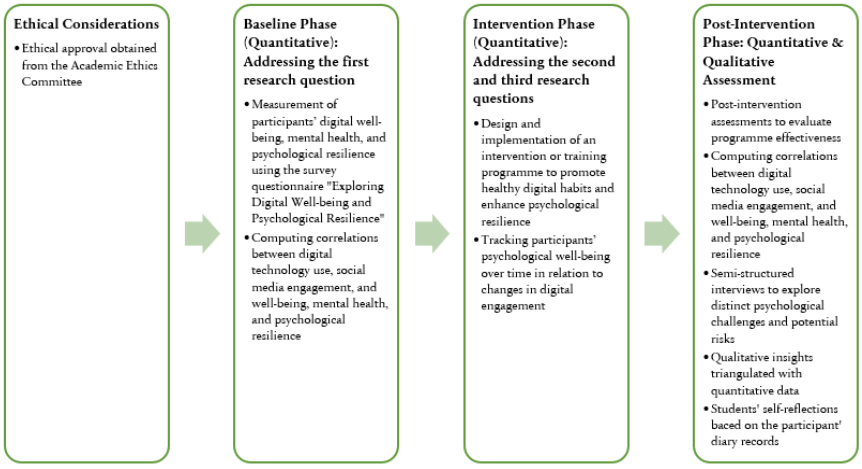

Figure 1: Visualized Flow of the Research Phases

As seen in Figure 1, the study employed a three-phase research design (baseline, intervention, and post-intervention) with prior ethical approval from the Academic Ethics Committee of the Faculty of Psychology at Drahomanov Ukrainian State University. The Baseline Phase (September 2022) utilized quantitative methods to address the first research question, examining correlations between DTE, social media engagement, well-being, mental health, and PR via the survey questionnaire "Exploring Digital Well-Being and Psychological Resilience" (see Appendix A). The Intervention Phase (October 2022–May 2023) employed a quantitative longitudinal one-group post-test design to address the second and third research questions, tracking participants' psychological well-being over time in relation to changes in digital engagement. It implemented an intervention program to foster healthy digital habits and PR, with post-intervention assessments evaluating program effectiveness. Qualitative elements included semi-structured interviews in June 2023 exploring psychological challenges and risks, and participants'-maintained diaries from October 2022 to May 2023 added depth to the qualitative exploration, combining qualitative insights with quantitative data.

Description of the Intervention

The intervention comprised interactive online workshops via Zoom, respecting privacy with cameras off. Themed "Dress Up Days" added enjoyment and fostered inclusivity, utilizing Zoom's breakout rooms for group activities. Participants used nicknames and avatars for anonymity, creating a conducive environment for open discussions on digital well-being and resilience. Workshops started bi-weekly, transitioning to monthly sessions for skill

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reinforcement. Midpoint check-ins occurred every two months, with intensive sessions toward the conclusion for key takeaways and comprehensive discussions. The diverse array of workshop topics and subtopics is detailed in Table 1, designed to infuse curiosity, adventure, and enjoyment into exploring digital well-being and PR.

Table 1: Workshop Topics, Subtopics, and Students' Skills to Train

#	*Workshop Topic*	*Subtopics*	*Skills/Techniques to Train*
1	Unveiling Digital Well-Being and Resilience: A Grand Introduction	(a) Exploring digital well-being and resilience (b) Balancing digital life with resilience	Mindfulness meditation: Introduce mindfulness meditation to enhance participants' awareness of digital interactions and encourage a balanced approach.
2	Digital Detox Adventure: Navigating the Virtual Wilderness	(a) Detoxifying digital distractions (b) Embracing mindful tech interactions in the digital wilderness	Breath awareness: Instruct deep breathing for stress management and mindful digital engagement. Device-free breaks: Advocate for regular screen breaks to recharge and alleviate digital overload.
3	Voyage to Positivity Island: Crafting Social Media Oasis	(a) Creating a positive online space (b) Navigating social media storms with resilience	Gratitude practice: Encourage journaling for a positive shift and to lessen the impact of social comparison. Empathy building: Emphasize the role of empathy in fostering a positive online environment.
4	Digital Chronicles: Building Bridges in the Virtual Realm	(a) Enhancing effective online communication (b) Navigating online challenges with resilience	Active listening skills: Train participants to enhance online communication and build connections. Setting communication boundaries: Teach participants to establish clear online interaction boundaries for preventing burnout.
5	Zen Garden of Resilience: Nurturing Inner Strength	(a) Managing digital stress: Effective strategies (b) Cultivating resilience in the digital universe	Stress reduction techniques: Introduce exercises for relief, such as progressive muscle relaxation or guided imagery. Cognitive reframing: Discuss the use of cognitive reframing to help participants manage digital stressors and challenges.
6	Time-Trekking Odyssey: Mapping Digital Boundaries	(a) Creating time sanctuaries and digital-free havens (b) Navigating the digital cosmos with time-traveling techniques	Pomodoro technique: Instruct participants on time management using the Pomodoro technique for a balanced approach to digital activities. Digital downtime rituals: Encourage participants to establish rituals marking the transition from digital to offline time.

