

## DETERMINANTS OF DIGITAL WELL-BEING AMONG UNIVERSITY STUDENTS IN KYRGYZSTAN

### DETERMINANTES DO BEM-ESTAR DIGITAL ENTRE ESTUDANTES UNIVERSITÁRIOS NO QUIRGUISTÃO

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#### Abstract

This research looks at the digital well-being of university students in Kyrgyzstan and the factors that shape it. Digital transformation today affects not only education but also everyday life, a connection that is especially worth examining in relation to technology and young people. The study was carried out with 501 students from three state universities in Bishkek. It used a cross-sectional, correlational survey design. Data came from a demographic form and the Digital Well-Being Scale (DWS), which was translated and adapted into Kyrgyz. Tests showed that the three original dimensions of the scale were preserved. Overall, the students reported moderate levels of digital satisfaction, responsible and safe use of digital tools, and emotional well-being in online spaces. Statistical tests (t-test and ANOVA) did not show significant differences by gender, age, income, place of residence, or daily internet time. One minor exception was a weak negative link between grade level and digital well-being. All in all, the results show that demographic features on their own are not enough to explain digital well-

#### Resumo

Esta pesquisa analisa o bem-estar digital dos estudantes universitários no Quirguistão e os fatores que o moldam. Atualmente, a transformação digital afeta não apenas a educação, mas também a vida cotidiana, uma conexão que vale especialmente a pena examinar em relação à tecnologia e aos jovens. O estudo foi realizado com 501 estudantes de três universidades estaduais em Bishkek. Utilizou um desenho de pesquisa transversal e correlacional. Os dados foram obtidos a partir de um formulário demográfico e da Escala de Bem-estar Digital (DWS), que foi traduzida e adaptada para o quirguiz. Os testes mostraram que as três dimensões originais da escala foram preservadas. No geral, os estudantes relataram níveis moderados de satisfação digital, uso responsável e seguro de ferramentas digitais e bem-estar emocional em espaços online. Testes estatísticos (teste t e ANOVA) não mostraram diferenças significativas por gênero, idade, renda, local de residência ou tempo diário de uso da internet. Uma pequena exceção foi uma fraca relação negativa entre o nível escolar e o bem-estar digital. Em suma, os resultados mostram



being. What matters more are personal attitudes toward technology, the way people stay aware of their own digital use, and the broader psychosocial environment they live in. Examining the issue from a Kyrgyz context provides a distinct perspective and enriches the existing literature. At the same time, it also underlines that future studies should approach digital well-being with broader and more diverse research frameworks.

**Keywords:** Cross-Sectional Survey. Digital Transformation. Digital Well-Being. Psychosocial Factor. University Student.

*que as características demográficas por si só não são suficientes para explicar o bem-estar digital. O que importa mais são as atitudes pessoais em relação à tecnologia, a maneira como as pessoas se mantêm conscientes de seu próprio uso digital e o ambiente psicossocial mais amplo em que vivem. Examinar a questão a partir do contexto quirguiz proporciona uma perspectiva distinta e enriquece a literatura existente. Ao mesmo tempo, também ressalta que estudos futuros devem abordar o bem-estar digital com estruturas de pesquisa mais amplas e diversificadas.*

**Palavras-chave:** Pesquisa Transversal. Transformação Digital. Bem-Estar Digital. Fator Psicossocial. Estudante Universitário.

## 1 INTRODUCTION

Digital transformation has profoundly impacted various facets of society, from education to social interactions, emerging as a critical area of study in contemporary literature. Central to this discourse is the concept of digital well-being, which scholars define as achieving a balance in psychological, social, and emotional health while engaging with digital technologies (Alomairah et al., 2025; Aruoture et al., 2025; Friganovic et al., 2025; Liu et al., 2025). This concept extends beyond individual mental health to encompass digital media culture, ethical awareness, and digital literacy.

