Journal of Social Sciences and Media Studies (JOSSAMS) Volume 7, Issue 2, 2023
ISSN: 2518-8046

How Technology Transforms Students: Unpacking its Influence on Daily Life, Academic Learning, Social Bonds, and Mental Wellness

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Abstract
This extensive study centered on the impact of technology, particularly digital devices, on contemporary society, with a special focus on university students. Participants (N=205) were selected through a simple random sampling with no age limit and gender biasness. It reveals that spending extended hours on digital devices lead to addiction and create sleep disruption. A complex relationship between technology and interpersonal interactions was found in fewer face-to-face encounters with family and friends. Furthermore, technology is reshaping students' learning experiences; a shift towards digital resources and feedback methods was observed, that have both positive & negative effects on teacher-student interactions and academic engagement. Besides all of these consequences, this addiction of technology significantly affects students' mental well-being, with most reporting negative impacts. The study suggested critical recommendations, such as teaching digital literacy, fostering communication, mental health awareness programs, and responsible use of AI in academic settings.

Keywords: Technology, Digital Devices, University Students, Mental Health & Well-being, Academic Learning, Interpersonal Relationships, Social Interactions, Family, Friends, Teachers.

Introduction

In recent years, technology has transformed the way we live, interact, and communicate with the people around us and world widely in seconds. These digital devices have become indispensable and obligatory tools in our daily routines, such as mobiles, other smartphones, tablets, and laptops etc. In this increasing integration era of technology in our daily lives, it's more essential to understand how these changes affect various aspects of our lives, existence, particularly among the younger generations, who have grown up in this digital time. The current research seeks to discover the multifaceted effects of technology, predominantly digital devices and social media, on various aspects of individuals' lives, with a particular focus on future generation, especially investigated their habits of device usage, the influence of technology on personal relationships, the role of social media in shaping their self-perception, the depth of their conversations, and how these technologies extend into educational settings. The study further investigated the implications of technology on the student-teacher & parents-children relationship, and inspected the responsibilities of parents in managing their children's digital behaviors and activities. The study provided a comprehensive understanding of how technology is shaping and reforming our lives, from family dynamics to academic experiences, and how these individuals perceive different changes in their lives.

Usage & Habits of Digital Device

Technology in today's world becomes more omnipresent, our dependence on digital devices has grown considerably. People all around the world, especially the young generation, find themselves using smartphones for several hours each day (Martin et al., 2020; Mackare, K., & Jansone, A., 2018), engaging in a wide range of activities from browsing social media or through digital communication apps such as Whatsapp, Facebook, etc. these devices and apps transformed the way we connect with the world, these applications enable instant communication regardless of geographical distance (Sudirjo et al., 2023; Liu et al., 2020; Lopez-Fernandez et al., 2018). The daily screen time of individuals often exceeded to several hours, raising questions about potential addiction and overuse vs. misuse (see also Fullan, 2023; Hale et al., 2018; Moulin, 2015). Many of the individuals admitted to carrying their mobile or smartphone with them at all times (Karaoglan et al., 2023; Lepp et al., 2015), which has now become a norm in modern society. Use of mobile or smartphone, for both educational and recreational purpose, has raised alarm about potential addiction and the psychological effects of prolonged screen time in their overall lives such as sleep pattern (Maftei, A., & Merlici, I. A., 2023; Hale et al., 2018; Mackare, K., & Jansone, A., 2018).

Impact on Personal Relationships

One of the most significant concern about technology and its impact on the personality is that technology has left its mark is in personal relationships (Shi et al., 2023; Liu et al., 2020) either parents-child relation or teacher-student relation. Researchers Lepp et al. (2015) demonstrated that while technology enables instant and easy way of communication, it had adverse effects on the quality of personal relationships. Some scholars argued that excessive use of technology may lead to a decline in face-to-face interactions with family members, including parents, siblings, peers, and others (see also Liu et al., 2020; Mahapatra, 2019; Sergi et al., 2017). Additionally, conflicts and misunderstandings between peers stemming from online communication have been reported, affecting their relationships (Camacho et al., 2012).