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7	Digital Portraits: Carving Your Online Identity Sculpture	(a) Crafting an impactful online persona (b) Sculpting the masterpiece of online identity	Self-reflection exercises: Lead participants in activities for mindful online presence and positive digital footprint cultivation.
8	Mirror of Transformation: Reflecting on Personal Growth	(a) Balancing the digital equation (b) Quest for harmony between pixels and soul	Online reputation management: Provide strategies for maintaining a responsible and respectful online identity.
9	Quest for Digital Equilibrium: Balancing Pixels and Peace	(a) Balancing the digital equation (b) Seeking harmony between pixels and soul	Goal-setting strategies: Assist participants in setting and achieving realistic digital well-being goals.
10	Mindful Cyber Soirée: Celebrating Resilient Connections	(a) Joyful connections in the digital tapestry (b) Culminating with a mindful cyber soirée, uniting hearts across screens	Positive affirmations: Familiarize participants with affirmations for enhanced self-esteem and resilience in the digital realm.

Each workshop featured:

- Group discussions and personal experience sharing.
- Small group activities, problem-solving, and role-playing.
- Guided meditation, relaxation techniques.
- Case studies on digital well-being.
- Goal-setting and action planning for strategy implementation.

Guest speakers enriched the experience with diverse insights. The series aimed to foster active engagement, learning, and skill development for navigating the digital world with resilience and well-being.

Sample

The baseline phase employed convenience sampling, collecting data from university students across multiple institutions, including Dragomanov Ukrainian State University (DUSU), Kyiv National Linguistic University (KNLU), Sumy State Pedagogical University (SSPU), National Aviation University (NAU), Lviv Polytechnic National University (LPNU), The National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (NTUU), State University of Infrastructure and Technologies (SUIT), Kyiv National Economic University named after Vadym Hetman (KNEU), National University of Kyiv Mohyla Academy (NUKMU), and Bogomolets National Medical University (BNMU). Demographic data covered socio-economic backgrounds, digital technology usage, social media frequency, and self-rated well-being. This diverse approach enhanced understanding. Using a 95% confidence level, 5% margin of error, and an estimated population proportion

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of 50%, the sample size was 385 students. The survey went to 1,050 students, with 402 responses from lower socio-economic backgrounds considered. In the intervention phase, thirty-seven students in the Experimental Group (EG) were anonymously engaged through convenience sampling. This inclusive mix aimed to address challenges and foster collaborative learning. Purposive sampling selected twelve EG participants for semi-structured interviews.

Data Collection and Analysis

Data collection involved a Ukrainian version of the "Exploring Digital Well-Being and Psychological Resilience" survey questionnaire (Appendix A) and a semi-structured interview guide (Appendix B). Demographics from the survey were used for analysis, excluding them from reporting. Data from midpoint check-in sessions were utilized to adapt the intervention and highlight positive outcomes. All Ukrainian data were translated into English. Facilitators employed various methods during midpoint check-ins, including active note-taking and session recording for subsequent analysis. Quantitative data from the survey were analyzed using Jamovi software (version 2.2.5). Focus interviews, conducted in Ukrainian via Zoom, were recorded and transcribed using Happy Scribe, an online tool supporting multiple languages, including Ukrainian. Transcriptions were reviewed for precision and clarity. Emerging themes were systematically examined, and relevant sections were coded for analysis. A comparative analysis discerned similarities, discrepancies, and contradictions within participants' viewpoints and experiences.

The survey questionnaire, designed in Ukrainian with twenty-seven questions aligned with theoretical frameworks, underwent rigorous review for face and content validity (content validity index: .928, Fleiss's Kappa coefficient: .446, Cronbach's α: .927). The semi-structured interview questionnaire, with twenty open-ended questions, underwent expert validation, showing good face and content validity (IL-CVI: .917, Fleiss's Kappa: .502), demonstrating reliability and suitability for statistical analysis. Both research tools demonstrated consensus among experts, affirming their reliability and suitability for statistical utilization in this study.

Ethical Considerations

Before participating in the survey and interviews, participants were briefed on the voluntary nature of their involvement and the strict confidentiality of their responses. They willingly consented to the use of their responses in the academic publication. To ensure privacy, all collected data were carefully managed, and identifiable information was anonymized before dissemination.