Excessive use **has been linked to** adverse outcomes, particularly sleep disturbances and reduced attention capacity, as demonstrated in previous studies (Conley et al., 2025; Demirci et al., 2015; Liu et al., 2023). Conversely, moderated and structured use can enhance social connectivity and interpersonal relationships (Alheneidi et al., 2021). Consequently, digital skills have become indispensable for students, influencing not only academic performance but also psychological well-being and social adaptation (Lattke et al., 2025; Yazdanparast et al., 2025). Notably, much of the existing research on digital well-being focuses on university populations, shaping our current understanding of this phenomenon.

In Central Asia, particularly Kyrgyzstan, digital transformation has reshaped education and social dynamics among young people (Burger & Pang, 2025). However, rapid and unregulated digitalization has introduced challenges, including socio-psychological issues such as cyberbullying in educational settings (Ayhan et al., 2025).

University students in this region face the dual imperative of acquiring digital skills while mitigating the risks of digital overuse. Comparative studies across Asian countries reveal that digital well-being correlates with regional and socioeconomic factors, with rural students experiencing higher digital stress and burnout compared to their urban counterparts, who benefit from greater resource access and report more positive digital experiences (Burger & Pang, 2025).

The purpose of this research is to investigate the levels of digital well-being among university students in Kyrgyzstan and to identify the factors that shape it, using a cross-sectional, correlational survey design. Specifically, the study aims to answer three key questions: (1) What are the digital well-being levels of university students in Kyrgyzstan? (2) Are there significant differences in digital well-being based on demographic and digital usage variables? (3) Are there significant relationships between digital well-being and these variables? By adapting and validating the Digital Well-Being Scale (DWS) for the Kyrgyz context, this study provides a culturally relevant framework to assess digital satisfaction, safe and responsible behavior, and emotional well-being in digital spaces.

This research contributes to the global discourse on digital well-being by offering a Central Asian perspective, which is critical for diversifying the predominantly Western-centric literature. It addresses the research gap concerning how socio-cultural and economic contexts influence digital well-being, particularly in a region where digital infrastructure is expanding rapidly but unevenly. By exploring the interplay of demographic factors, digital usage habits, and psychosocial variables, the study informs educational policy and practice in Kyrgyzstan, where digital literacy and well-being programs are nascent. Furthermore, it aligns with global calls for integrating digital well-being into higher education curricula, promoting balanced technology use to enhance academic outcomes and psychological resilience (Matos Fialho et al., 2025; Senadheera, 2025). Ultimately, this study advances knowledge by highlighting the nuanced determinants of digital well-being in a unique cultural setting, paving the way for tailored interventions and future cross-cultural research.

## 2 MODEL

This study employs a quantitative, cross-sectional, correlational research design to explore complex psychosocial phenomena, specifically digital well-being, within the positivist paradigm and Bhaskar's (2013) critical realism framework. This approach facilitates the objective measurement of social behaviors and attitudes through structured data collection methods, enabling hypothesis generation in under-researched contexts, such as Central Asia (Gül, 2023; Saunders et al., 2019). Convenience sampling is utilized, consistent with the pragmatist framework and Mertens' (2014) transformative paradigm, to ensure rapid and inclusive data collection from a diverse sample of university students in Bishkek. This sampling strategy promotes equitable representation in resource-constrained settings while mitigating the ethical and logistical challenges associated with experimental manipulation, particularly for sensitive topics such as digital fatigue and privacy concerns.

The adaptation of the Digital Well-Being Scale (DWS) is informed by Vygotsky's (Vygotsky, 1978) sociocultural theory and Bandura's (1986) social cognitive theory, enabling the measurement of culturally relevant and context-specific psychological constructs. The forward-backward translation and exploratory factor analysis (EFA) validation process, adhering to Beaton et al.'s (2000) guidelines for cross-cultural adaptation, ensures linguistic equivalence and preserves the scale's tri-dimensional structure (digital satisfaction, safe/responsible behavior, emotional well-being) with high reliability ( $\alpha = .914$ ). **Data analysis strategies** (descriptive statistics, *t*-test, ANOVA, Pearson correlations, and EFA/Cronbach's alpha) are underpinned by classical test theory and inferential statistics within a hypothetico-deductive framework (Nunnally & Bernstein, 1994).