Digital Device Usage in Educational Settings

The influence of technology has been extended in our educational environment, where students are commonly using these digital devices for academic purposes, both inside and outside of the classroom (Martin et al., 2020). These mainly include searching educational materials, assignments, research, and communicate with their teachers and peers on given educational tasks (Shi et al., 2023; Mackare, K., & Jansone, A., 2018). Different studies showed that students are not availing library services for searching books and notes; they are using mobile or laptop to search relevant material for their study that reduced the habit of reading books (see Sudirjo et al., 2023; Yu et al., 2022; Parsons & Adhikar, 2016). Similarly, digital feedback methods by teachers have also become prevalent, potentially altering how students understand and implement teacher feedback. After the pandemic period, digital modes of assessment feedback, particularly digital recordings and from assignment submission to online marking are more common ways in education system (Ryan et al., 2019). Moreover, the role of teachers has changed, with technology enabling new forms of interaction and collaboration among students (Li et al., 2019) that negatively impact the teacher-student interaction (Fullan, 2023; Shi et al., 2023; Drigas et al., 2015).

Digital Device and Mental Health of Students

The impact of technology on the mental health of students has become a prominent concern in recent years, including smartphones, laptops, and tablets. As these devices continued to permeate all aspects of academic and social life, questions arise about their effects on students' mental health and well-being (see also Shi et al., 2023; Bucci et al., 2019; Zapor et al., 2017). Though these digital devices offered different educational benefits and connectivity, they also introduced multiple challenges related to addiction, social comparison, academic stress, feelings of isolation, detached from family members, etc (Maftei, A., & Merlici, I. A., 2023; Fullan, 2023; Yaday & Reddy, 2023; Lattie et al., 2019). Researcher Alismaiel (2023) mentioned that technology has some positive and negative impacts on the mental health & well-being of any individuals, especially in young generations. Technology, on the positive side, increased access to educational resources, facilitates communication & collaboration, and offers flexibility for balancing academic activities with other commitments. On the other hand, negative effects of technology includes addiction, disrupted sleep patterns due to excessive screen time, social isolation, and the pressure for constant connectivity, which can lead to anxiety, exhaustion, and stress among future generation (Rehman et al., 2022). For maintaining a good mental health and wellbeing in the digital age attaining a healthy balance in the use of technology and digital mindfulness is important (Alismaiel, 2023; Pang et al., 2023; Bucci et al., 2019; Mahapatra, 2019).

Furthermore**,** social media platforms have redefined how individuals perceive others and present themselves in-front of others. The pressure to maintain a curated online image often leads to a gap between the real self-identity and showed personality (online); they camouflage themselves (Rehman et al., 2022). Researcher Compton-Lilly (2006) highlighted that individuals often curate their online personas, presenting an idealized version of themselves instead of their real personality. This act of hiding their true identity cause psychological distress and negatively impact on their lives (Zhao & Song, 2022; Liu et al., 2020). This digital identity encompasses numerous perceptions of oneself and others that mostly developed through multiple online activities and with the influence of social media. It not only represents their knowledge but their social connections too, which can lead to mental exhaustion. Furthermore, the online actions of students are influenced by their concerns about how others perceive them (Camacho et al., 2012). They involved in different online activities and engaged in posting, liking, & sharing content because they concerned about how others perceive their digital personas, so this kind of digital activities give them stress and mental fatigue (Sudirjo et al., 2023; Salas-Pilco et al., 2022; Camacho et al., 2012).

Objectives

1. To analyze how young individuals utilize digital devices in their daily lives.
2. To assess the influence of technology on face-to-face interactions.
3. To investigate the use of technology by students in their educational settings.
4. To explore the impact of technology on students mental well-being.