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Results

The study's findings are organized and presented according to the three phases: baseline, intervention, and post-intervention. Within each phase, the quantitative aspects are showcased through descriptive statistics, followed by the presentation of correlation analyses. In parallel, the qualitative findings encapsulate the principal themes arising from the interviews and the reflections chronicled in students' diaries.

Pre-Intervention Quantitative Measurements

The survey, "Exploring Digital Well-Being and Psychological Resilience," among lower socio-economic students, reveals positive trends in DTE with mean values from 3.24 to 4.06. Notably, "DTE4" (M = 4.06; SD = .886) shows robust agreement on regulating digital use for well-being, while concerns emerge in "DTE6" (M = 3.24; SD = 1.245), indicating variability in self-efficacy impact on well-being. Participants express confidence in effective digital use, risk recognition, and regulation. These findings align with Social Cognitive Theory, which emphasizes self-efficacy and observational learning in shaping behavior.

Regarding the digital environment (DEI), mean values range from 3.47 to 3.64, with "DEI1" (M = 3.63; SD = 1.203) emphasizing strong agreement on the social circle's influence. This supports Ecological Systems Theory, highlighting the role of family and community in digital behavior. Socio-economic background influences DAU, yielding varied responses. CSDS show a preference (M_{range}: 2.74–3.29), with "CSDS1" (M = 2.74; SD = 1.204) indicating a tendency to seek support from friends or family during negative online experiences, consent with Coping Theory. Active coping strategies for psychological well-being vary in frequency. Exploration of DAU reveals diverse engagement (M_{range}: 3.19–3.73), with "DAU2" (M = 3.73; SD = 1.214) highlighting a moderate preference for frequent daily digital use. Participants generally believe their socio-economic background allows access and benefit from digital technologies. Investigation into positive digital interactions (PDI) (M_{range}: 2.99–3.33) shows "PDI1" (M = 3.33; SD = 1.286) suggesting moderately frequent connection through online interactions. Participants report varying degrees of connection, personal growth, and preferences influenced by socio-economic background. These analytical insights offer a nuanced understanding of the interplay between digital engagement, well-being, and socio-economic factors among surveyed students.

Table 2's correlation matrix illuminates relationships among variables in the study on Digital Well-Being and Psychological Resilience in University Students from Lower Socio-Economic Backgrounds. Featuring Pearson's r, Spearman's rho, and Kendall's Tau B coefficients, accompanied by respective p-values, it gauges the significance of these correlations.

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Table 2: Matrix of Correlations Between the Variables in the Study

Variable	*Coefficient*	*DTE*	*DEI*	*CSDS*	*DAU*	*PDI*
DTE	Pearson's *r*	—				
	p-value	—				
	Spearman's rho	—				
	p-value	—				
	Kendall's Tau B	—				
	p-value	—				
DEI	Pearson's *r*	−0.048*	—			
	p-value	.031	—			
	Spearman's rho	−0.056*	—			
	p-value	.011	—			
	Kendall's Tau B	−0.047*	—			
	p-value	.011	—			
CSDS	Pearson's *r*	.042	.002	—		
	p-value	.091	.935	—		
	Spearman's rho	.039	−0.007	—		
	p-value	.114	.791	—		
	Kendall's Tau B	.033	−0.005	—		
	p-value	.114	.792	—		
DAU	Pearson's *r*	.031	−0.021	−0.100 ***	—	
	p-value	.281	.463	< .001	—	
	Spearman's rho	.032	−0.009	−0.100 ***	—	
	p-value	.273	.754	< .001	—	
	Kendall's Tau B	.026	−0.007	−0.082 ***	—	
	p-value	.271	.751	< .001	—	
PDI	Pearson's *r*	−0.028	.017	.052*	−0.003	—
	p-value	.264	.500	.039	.922	—
	Spearman's rho	−0.028	.016	.060*	.001	—
	p-value	.267	.522	.017	.971	—
	Kendall's Tau B	−0.023	.013	.047*	.001	—
	p-value	.268	.516	.020	.966	—

Note: *$p < .05$, **$p < .01$, ***$p < .001$.