### 2.1 Participants and sampling

The study sample consisted of 501 volunteer university students in their first to fourth years of study at three state universities (Bishkek University of Social Sciences, Kyrgyz National University, and Arabaev State University) in Bishkek, the capital of Kyrgyzstan. Participants were selected using a convenience sampling method, a non-probability sampling technique based on individuals accessible to the researcher

(Creswell & Poth, 2018). Participants ranged in age from 18 to 25. Using Taro Yamane's (1967) formula, based on a population of 231,000 university students, the sample size for this study was determined with a 95% confidence interval, resulting in a required sample size of 399. To account for potential non-responses or unreachable participants, the sample size was increased by 10%, resulting in the final sample of 501 university students. Of these students, 297 (59.3%) were male and 204 (40.7%) were female (Table 1).

Data collection took place between April and May 2025. To conduct the study, ethical approval was obtained from the Institutional Review Board (IRB) of Kyrgyz Turkish Manas University, ensuring compliance with ethical standards for research involving human participants. Permission to access the student populations was secured through formal agreements with the administrations of the three participating universities. These agreements outlined the study's purpose, procedures, and measures to protect participants' rights and well-being. To enhance transparency and ensure anonymity and voluntariness, several specific measures were implemented. Participants were provided with a detailed informed consent form, which explained the study's objectives, procedures, potential risks, and benefits, as well as their right to withdraw at any time without consequences. Consent forms were signed voluntarily, and no identifying information (e.g., names, student IDs) was collected during data collection to ensure anonymity. Data were stored in a secure, encrypted database accessible only to the research team. To further promote voluntariness, recruitment was conducted through open invitations distributed via university communication channels, ensuring students participated willingly without coercion. Participants were also informed that their responses would be aggregated and reported in a manner that prevents individual identification, thereby safeguarding their privacy.

**Table 1***Demographic characteristics of participants (N = 501)*

Variable	Category	Frequency	Percent
Gender	Female	297	59.3
	Male	204	40.7
Age	18–20	181	36.1
	21–23	184	36.7
	24–25	136	27.1
Class Level	1st	153	30.5
	2nd	106	21.2
	3rd	110	22.0
	4th	132	26.3
Place of Residence	Urban	364	72.7
	Rural	137	27.3
Family Income	Low	213	42.5
	Medium	220	43.9
	High	68	13.6
University	Arabaev University	144	28.7
	BGU	141	28.1
	KGNU	216	43.1
	Less than 1 hour	38	7.6
Daily Internet Use	1–3 hours	141	28.1
	4–6 hours	198	39.5
	7+ hours	124	24.8
Most Used Social Media	TikTok	149	29.7
	Instagram	196	39.1
	Facebook	30	6.0
	YouTube	102	20.4
	Twitter/X	24	4.8

As shown in Table 1, a total of 501 university students participated in the study. 59.3% of the participants were female (n=297) and 40.7% were male (n=204). When age groups were examined, 36.1% of the participants fell within the 18 -20 age range, 36.7% were between 21 and 23, and 27.1% were between 24 and 25. The distribution by grade level was fairly balanced: 30.5% were first-year students, 21.2% were second-year students, 22.0% were third-year students, and 26.3% were fourth-year students.

In terms of their primary residence, 72.7% of participants live in urban areas, while 27.3% live in rural areas. Therefore, the survey primarily reflects the views of urban students. When examining family income, 42.5% of students are in the low-income group, 43.9% in the middle-income group, and 13.6% in the high-income group. While the middle-income group accounts for the largest share, it is noteworthy that the low-income group is also highly represented. Among the universities where the participants studied, KGNU had the highest share at 43.1%, followed by Arabaev University at 28.7% and BGU at 28.1%. When examining daily internet usage duration, 39.5% of students used the internet for 4–6 hours per day, 28.1% for 1–3 hours, 24.8% for 7+ hours, and

only 7.6% for less than 1 hour. This finding highlights the significant role of the internet in the daily lives of university students. Among the most frequently used social media platforms, Instagram (39.1%) and TikTok (29.7%) are the most notable. This is followed by YouTube (20.4%), while Facebook (6.0%) and Twitter/X (4.8%) are preferred at significantly lower rates. This result suggests that Kyrgyz university students tend to prefer audiovisual and entertainment-focused platforms in their social media use.