Theoretical and Implications of the Study

While the current study offers valuable insights into the multifaceted impacts of technology on university students, it's crucial to acknowledge the existing theoretical frameworks in this field and where this study contributes or identifies study gaps. Numerous theoretical lenses propose valuable perspectives to understand the influence of technology on individual's behavior, cognition, and social interactions. These theoretical lenses includes; technological determinism, uses and gratifications theory, and social cognitive theory. Though, the study reveals several uncharted realms within these frameworks. For example, there is substantial literature found that focused on the negative impact of technology on mental health & well-being, the data lacks a complete understanding concerning the niceties of digital identity formation and its relation with mental health.

The study's practical implications are essential and substantial in guiding interventions and efforts in policy-making. The study findings emphasized the need for healthy and comprehensive awareness programs on digital literacy and mental health initiatives targeting university students. These awareness programs should emphasize the responsible use of digital technologies, fostering meaningful offline interactions among individuals, and educating individuals about the psychological impacts of their online actions on their personalities.

Additionally, universities, institutions, and educators must adapt their teaching-learning methodologies to align with the technological landscape. That not only entails integrating practices that foster digital mindfulness and teach critical digital presence management, but also demonstrate how these digital technologies can aid learning without compromising mental health.

In spite of the substantial research, still notable gaps remain that require further investigation in the field of technology. This research study highlights the need to explore the nuanced effects of different types of digital devices on various aspects of students' lives and well-being. Moreover, the study specifically focused on university students only, there's a dearth of research concerning the impact of digital technology on different age groups such as younger age and older adults, demanding future investigations to understand technology's influence across different demographics comprehensively including age, gender, culture, etc.

Although, the research gap between theoretical understanding and practical implementation is apparent in the existing literature. Nevertheless, theories provide frameworks to understand technology's impact, the practical applications, implementations, and interventions are yet to fully integrate these theoretical underpinnings effectively. Bridging this gap requires a intensive effort to translate theoretical insights into practical or actionable strategies for individuals, educators, families, and policymakers.

Research Methodology

This quantitative study employed a cross-sectional research design, aiming to collect data at a single point in time. Targeted population was young individuals (university students, N=205), selected through a simple random sampling method, aged 17 years and above, no gender and geographical distribution (see table 1).

Structured close-ended questionnaire (54 items) was developed based on objectives and used with the 3-point Likert scale in addition to demographic information. Reliability of the tool was calculated after a pilot testing on 30 students and Cronbach's alpha was measured .778. Furthermore, Warwick Edinburgh Mental Well-being Scale (WEMWBS-14 items) was used with permission to explore the mental health of students. Data was collected electronically through online surveys form which was analyzed with the help of statistical software (SPSS). General descriptive & non-parametric tests were applied to measure the objectives of this study.

Table 1.
Demographic Characteristics

		N (205)	M	SD
Gender			1.42	.495
	Male	118 (57.6%)		
	Female	87 (42.2%)		
Age			3.24	.450
	15 – 18	1 (.5%)		
	19 – 22	155 (75.6%)		
	23 – 26	48 (23.4%)		
	27 – 30	1 (.5%)		
Marital Status			1.98	.155
	Married	5 (2.4%)		
	Unmarried	200 (97.6%)		
Education			3.75	.581
	Ph.D.	3 (1.5%)		
	M.Phil.	6 (2.9%)		
	Masters	31 (15.1%)		
	Honors	165 (80.5%)		

Findings

Objective 1: To analyze how young individuals utilize digital devices in their daily lives

Table 2 represents valuable insights into the daily utilization of digital devices by university students. In their daily routines, the majority of students (74.1%) primarily used 'smartphones,' followed by 6.3% who used laptops, 4.4% who preferred desktop computers, and 13.7% who utilized all of the mentioned devices. The mean score was observed 1.66 with standard deviation 1.387. However, the most common usage of these digital devices was social media platforms (50.7%) like Facebook, Whatsapp, Snap-chat, or Instagram, for the gaming purpose (7.8%), while for assignment searching (1.5%) and TikTok videos (1%). Interestingly, 38.5% reported that they used their devices for all of the above activities, highlighting the versatility and adaptability of these devices in their daily life. The data also explored the students' daily screen time, revealing that 29.8% spent 8 to 10 hours, 23.9% spent more than 11 hours, while 20% were using their mobile for 4 to 6 hours in a day, this data raise genuine concerns for the future of our new generation. However, when it came to their reactions to a completely drained or damaged device battery, mostly students (51.7%) indicated that they would put their phone on charging and go for repairing option at the same time, while 34.1% stated that it would affect their mood, making them feel frustrated. Though, few students (14.1%) mentioned that they would continue to use their device or phone while it's charging or immediately go for repairs.