Table 2 reveals a significant negative correlation between DEI and DTE ($p = .031$), indicating reduced engagement corresponds to intensified perceptions of digital environments. A robust negative correlation emerges between DAU and PDI ($p = .039$), suggesting increased technology use may lead to fewer positive online interactions. A compelling positive correlation is observed between DAU and CSDS ($p < .001$), implying heightened access coincides with a stronger preference for digital stress coping strategies. Notably, DTE lacks statistically significant correlations ($p > .05$). DEI displays a modest negative correlation with psychological challenges related to DTE ($p < .05$). CSDS lacks significant correlations ($p > .05$). Regarding DAU's link to Psychological Challenges and Negative DEI, a weak positive correlation is observed (Pearson's $r = .031$, $p > .05$). Lastly,

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Positive Digital Interactions (PDI) exhibit a slight positive correlation with DEI (Pearson's *r* = .052, *p*e = .039), but not with DTE and CSDS.

Post-Intervention Quantitative and Qualitative Assessments

Post-Intervention Descriptive Statistics from the survey "Exploring Digital Well-Being and Psychological Resilience" reveal socio-economic disparities (*1, *2, *3). Lower socio-economic participants (*1) demonstrated higher mean scores in DTE1 (*M* = 4.33; SD = .724) and DTE4 (*M* = 4.33; SD = .724) than middle (*2) (DTE1 – *M* = 4.31; SD = .793, DTE4 – *M* = 4.33; SD = .524) and upper (*3) socio-economic counterparts (DTE1 – *M* = 4.00; SD = .894, DTE4 – *M* = 4.17; SD = .983). Conversely, DTE6 indicated the lowest mean score for upper socio-economic (*3) participants (*M* = 3.17; SD = 1.169). This reflects themes from Digital Divide Theories, which address disparities in access and outcomes based on socio-economic factors.

Middle socio-economic participants (*2) scored lower in DEI2 (*M* = 3.75; SD = .867), while upper socio-economic (*3) participants scored higher in DEI3 (*M* = 3.94; SD = .996) and DEI4 (*M* = 4.00; SD = .967). For CSDS, upper socio-economic (*3) participants had a superior mean score in CSDS3 (*M* = 4.67; SD = .667), while lower socio-economic (*1) participants scored higher in CSDS1 (*M* = 3.20; SD = .314). In DAU, lower socio-economic (*1) participants had a higher mean score in DAU2 (*M* = 3.73; SD = .352), while upper socio-economic (*3) participants scored higher in DAU3 (*M* = 3.75; SD = 1.267). PDI findings show higher mean scores in PDI3 (*M* = 3.83; SD = .567) and PDI4 (*M* = 4.17; SD = .567) for upper socio-economic (*3) participants.

Lower socio-economic students generally outperformed peers, possibly due to digital vulnerabilities and heightened familiarity. Motivation for digital well-being improvement could be a key factor, empowered by the intervention's relevance. Socio-economic disparities likely influenced contextual attributes and engagement, with varied exposure to digital well-being initiatives and sociocultural factors explaining response variations. Correlation analysis using EG data from lower socio-economic students sheds light on relationships between digital well-being and psychological resilience (Table 3).

Table 3: Correlation of Digital Well-Being and Psychological Resilience Variables

Variable	*Coefficient*	*DTE*	*DEI*	*CSDS*	*DAU*	*PDI*
DTE	Pearson's *r*	—				
	p-value	—				
	Spearman's rho	—				
	p-value	—				
	Kendall's Tau B	—				
	p-value	—				

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DEI	Pearson's *r*	.230*	—			
	p-value	.047	—			
	Spearman's rho	.236*	—			
	p-value	.042	—			
	Kendall's Tau B	.215*	—			
	p-value	.039	—			
CSDS	Pearson's *r*	−0.037	.034	—		
	p-value	.782	.797	—		
	Spearman's rho	−0.069	.023	—		
	p-value	.599	.863	—		
	Kendall's Tau B	−0.063	.018	—		
	p-value	.584	.877	—		
DAU	Pearson's *r*	.099	.164	−0.511	—	
	p-value	.518	.280	0.003	—	
	Spearman's rho	.110	.166	0.507	—	
	p-value	.473	.277	0.004	—	
	Kendall's Tau B	.105	.143	0.513	—	
	p-value	.423	.277	0.004	—	
PDI	Pearson's *r*	.165	−0.008	0.776	−0.053	—
	p-value	.280	.957	0.022	.731	—
	Spearman's rho	.178	.026	0.776	−0.037	—
	p-value	.242	.863	0.021	.811	—
	Kendall's Tau B	.165	.044	0.770	−0.032	—
	p-value	.209	.738	0.042	.802	—

Note: *$p < .05$, **$p < .01$, ***$p < .001$.