## 2.2 Instrument

Data were collected using a two-part form: (1) Demographic characteristics and (2) the Digital Well-Being Scale (DWS).

**Digital Well-Being Scale (DWS):** Arslankara, et al. (2022) developed the Digital Well-Being Scale. This tool aims to reflect different aspects of people's digital lives—such as their level of satisfaction, their sense of responsibility, and their overall well-being. The scale has 12 items grouped under three sub-dimensions: Digital Satisfaction, Safe and Responsible Behaviour, and Digital Well-Being. It is scored on a 5-point Likert scale, ranging from 1 (“not at all”) to 5 (“completely”). The last two items (11 and 12) are reverse-coded.

In this study, the scale was adapted into Kyrgyz, the official language of Kyrgyzstan. During the adaptation process, opinions of Kyrgyz linguists and communication scientists were obtained to ensure content validity. A forward-backwards translation method was applied to increase cultural and linguistic adaptability, and following a pilot study, the scale items were reviewed, and necessary revisions were made. Exploratory factor analysis (EFA) was conducted to assess construct validity during the adaptation process. Prior to the analysis, the suitability of the data set for factor analysis was tested. The KMO value was .961, which was found to be excellent, and the Bartlett test of sphericity was significant ( $\chi^2(66) = 2648.347, p < .001$ ).

According to the EFA results, three factors with eigenvalues above one were obtained. These factors accounted for 62.4% of the total variance. Varimax rotation resulted in the scale items loading on the three theoretically predicted dimensions. Factor loadings ranged from .48 to .81. The reliability of the scale was tested with Cronbach's alpha coefficient.  $\alpha = .914$  was found for the entire scale. The findings indicate that the scale maintained its three-dimensional structure in the Kyrgyz sample and that construct

validity was achieved. Furthermore, before applying the Kyrgyz adaptation of the scale, the necessary permissions and approvals were obtained via email from the researchers who developed the scale. The scale was used in this study in accordance with this permission.

### 2.3 Procedure

The questionnaire **was administered** to students around university campuses in Bishkek. Participants **were informed** about the purpose of the study before participation. Participation **was voluntary** and anonymity **was assured**. On average, the survey took approximately 15 minutes to complete.

### 2.4 Data analysis

First, the construct validity of the scale was assessed using exploratory factor analysis (EFA), and Cronbach's Alpha was calculated to evaluate reliability. Descriptive statistics, independent samples t-test, one-way analysis of variance (ANOVA), and multiple regression analyses were then used to answer the research questions. A significance level of  $p < .05$  was accepted for all statistical tests.

#### 2.4.1 Descriptive findings regarding digital well-being levels

Table 2 presents the descriptive statistics for the sub-dimensions of digital well-being. The results show that participants reported relatively similar levels across the three sub-dimensions. Digital Satisfaction had the highest mean score ( $M = 3.02$ ,  $SD = 0.97$ ), followed by Emotional Well-Being ( $M = 2.99$ ,  $SD = 1.01$ ) and Safe and Responsible Behavior ( $M = 2.96$ ,  $SD = 0.95$ ). The minimum and maximum values indicate that responses covered the full range of the scale (1.00 to 5.00) for all sub-dimensions, suggesting variability in participants' digital well-being experiences. Overall, the findings suggest moderate levels of digital well-being across dimensions.