Table 2.
Daily Utilization of Digital Devices

	N	%	M	SD
Digital devices mostly used in your daily routine,			1.66	1.387
Smart Phone	152	74.1		
Laptop	13	6.3		
Desktop Computer	9	4.4		
Tablet	3	1.5		
All of the above	28	13.7		
The most common usage of your digital device			4.21	2.473
Gaming	16	7.8		
Facebook / Whatsapp / Snap-chat / Instagram	104	50.7		
Assignment Searching	3	1.5		
Tic-Toc Videos	2	1.0		
Emails	1	.5		
All of the above	79	38.5		
Daily Screen Time			4.39	1.319
Less than an hour	4	2.0		
2 to 4 hours	13	6.3		
4 to 6 hours	41	20.0		
6 to 8 hours	37	18.0		
8 to 10 hours	61	29.8		
more than 11 hours	49	23.9		
Reaction on; when your device's battery had completely drained or damaged.			2.04	.740
My mood will be off and frustrated	70	34.1		
Nothing will happen, I will just put my phone on charging and go for repairing	106	51.7		
I will use the phone while charging, or go for repairing at the spot	29	14.1		

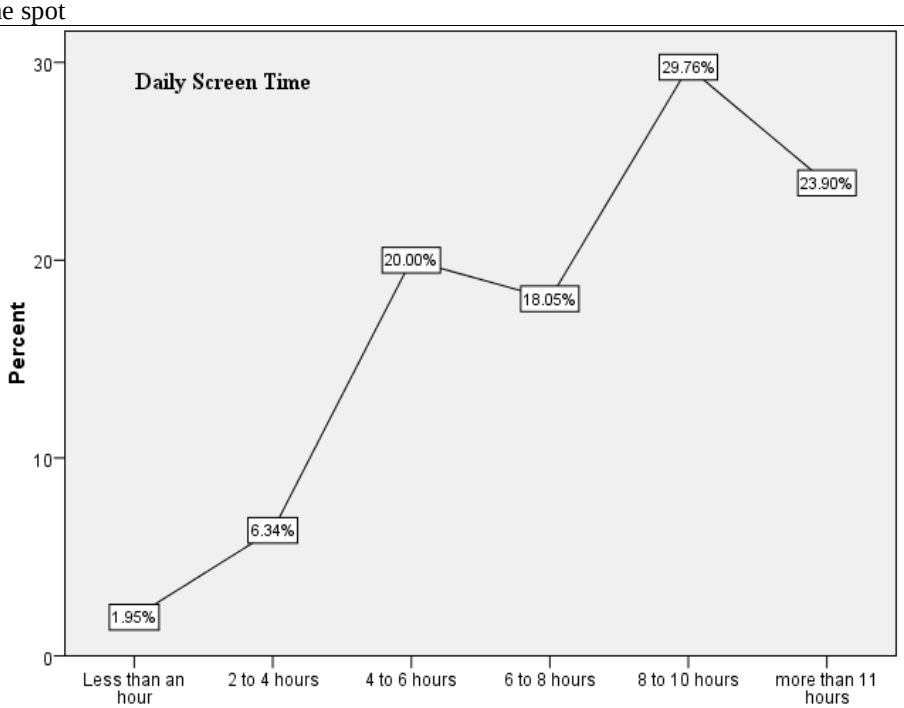

Fig. 1 illustrate the daily screen time of university students

The utilization of digital devices in various scenarios by university students can be seen in Table 3. Particularly, the majority of the participated students (44.9%) reported to some extent and 35.1% were agreed for the usage of these digital

devices for non-educational purposes during class timings. While 45.4% used their devices at bedtime and substantial 40.5% kept their mobile devices nearby at all times. When asked for the device addiction, majority participants (44.4%) considered themselves addicted, with an additional 34.1% feeling addicted to some extent to their mobile.