Table 3 shows positive correlations between DTE and DEI ($r = .230$; $p < .05$), indicating increased engagement relates to heightened awareness of digital impact. Conversely, a negative correlation exists between DTE and CSDS ($r = -0.037$; $p > .05$), suggesting limited impact on stress management. DTE correlates constructively with DAU ($r = .099$; $p > .05$) and modestly with PDI ($r = .165$; $p > .05$). Similar patterns in DEI, CSDS, DAU, and PDI suggest restrained associations within lower socio-economic students ($p < .05$). Insights drawn include heightened engagement linked to increased digital impact recognition and positive interactions, complex relationships among DTE, CSDS, and DAU, the need for qualitative analysis for a comprehensive assessment, and the challenge of attributing changes solely to the intervention due to multifaceted factors.

Qualitative Insights: Psychological Challenges and Risks of Digital Tech Use

Student interview responses strongly indicate that the intervention effectively achieved its objectives. By promoting positive digital habits, enhancing psychological resilience, and advocating a balanced approach to digital technology, the intervention demonstrated

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efficacy. Cohesive narratives from the interviews collectively affirm success in advancing digital well-being and strengthening PR among EG students, aligning closely with the intervention's goals. Thematic patterns in responses underscore the intervention's effectiveness in addressing distinct psychological challenges and risks associated with excessive DTE among the studied university students.

Intervention findings from semi-structured interviews with the EG student cohort reveal the following: (a) Positive Impact: The intervention positively influenced digital well-being and PR, providing educational resources and social connections during challenging times; (b) Increased Awareness: Participants became more aware of digital challenges, reflecting the intervention's success in promoting reflective thinking about digital behaviors; (c) Enhanced Coping Strategies: Participants developed effective coping strategies, such as mindfulness and screen time management, demonstrating the intervention's role in building digital resilience; (d) Balancing Digital Engagement: Participants emphasized the importance of balanced digital and real-life experiences, aligning with the intervention's focus on setting boundaries; (e) Socio-economic Dimensions: Lower socio-economic participants highlighted financial constraints, and the intervention's adaptability addressed these concerns; (f) Social Media's Impact: Social media posed challenges like self-comparisons and exposure to negative content. The intervention's emphasis on fostering positive online interactions improved PR.

Research findings outline psychological challenges and risks associated with extensive DTE among university students: (a) Well-Being Impact: Excessive DTE, especially on social media, led to anxiety, distraction, and reduced focus, contributing to increased stress; (b) Social Comparison: Excessive social media use fostered social comparison and self-esteem issues; (c) Negative Online Interactions: Encounters with negative online comments and debates affected PR; (d) Digital Stress: Excessive digital engagement resulted in digital stress, managed through strategies like breaks and mindfulness; (e) Privacy Concerns: Online misunderstandings led to trust concerns, impacting mental well-being; (f) Fear of Missing Out (FOMO): The fear of missing out on online content contributed to stress and feelings of inadequacy; (g) Impact on Relationships: Excessive digital use reduced face-to-face interactions, potentially causing social isolation; (h) Socio-economic Barriers: Lower socio-economic participants faced challenges related to access to devices and online resources; (i) Digital Environment: The digital environment shaped participants' experiences and PR; (j) Vulnerability to Negative Content: Exposure to negative online content increased susceptibility to emotional challenges and stress.

Diary Documentation: Building Positive Digital Habits and Resilience

This section provides insights into the impact of the intervention on participants' digital habits and PR. Diary entries captured transformative moments, showcasing a shift toward

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healthier digital engagement. Table 4 offers a concise summary of diary entries and themes, presenting key findings.

Table 4: Diary Entries/Themes and Synopsis of Findings

Diary Entries/Themes	*Synopsis of Findings*
Initial Expectations and Engagement	Participants enthusiastically embraced the intervention's unique approach with themed workshops and interactive activities, fostering curiosity and engagement. Initial skepticism about online workshops shifted to a sense of belonging and purpose.
Heightened Self-Awareness	Diary entries highlighted a growing awareness of the impact of digital behaviors on mental well-being. Participants acknowledged the negative effects of excessive digital engagement on focus, productivity, and mood, prompting increased self-reflection and efforts to adopt healthier digital practices.
Skill Acquisition and Coping Strategies	Entries showcased the effective adoption of coping strategies for digital stress, drawing on workshop techniques such as disconnecting from distractions and practicing mindfulness. These strategies helped participants navigate online spaces and manage information overload.
Positive Digital Interactions	Diary entries demonstrated positive online interactions influenced by the intervention's emphasis on building supportive digital communities. Participants supported and encouraged peers in virtual forums, fostering responsibility for a positive online environment.
Empowerment and Confidence	Diary entries revealed enhanced empowerment and confidence in mindful digital platform use. Participants developed skills to set boundaries, manage notifications, and prioritize real-life connections, showcasing the intervention's impact on their ability to control digital experiences.
Resilience in the Face of Challenges	Diary entries disclosed encounters with online negativity and misinformation. Workshop techniques were applied to boost resilience, handle negativity, and disengage from unproductive debates.
Long-Term Impact	Diary entries indicated a shift in digital habits, with participants incorporating learned strategies into daily routines, reflecting a lasting impact on their digital engagement.
Overall Reflections	Participants' reflections emphasized heightened self-awareness, coping strategies, improved online interactions, and a sense of empowerment.