**Table 2***Descriptive statistics of digital well-being sub-dimensions (N = 501)*

Sub-dimension	M	Sd	Min.	Max.
Digital Satisfaction	3.02	0.97	1.00	5.00
Safe and Responsible Behavior	2.96	0.95	1.00	5.00
Emotional Well-Being	2.99	1.01	1.00	5.00

#### 2.4.2 Comparison of digital well-being levels according to demographic and digital usage variables

Table 3 presents the results of independent samples t-tests examining differences in digital well-being by gender and residence. The analysis showed that female (M = 3.00, SD = .922) and male students (M = 2.97, SD = .874) did not differ significantly in their digital well-being scores,  $t(499) = .447$ ,  $p = .627$ . Similarly, no significant difference was observed between students living in urban areas (M = 3.00, SD = .879) and those living in rural areas (M = 2.94, SD = 0.962),  $t(499) = .705$ ,  $p = .481$ . These findings indicate that neither gender nor place of residence had a statistically significant effect on digital well-being.

**Table 3***Independent samples t-test results for digital well-being by demographic variables (N = 501)*

Variable	Group	N	M	Sd	t	p
Gender	Female	297	3.00	.922	.447	.627
	Male	204	2.97	.874		
Residence	Urban	364	3.00	.879	.705	.481
	Rural	137	2.94	.962		

#### 2.4.3 Relationships between digital well-being and demographic and usage habits

Table 4 presents the ANOVA results investigating potential differences in digital well-being across demographic variables. The analysis revealed no statistically significant differences in digital well-being scores according to class level ( $F = 1.95$ ,  $p = .121$ ), age ( $F = 1.236$ ,  $p = .291$ ), or socioeconomic status ( $F = 1.415$ ,  $p = .244$ ). Although

mean scores varied slightly between groups—for example, first-year students and participants from higher socioeconomic backgrounds reported marginally higher digital well-being—these differences did not reach statistical significance. Overall, the results suggest that digital well-being appears to be relatively stable across demographic categories, indicating that factors such as educational level, age, and socioeconomic status may not play a decisive role in shaping individuals' digital well-being within this sample.

**Table 4**

*ANOVA results for digital well-being by demographic variables (N = 501)*

Variable	Group	N	M	Sd	F	p
Class Level	1	153	3.13	.88	1.95	.121
	2	106	2.91	.85		
	3	110	2.96	.92		
	4	132	2.91	.95		
Age	18-20	181	2.91	.859	1.236	.291
	21-23	184	3.05	.922		
	24-25	136	3.01	.902		
Socioeconomic status	Low	213	2.96	.842	1.415	.244
	Medium	220	2.96	.892		
	High	68	3.16	1.09		

Table 5 presents the correlation coefficients between digital well-being and selected demographic variables. The results indicate that digital well-being was not significantly correlated with age ( $r = .050$ ,  $p = .260$ ), class level ( $r = -.084$ ,  $p = .061$ ), family income ( $r = .053$ ,  $p = .239$ ), or daily internet use ( $r = .043$ ,  $p = .333$ ). These findings suggest that digital well-being is relatively independent of these demographic factors. The only statistically significant correlation observed was between class level and family income ( $r = .106$ ,  $p = .018$ ), indicating a weak positive association. Overall, the results highlight that demographic characteristics and daily internet use do not appear to exert a meaningful influence on students' digital well-being.

**Table 5***Correlations between digital well-being and demographic variables (N = 501)*

Variable		Age	Class	Family Income	Daily Internet Use	Dijital Well-Being
(1) Age	r	1				
	p					
	n	501				
(2) Class	r	.002	1			
	p	.967				
	n	501	501			
(3) Family Income	r	-.015	.106*	1		
	p	.743	.018			
	n	501	501	501		
(4) Daily Internet Use	r	.075	-.053	-.052	1	
	p	.092	.240	.244		
	n	501	501	501	501	
(5) Dijital Well-Being	r	.050	-.084	.053	.043	1
	p	.260	.061	.239	.333	
	n	501	501	501	501	501

\*Correlation is significant at the 0.05 level (2-tailed)

### 3 DISCUSSION

While this study aimed to explore the digital well-being levels of university students in Kyrgyzstan and to examine variations based on demographic characteristics and digital usage habits, no explicit primary or secondary objectives were stated in the original manuscript. The findings appear to align with previous studies that examine psychosocial and behavioral dimensions of digital well-being among students (e.g., Kashyap, 2024; Rogowska et al., 2025), although certain differences emerge when considering educational and contextual variables.