Table 3.
Utilization of Digital Devices

	Yes	No	To some extent	M	SD
Use of a digital device for non-educational purposes during your study/class time.	72 (35.1%)	41 (20%)	92 (44.9%)	2.05	.927
Usage of a digital device (mobile, tablet, or laptop) at bedtime, before sleep	93 (45.4%)	79 (38.5%)	33 (16.1%)	1.78	.805
Do you always keep your mobile device with you or nearby to you?	83 (40.5%)	48 (23.4%)	74 (36.1%)	1.81	.893
Are you addicted to your mobile or devices?	91 (44.4%)	44 (21.5%)	70 (34.1%)	1.87	.918

Objective 2: To assess the influence of technology on face-to-face interactions & relationships
The study provides a comprehensive view of the relationship between technology and interpersonal interactions (see table 4), including living arrangements and responses to message notifications on mobile. The data reveals that a significant proportion of students share their bedrooms with siblings (61.5%), and some report positive (22.4%) or negative (29.3%) impacts of technology on these sibling interactions. Additionally, differing emotional reactions were observed when comparing responses to message notifications from siblings and friends. Excitement is more pronounced when the messages are from friends (57.6%) compared to siblings (1.0%), additionally, annoyance is higher when messages come from siblings (33.7%) compared to friends (11.7%).

Table 4.
Technology and Interactions with others

	N	%	M	SD
Do you have a separate bedroom, or sharing with someone?			2.24	1.126
Separate Bedroom	72	35.1		
Sharing with Siblings	126	61.5		
Sharing with Friends	7	3.4		
Use of technology and social media has affected your interactions with your siblings (in what ways?)			2.67	1.334
Yes. Positively	46	22.4		
Yes, Negatively	60	29.3		
No	54	26.3		
Siblings are also engaging in their own devices,	34	16.6		
I don't have siblings	11	5.4		
Received message notification - from parents/siblings			2.76	.656
Excited	2	1.0		
Annoyed	69	33.7		
Indifferent	111	54.1		
Anxious	23	11.2		
Received message notification - from friends			1.74	.922
Excited	118	57.6		
Annoyed	24	11.7		
Indifferent	61	29.8		
Anxious	2	1.0		

The outcomes from Table 5 disclose that majority participants reported that excessive use of digital devices and social media has had a substantial impact on their interpersonal relationships. A significant proportion felt that it led to less face-to-face interactions with parents & siblings, reduced quality of time with family members, and a shift towards using digital devices for communication. Moreover, technology usage sometimes resulted in feelings of being left out of social

activities and conflicts with siblings/friends. The results suggest that influence of technology on family and peer relationship is a complex and multifaceted issue.

Table 5.
Descriptive Statistics of Technology's Impact on Interactions with Family and Peers