As can be drawn from Table 4, participants' reflections underscored augmented self-awareness, the assimilation of effective coping mechanisms, improved digital interactions, and a heightened sense of empowerment as outcomes of the intervention.

Qualitative findings also emphasize the role of Positive Computing Framework in fostering resilience and digital well-being. For example, participants highlighted skill-building workshops that promoted mindfulness and self-regulation. These interventions addressed the psychological challenges noted during the intervention phase, including managing digital stress, setting boundaries, and fostering positive online interactions. The success of these approaches demonstrates the practical application of this framework in addressing digital engagement challenges.

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Overall, the integration of these theoretical frameworks—Social Cognitive Theory, Ecological Systems Theory, Coping Theory, Digital Divide Theories, and Positive Computing Framework—helped to contextualize the findings and provided actionable strategies for fostering resilience and well-being among economically disadvantaged university students. This multifaceted approach underscores the importance of targeted interventions in bridging the digital divide and enhancing psychological resilience in the digital age.

Discussion

This study investigates the relationship between digital technologies, well-being, and resilience in university students from diverse socio-economic backgrounds, emphasizing the importance of contextual factors. By integrating correlation analyses with qualitative insights, it provides a nuanced understanding of how digital engagement intersects with well-being, mental health, and psychological resilience. The study's novelty lies in its exploration of socio-economic influences and the use of a mixed-methods approach to reveal connections between digital engagement, coping strategies, online communication, and well-being.

The findings reveal both the transformative potential and the psychological risks of DTE. On the positive side, participants displayed a strong inclination toward using digital tools effectively, with many actively regulating their usage to promote well-being. This aligns with the importance of self-efficacy, as highlighted by Social Cognitive Theory, in shaping responsible digital behavior. The ability to self-regulate digital habits appears essential for fostering resilience, yet variability in self-efficacy, exemplified by "DTE6," underscores the difficulty some students face in achieving consistent positive outcomes. Excessive digital use, particularly on social media, was linked to psychological risks such as anxiety, distraction, and reduced focus, findings consistent with Small et al.'s (2020) research on the adverse effects of technology. The phenomena of social comparison and exposure to negative interactions on social media further exacerbated stress and self-esteem issues, suggesting that the interplay between digital engagement and psychological health is both intricate and context-dependent.

Qualitative assessments deepened this understanding, highlighting digital stress, privacy concerns, and a FOMO as significant challenges for students. These stressors were more pronounced in students with frequent online engagement, reinforcing findings on the psychological toll of excessive digital use (Karim et al. 2020). At the same time, the participants demonstrated a capacity for resilience through active coping strategies, such as mindfulness, time management, and seeking emotional support, which align with Coping Theory. These strategies were particularly effective in mitigating digital stress, providing a pathway for maintaining well-being despite the inherent challenges of digital life.

Importantly, the study identified key factors that contribute to developing healthy digital habits and enhancing resilience. Social support emerged as a critical influence, as participants

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emphasized the role of their immediate social circle, consistent with Ecological Systems Theory. Additionally, the incorporation of mindfulness practices and digital literacy skills empowered students to navigate their digital environments more effectively, reflecting the principles of the Positive Computing Framework. The nuanced role of socio-economic background was evident, as students from lower socio-economic contexts showed heightened receptiveness to interventions, likely driven by their familiarity with digital limitations and a stronger motivation for self-improvement.

These findings underscore the importance of tailoring interventions to address socio-economic disparities. Workshops focusing on digital literacy, mindfulness, and positive online interactions demonstrated significant potential in fostering psychological resilience and mitigating risks associated with excessive digital engagement. By bridging gaps in digital access and equipping students with tools for healthy engagement, such interventions can serve as a model for promoting well-being in vulnerable populations.