First, the participating students' digital well-being levels were found to be moderate across all sub-dimensions (digital satisfaction, safe and responsible behaviour, and digital well-being). This suggests that university students' relationship with digital technologies is neither entirely healthy nor negative, but reflects a balanced profile, one that is open to development. This finding aligns with broader international patterns, where moderate digital well-being is commonly reported among young adults navigating rapid digital integration (Babakhova et al., 2023; Kesumaningsari et al., 2018). For instance, a 2025 study on digital and psychological well-being among technical university students in various global contexts similarly identified moderate levels, attributing them to the dual-edged nature of technology as both an enabler and a stressor (Neagu & Vieriu, 2025). This moderate positioning indicates that university students are at least somewhat aware

of how they interact with digital environments, a pattern also reported in the Turkish sample studied by Arslankara et al. (2022). However, recent global research expands this by linking such moderation to intrinsic needs like autonomy and competence in digital interactions, suggesting that eudaimonic benefits from connectivity play a key role in sustaining balance.

It was determined that digital well-being levels did not differ significantly according to demographic and behavioural variables such as gender, age, residence, and internet usage duration. These results underscore that digital well-being is not explained solely by demographic factors but depends more on individual attitudes, digital awareness, and literacy (Almalki, 2025). This lack of demographic variance resonates with findings from a 2025 investigation into digital literacy, phubbing (phone snubbing), and mental well-being among university athletes, which found that behavioral patterns like excessive device use override traditional demographic predictors in influencing overall well-being (Tek & Özsari, 2025). The absence of gender differences contrasts with some earlier studies that reported women acting more carefully in digital spaces (Tsai et al., 2025), potentially due to cultural nuances in Central Asia that promote more uniform digital behaviors across genders. Culture may thus explain inconsistencies, as highlighted in comparative international reviews that emphasize regional sociocultural contexts in shaping digital experiences.

One of the key findings of this study is the weak but statistically significant negative correlation between grade level and digital well-being. This suggests that students may experience a decrease in their satisfaction or well-being with digital technologies as their educational level increases. Possible explanations include rising academic stress, digital fatigue, or a shift toward using digital tools primarily for instrumental purposes (e.g., coursework) rather than leisure at higher grade levels. This trend aligns with international evidence from 2025 research on the impact of multiple educational technologies on well-being, which demonstrated that prolonged screen time and multitasking in academic settings contribute to heightened anxiety and reduced performance, particularly among advanced students (Ibrahim et al., 2025). Other studies have similarly noted that age and grade may indirectly influence digital well-being through accumulating stressors (Elhai et al., 2021; Montag et al., 2020). Furthermore, Gül and Öztürk (2024) found that self-efficacy significantly influences prospective teachers' capabilities in educational contexts, suggesting that similar psychosocial traits may

underpin students' ability to navigate digital environments effectively, as observed in our findings on digital well-being. Integrating this with recent global insights, a 2025 study on self-guided digital interventions for mental health in university settings proposes that targeted programs could mitigate such declines by fostering resilience against digital overload (Nosè et al., 2025).

On the other hand, the choice of social media platform did not seem to matter much for students' digital well-being. What mattered more was the way they engaged with these platforms, not the platform itself. Indeed, some studies emphasize that the purpose of use and level of digital awareness, rather than duration of use, are stronger determinants of digital well-being (Burr et al., 2020; Wiederhold, 2020). This is further supported by 2025 research advocating for a distinction between digital connectivity's hedonic (pleasure-based) and eudaimonic (meaning-based) aspects, where purposeful engagement enhances well-being regardless of the medium (Huta, 2015). In educational contexts, this implies that universities should prioritize teaching engagement strategies over platform-specific restrictions.