Statements	Yes	No	To some extent	M	SD
Digital devices and social media, excessive use led to fewer face-to-face interactions with your parents.	45 (22%)	68 (33.2%)	92 (44.9%)	2.23	.787
Increased use of technology and social media has affected the interactions with siblings	97 (47.3%)	60 (29.3%)	48 (23.4%)	1.76	.808
More suitable way to communicate with your parents/friends/peers/teacher is through digital devices (mobile) rather than in-person conversations	57 (27.8%)	56 (27.3%)	92 (44.9%)	2.17	.837
Do you miss the valuable time with your parents/siblings due to spending time on technology/social media?	35 (17.1%)	103 (50.2%)	67 (32.7%)	2.16	.837
The use of technology has replaced or reduced the time you spend engaging in activities with your siblings	63 (30.7%)	54 (26.3%)	88 (42.9%)	2.12	.852
Use of social media or apps to communicate with parents or peers instead of face-to-face conversations	47 (22.9%)	70 (34.1%)	88 (42.9%)	2.20	.788
Have you ever felt left out of social activities? (because you didn't keep up with your peers' online interactions)	31 (15.1%)	42 (20.5%)	132 (64.4%)	2.49	.745
Use of technology & social media by your parents has impacted the amount of quality time you spend together	75 (36.6%)	102 (49.8%)	28 (13.7%)	1.77	.672
Technology device or social media has made it easier way to share thoughts & experiences with your parents	124 (60.5%)	78 (38%)	3 (1.5%)	1.41	.522
You & your siblings are frequently engaged in online/media activities together that involve technology	77 (37.6%)	49 (23.9%)	79 (38.5%)	2.01	.874
Technology and social media has created more opportunities for bonding/shared interests among your siblings/friends	104 (50.7%)	32 (15.6%)	69 (33.7%)	1.83	.905
The use of technology has led to more conflicts or arguments with your siblings/friends	49 (23.9%)	104 (50.7%)	52 (25.4%)	2.01	.703
Technology usage has influenced the depth of your conversations with your parents/siblings or others	133 (64.9%)	69 (33.7%)	3 (1.5%)	1.37	.512
Do you have meaningful face to face conversations with your friends	54 (26.3%)	97 (47.3%)	54 (26.3%)	2.00	.728
Do you have meaningful face to face conversations with your siblings? (N = 191)	52 (25.4%)	103 (50.2%)	36 (17.6)	2.06	.838
Do you have meaningful face to face conversations with your Parents	49 (23.9%)	98 (47.8%)	58 (28.3%)	2.04	.723

Table 6 below presents the result of the Wilcoxon signed ranks test that indicates a significant negative effect of technology usage on relationships with z values -12.420 (p=.000). The negative ranks far outnumber the positive ranks, implying that, on average, participated students felt that technology had a detrimental impact on their relationships with family and friends.

Table 6.
Wilcoxon signed ranks test for the effect of technology usage on relationships

	Negative Ranks	Positive Ranks	Ties	Z	Asymp. Sig. (2-tailed)
N	205[a]	0[b]	0[c]	-12.420[d]	.000
Mean Rank	103.00	.00			
Sum of Ranks	21115.00	.00			

a. Technology Usage < Relationship
b. Technology Usage > Relationship
c. Technology Usage = Relationship
d. Based on positive ranks.

Objective 3: To investigate the use of technology by students in their educational settings
The data in the table 7 revealed that students engaged in various digital activities during class, including Whatsapp chatting, note-taking, searching for relevant topics, using social media, etc. However, it is noteworthy that a significant proportion of participated students prefer in-person interactions with teachers, though a considerable number also find digital interactions equally effective. Moreover, a notable percentage of students received feedback from teachers through both digital and in-person interactions as equally effective for the feedback purpose.

Table 7.
Use of Digital Technologies in Educational Settings

	N	%	M	SD
What digital activities, do you commonly perform during class			3.51	2.045
Note-taking	42	20.5		
Searching relevant topics	53	25.9		
On the phone calls	14	6.8		
Emailing	4	2.0		
Whatsapp / Facebook / Instagram / Twitter	59	28.8		
Making Assignments	17	8.3		
Just exploring because of no interest in lecture	12	5.9		
Other	4	2.0		
Do you think of interacting with your teachers through digital channels compared to the in-person interactions?			2.20	.708
I prefer digital interactions	35	17.1		
I prefer in-person interaction	95	46.3		
I find both equally effective	75	36.6		
Do you receive feedback from teachers on your assignments / classwork through			2.09	.841
Digital interaction (Whatsapp chats etc.)	64	31.2		
In-person Interaction	59	28.8		
Both equally effective	82	40.0		

Table 8 provides insight into how students engaged with digital technologies in educational settings and their perceptions of the impact of technology. However, a significant portion of students used digital devices during classes and found digital feedback methods more effective. They also observed changes in interactions between teacher & student due to the use of technology in the classroom. On the other hand, many students collaborated with peers using digital tools and believed that technology enhances their interactions for educational group activities. However, there were varied opinions on technology's effects on respect for teachers, peer or other relationships. Students were aware of the distractions that technology poses in their learning process, but they also knew that it is convenience for them for communication and collaboration. Moreover, in this current era, students are mostly relying on AI for multiple purposes such as making assignments to casual chats, and signaling their openness to AI's role in daily life.