Conclusion

This study underscores the dual nature of digital technologies in university life. While they offer significant opportunities for engagement and learning, they also pose challenges, particularly when usage becomes excessive or unregulated. Interventions fostering healthy digital habits, improving access, and promoting resilience are essential to mitigate these risks and maximize the benefits of digital engagement, particularly for economically disadvantaged students. Participants from lower socio-economic backgrounds, more susceptible to digital challenges, demonstrated heightened receptiveness to interventions promoting healthy digital habits, coping strategies, and positive online interactions. Their active engagement stemmed from familiarity with digital limitations and a strong motivation for improvement. The intervention's resonance with individual circumstances empowered participants, highlighting socio-economic disparities. Variances in exposure to digital initiatives and sociocultural factors led to diverse interpretations and feedback. The intervention's format—including Zoom workshops, themed activities, and avatars—positively influenced participants' perceptions and digital behaviors, as revealed in qualitative assessments. By addressing psychological risks such as digital stress, privacy concerns, and social comparison, the intervention fostered resilience and promoted mindful technology use. Further research is needed to explore the long-term effects of such interventions among university students, particularly in diverse socio-economic contexts. Expanding these studies to include longitudinal analyses and larger sample sizes could enhance our understanding of how digital well-being and resilience can be sustainably cultivated in vulnerable populations.

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Implications and Practical Solutions

The findings of this study hold significant practical implications for addressing the digital challenges faced by university students, particularly those from lower socio-economic backgrounds. To mitigate risks associated with excessive DTE, interventions should focus on fostering digital literacy, encouraging mindfulness practices, and promoting time management strategies. Educational institutions can implement workshops aimed at teaching students how to manage their digital interactions effectively, reduce screen time, and balance their digital and offline lives. Policymakers can support these initiatives by ensuring equitable access to digital tools and resources for economically disadvantaged students. Providing affordable or subsidized internet access and devices is crucial to bridging the digital divide. Additionally, designing institutional support systems, such as peer mentoring and digital well-being programs, can create a supportive environment that fosters resilience. Practitioners working with students can also apply these findings by integrating psychological resilience training into their counselling practices. Tailored interventions, such as cognitive-behavioral techniques to combat digital stress and workshops on developing positive online interactions, can help students navigate the challenges of the digital age effectively.

AI Acknowledgment

We acknowledge the use of Grammarly (https://www.grammarly.com/) and ChatGPT—AI technology-driven tools—to enhance the clarity, language, and readability of the article, as well as for grammar and spelling checks, and translation. Grammarly was utilized without the use of any prompts. For ChatGPT, the following prompt was employed: 1. Please check and correct the language of this text (paragraph). Improve its readability and clarity. The output from these tools was used to improve the quality of the manuscript's language and to reduce publication costs.

Informed Consent

The authors have obtained informed consent from all participants.

Conflict of Interest

The authors declare that there is no conflict of interest.

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Appendices

Appendix A

Survey Questionnaire: Exploring Digital Well-Being and Psychological Resilience (Ukrainian version of the questionnaire can be accessed at: https://forms.gle/DG3vTTnuFDK4sLFD7)

Section 1: Digital Technology Engagement

Please rate your agreement with the following statements:

#	*Item*	*Likert Scale*				
		1	*2*	*3*	*4*	*5*
1	I feel confident in my ability to use digital technologies and social media effectively.					
2	I believe that engaging with social media can positively influence my well-being.					
3	I am aware of the potential risks associated with my online interactions.					
4	I actively regulate my usage of digital technologies to maintain a healthy balance.					
5	I often observe the digital habits of others and consider how they impact my own behavior.					
6	I believe that my self-efficacy in using digital technologies affects my overall well-being.					
7	I find that my self-regulation in digital usage contributes to my psychological resilience.					

Note: 1–Strongly Disagree; 2–Disagree; 3–Neutral; 4–Agree; 5–Strongly Agree.

Section 2: Digital Environment Impact

Please rate your experiences within different digital environments:

#	*Item*	*Likert Scale*				
		1	*2*	*3*	*4*	*5*
1	How does your immediate social circle (friends, family) influence your digital habits and well-being?					
2	How does your university's support and resources impact your digital experiences and psychological resilience?					
3	How do societal influences (cultural norms, economic conditions) affect your interactions with digital technologies?					
4	How would you rate the influence of your digital interactions on your mental health?					
5*	How does your socio-economic background impact your access to and usage of digital technologies?					

Note: 1–Very Negative (*Strongly Limiting); 2–Negative (*Limiting); 3–Neutral (*Neutral); 4–Positive (*Enabling); 5–Very Positive (*Strongly Enabling)

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Section 3: Coping Strategies in Digital Stress

Please rate your preferred coping strategies in digital stress situations:

1. When faced with negative online experiences, I tend to:
   (1) Avoid the situation; (2) Seek support from friends or family; (3) Engage in positive online interactions; (4) Other.
2. How effective do you find your chosen coping strategies in maintaining your psychological well-being?
   (1) Not Effective; (2) Somewhat Effective; (3) Moderately Effective; (4) Very Effective; (5) Extremely Effective
3. How often do you find yourself employing active coping strategies to deal with digital-related stress?
   (1) Never; (2) Rarely; (3) Sometimes; (4) Often; (5) Always
4. How frequently do you seek emotional support from online platforms when facing digital stressors?
   (1) Never; (2) Rarely; (3) Sometimes; (4) Often; (5) Always