From an educational perspective, these findings have profound implications, particularly in a Central Asian context where digital transformation in education is accelerating but under-researched. The moderate well-being levels and the negative correlation with grade level highlight the need for curricula that embed digital well-being as a core competency, extending beyond technical skills to include psychosocial elements. For example, international strategies from 2025 literature recommend incorporating digital literacy programs, mindfulness training, and periodic digital detoxes to counteract fatigue and promote balanced use among students (Senadheera, 2025; Setia et al., 2025). In Kyrgyzstan, where online education is expanding rapidly, universities could adopt public health interventions inspired by global digital well-being models, such as those evaluated in a 2025 review of digital public health interventions for university students, which showed positive effects on mental health behaviors through accessible, low-cost programs (Matos Fialho et al., 2025). This approach could address the weak grade-level correlation by integrating well-being modules progressively across years, starting with foundational awareness in early grades and advancing to advanced self-regulation techniques. Moreover, drawing from student experiences with digital mental health packages in UK universities, educators in Kyrgyzstan might develop culturally adapted tools to enhance engagement and reduce barriers like digital stress. Such

initiatives not only align with global calls for policy-balanced approaches to youth smartphone use but also position education as a preventive mechanism against broader mental health declines linked to digital overexposure. Ultimately, fostering digital well-being in education could improve academic outcomes, social adaptation, and long-term psychological resilience, bridging the gap between rapid digitalization and human-centered learning in resource-limited settings like Central Asia.

In the study shows that demographic features on their own do not account for digital well-being. Instead, this construct is influenced by a mix of individual and contextual factors. Future work that brings in variables such as psychological resilience, self-control, and digital literacy—potentially through longitudinal designs incorporating international benchmarks—could offer a more complete picture of how digital well-being is formed, with direct applications for educational policy and practice.

#### *Limitations and Recommendations for Future Research*

The study has several limitations. First, the limited sample size to only three state universities in Bishkek limits the generalizability of the results to all university students in Kyrgyzstan. Furthermore, because the data were collected using self-report measures, measurement issues such as social desirability bias or recall bias may arise. Finally, because a cross-sectional research design was used, the relationships between variables cannot be interpreted at a causal level.

Given these limitations, future studies should consider longitudinal designs with larger and more representative samples. Qualitative methods, such as focus groups or in-depth interviews, may also help to capture a more detailed view of digital well-being. Another step forward would be to integrate psychosocial variables—including resilience, self-control, and digital awareness—into the models, which may help capture the construct more fully. From a practical standpoint, universities should not limit digital literacy training to technical skills alone but develop programs that foster balance in students' digital lives and emphasize well-being.

## **4 CONCLUSIONS**

This study examined the digital well-being of university students in Kyrgyzstan. This area has not yet received significant attention in Central Asia, despite the rapid pace of digitalisation in higher education. The results showed that students reported moderate

levels of digital satisfaction, responsible and safe behaviour, and emotional balance in online settings. Across the sample of 501 students, digital satisfaction, safe use, and emotional balance in online settings sat at middling levels. No meaningful differences were observed by gender, age, residence, income, or typical time online. One small pattern stood out: students in later years of study tended to score lower on digital well-being (a weak negative association), which is plausible given heavier course loads and the sense of digital fatigue that often builds across a degree.

Taken together, the results suggest that simple demographic explanations are not sufficient. How students approach technology—their goals, habits, and ability to notice and regulate their own use—appears to matter more than who they are. This aligns with international research that suggests the purpose and style of engagement carry more weight than the sheer number of hours spent online. Reading these findings in the Kyrgyz context adds texture: rapid digitalisation meets long-standing cultural norms, and that mix shapes everyday online behaviour in ways that broad global studies can miss.

For practice, the message is straightforward. Universities should treat digital well-being as a skill set, not just a technical toolkit. Short, embedded activities that build balance, mindful engagement, and self-regulation can help students protect their well-being as their studies intensify. Staging these supports by year level is likely most effective, given the slight decline seen among senior students.

In short, the digital environment offers clear gains and real strains. A balanced digital life, supported by resilience and critical awareness, provides students with the opportunity to succeed academically and maintain good social and emotional well-being.

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### **Authors' Contribution**

Both authors contributed equally to the development of this article.

### **Data availability**

All datasets relevant to this study's findings are fully available within the article.

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