Table 8.
Digital Technologies and its' usage in Educational Settings

Do you:	Yes	No	To some extent	M	SD
use digital devices during the classroom?	43 (21%)	73 (35.6%)	89 (43.4%)	2.22	.772
think that digital feedback methods impact your ability to understand and implement teacher feedback effectively?	79 (38.5%)	69 (33.7%)	57 (27.8%)	1.89	.809
perceived any changes in the way teachers interact with students due to technology use in the classroom?	75 (36.6)	52 (25.4%)	78 (38%)	2.01	.866
collaborate with your peers on academic projects or assignments using digital tools?	31 (15.1%)	112 (54.6%)	62 (30.2%)	2.15	.658
think that technology affects your interactions with classmates during group activities or discussions?	119 (58%)	45 (22%)	41 (20%)	1.62	.799
think that your digital habits affect your level of engagement with the teacher's instruction?	51 (24.9%)	89 (43.4%)	65 (31.7%)	2.07	.751
digital distractions impact your ability to retain information from class?	80 (39%)	34 (16.6%)	91 (44.4%)	2.05	.914
think the use of personal mobile phone by teachers in the classroom affects your learning experience?	53 (25.9%)	65 (31.7%)	87 (42.4%)	2.17	.812
feel that the use of any digital technologies by teachers in the classroom affects your learning experience & engagement?	85 (41.5%)	74 (36.1%)	46 (22.4%)	1.81	.778
you received any rules or guidelines by teachers, about using technology during class?	148 (72%)	54 (26.3%)	3 (1.5%)	1.29	.487
feel that technology impacts the quality of peer collaboration in academic tasks?	117 (57%)	51 (24.9%)	37 (18%)	1.61	.776
feel, the use of technology during the classroom impacts your level of focus & engagement with the teacher's instruction?	68 (33.2%)	78 (38%)	59 (28.8%)	1.96	.788
think the use of technology during class affects your level of respect for teachers?	78 (38%)	69 (33.7%)	58 (28.3%)	1.90	.811
perceived any changes in the way students treat teachers due to digital distractions during class?	68 (33.2%)	71 (34.6%)	66 (32.2%)	1.99	.810
think that Digital distractions impact students' respect towards teachers	62 (30.2%)	60 (29.3%)	83 (40.5%)	2.10	.837
think you have established a positive & respectful relationship with your teachers?	85 (41.5%)	50 (24.4%)	70 (34.1%)	1.93	.869
perceive extensive use of technology outside of educational purposes impacts your overall attitude towards education?	85 (41.5%)	84 (41%)	36 (17.6%)	2.28	.725
experience of misunderstandings or conflicts with friends/siblings due to online communication	90 (43.9%)	68 (33.2%)	47 (22.9%)	1.79	.792
feel an engagement with mobile devices affects your ability to manage time effectively for university work/activities?	88 (42.9%)	32 (15.6%)	85 (41.5%)	1.99	.921

use AI Software or apps for making assignments	121 (59%)	37 (18%)	47 (22.9%)	1.64	.832
use AI based platforms for just chit chats (for the time pass purpose)	46 (22.4%)	64 (31.2%)	95 (46.3%)	2.24	.796
prefer to chat with AI during your family time	47 (22.9%)	72 (35.1%)	86 (42%)	2.19	.785
prefer to solve your problems through AI instead of communicating with parents?	50 (24.4%)	66 (32.2%)	89 (43.4%)	2.19	.803

Objective 4: To explore the impact of technology on students' mental well-being

Table 9 represents the results from a Wilcoxon signed ranks test comparing technology usage and its impact on students' mental well-being. The majority of the participated students (197) believed that technology negatively affected their mental health & well-being, while very few (6) felt it had a positive impact. However, only two participated students had mixed feelings. The test showed a highly significant difference (p=.000), indicating a consensus among participants that technology has a negative influence on their mental health & well-being.