Section 4: Digital Access and Usage

Please rate your experiences related to DAU:

1. How would you describe your level of digital access (e.g. internet, devices)?
   (1) Very Limited; (2) Limited; (3) Adequate; (4) Extensive; (5) Very Extensive
2. Have you encountered any barriers to using digital technologies due to limited resources?
   (1) Frequently (2) Occasionally; (3) Rarely (4) Never
3. How does your socio-economic background influence your ability to access and benefit from digital technologies?
   (1) Strongly Limiting; (2) Limiting; (3) Neutral; (4) Enabling; (5) Strongly Enabling

Section 5: Positive Digital Interactions

Please rate your experiences of PDI:

1. How often do you feel a sense of connection or belonging through your online interactions?
   (1) Never; (2) Rarely; (3) Sometimes; (4) Often; (5) Always
2. How frequently do your digital interactions inspire personal growth or development?
   (1) Never; (2) Rarely; (3) Sometimes; (4) Often; (5) Always
3. Do you actively seek out digital platforms that promote well-being and positivity?
   (1) Never; (2) Rarely; (3) Sometimes; (4) Often; (5) Always
4. How does your socio-economic background influence your preferences for positive digital experiences?
   (1) Strongly Limiting; (2) Limiting; (3) Neutral; (4) Enabling; (5) Strongly Enabling

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Section 6: Demographic Information (DI)

1. Please indicate your current socio-economic background:
   (1) Lower; (2) Middle; (3) Upper
2. How frequently do you use digital technologies and social media on a daily basis?
   (1) Rarely; (2) Occasionally; (3) Moderately; (4) Frequently; (5) Very Frequently
3. How would you rate your overall well-being and psychological resilience?
   (1) Very Poor; (2) Poor; (3) Neutral; (4) Good; (5) Very Good

Appendix B

Interview Guide for Interviewers on Digital Well-Being and Psychological Resilience

Introduction:

- Thank the participant for their willingness to participate.
- Explain the purpose of the interview: to understand their experiences, challenges, and perceptions related to digital technology use, social media engagement, and online communication.
- Assure confidentiality and explain that their responses will contribute to valuable insights.

Section 1: Digital Technology Use and Well-Being

1. Can you describe your typical usage of digital technologies (smartphones, computers, etc.) on a daily basis?
2. How do you feel digital technology use impacts your overall well-being and mental health?
3. Are there any specific positive effects you have noticed in your well-being due to digital technology use?
4. Conversely, have you experienced any negative effects on your well-being due to digital technology use?

Section 2: Social Media Engagement and Psychological Resilience

5. How often do you engage with social media platforms? What do you usually do on these platforms?
6. Do you think your engagement with social media has any influence on your psychological resilience? Please elaborate.
7. Have you encountered any challenges or difficulties related to social media engagement that affected your psychological well-being? Can you provide an example?
8. How do you manage any negative feelings or challenges that may arise from social media interactions?

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Section 3: Online Communication and Personal Experiences

9. How do you typically communicate with others online (e.g., messaging apps, social media messaging)?

10. Have you experienced any unique benefits or drawbacks when it comes to online communication compared to face-to-face interactions?

11. Can you share a specific experience where online communication positively or negatively impacted your well-being or psychological resilience?

Section 4: Distinct Psychological Challenges and Potential Risks

12. Are there any aspects of digital technology use, social media engagement, or online communication that you find challenging or worrisome? Please explain.

13. Have you ever encountered situations online that made you feel anxious, stressed, or socially isolated? Can you describe such an instance?

14. What potential risks do you associate with excessive use of digital technologies and social media platforms, if any?

Section 5: Coping Strategies and Digital Resilience

15. How do you cope with digital-related stressors or challenges? Are there specific strategies or approaches you use?

16. Have you found any particular coping strategies to be more effective in maintaining your psychological well-being in the digital age?

17. Are there instances where your digital interactions helped you build psychological resilience or overcome challenges? Please share.

Section 6: Socio-Economic Background and Digital Experiences

18. How do you think your socio-economic background influences your experiences with digital technologies, social media, and online communication?

19. Have financial constraints ever impacted your ability to engage with digital technologies or participate in online activities? Please elaborate.

Closing

20. Is there anything else you would like to share about your experiences, challenges, or insights related to digital technology use and psychological well-being?

Thank the participant for their time and valuable contributions.

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