Table 9.

Wilcoxon signed ranks test for the impact of technology on students' mental well-being

	Negative Ranks	Positive Ranks	Ties	Z	Asymp. Sig. (2-tailed)
N	197[a]	6[b]	2[c]	-12.237[d]	.000
Mean Rank	104.58	17.42			
Sum of Ranks	20601.50	104.50			

a. Technology Usage < MWB
b. Technology Usage > MWB
c. Technology Usage = MWB
d. Based on positive ranks.

Discussion

This study aimed to explore the multifaceted effects of technology, particularly digital devices such as mobile and social media, on various aspects of individuals' lives, specially focused on university students as our future generation. The findings revealed the valuable insights into the integration of technology into the daily lives of university students and its multifaceted effect on interpersonal relationships, their self-identity, in educational settings, and their own mental health & well-being (see also Karaoglan et al., 2023; Yao & Wang, 2023; Zhao & Song, 2022; Lim & Kim, 2018).

The current study found that almost all university students extensively use digital devices, primarily smartphones, in their daily routines for various activities, including social media engagement, gaming, and academic work (Maftei, A., & Merlici, I. A., 2023; Mahapatra, 2019; Lopez-Fernandez et al., 2018). Notably, a significant proportion of students reported spending long hours on their devices, which raises concerns about potential addiction and its impact on sleep patterns, comparable findings were also observed by researchers Yao & Wang (2023) and Hale et al. (2018). Similarly, researcher Moulin (2015) investigated the impact of evening media use on healthy sleep patterns and its potential connection to academic success among high school students and reported a prevalent habit of using digital devices in bed time that create disturbance in their sleep patterns and directly or indirectly effect on their academic performance. Furthermore, the students' build a strong attachment to their devices; they can't share or accept any issue regarding their device such as battery issues or any damage (see also Yu et al., 2022). These findings reflect the omnipresence of digital devices in the lives of young individuals especially university students (Karaoglan et al., 2023; Mosalanejad et al., 2019; Mackare, K., & Jansone, A., 2018).

While technology facilitates instant communication regardless of time and location, it has adverse effects on the quality of personal relationships (see Lim & Kim, 2018; Sergi et al., 2017; Lepp et al., 2015). As per the findings, the use of excessive technology is associated with fewer face-to-face interactions with parents, siblings, peers, and others (Shi et al., 2023). According to Alismaiel (2023), conflicts and misunderstandings stemming from online communication reported by students, affect their interpersonal relationships with family and friends. Additionally, the pressure to maintain a curated online image on social media platforms led to a gap between online personas and real self-identity (Camacho

et al., 2012), causing psychological distress (see related articles Shi et al., 2023; Pang et al., 2023; Mosalanejad et al., 2019; Moulin, 2015). Though, the study findings highlighted the need to strike a balance between online and offline interactions to preserve healthy relationships.

On the other hand, technology has influenced into educational settings, where students commonly use digital devices for academic purposes and discussions, such as searching educational materials, assignments, research, and communication with teachers and peers. The shift from traditional library services to digital resources is notable, raising concerns about reduced engagement with physical books (Lopez-Fernandez et al., 2018). Moreover, digital feedback methods among university students and teachers are becoming more prevalent, potentially altering how students interpret and implement teacher feedback (Alismaiel, 2023). However, this shift has led to changes in teacher-student interactions, which may have either positive or negative consequences in their lives (Maftei, A., & Merlici, I. A., 2023; Harper, 2018). Furthermore, technology usage has a negative impact on the mental well-being of these individuals (see Pang et al., 2023; Lopez-Fernandez et al., 2018; Lepp et al., 2015). Mental well-being of these university students were found low on WEMWBS, the results were clear that they were addicted to their device, due to that they faced sleeping issues, frustrated when found their device battery low, annoyed their parents or siblings, they avoided in-person interaction with others, etc. Moreover, students expressed concerns about digital distractions affecting their ability to retain information from classes and have weak bounding and interaction with peers and teachers. It's an alarming condition for our future generation. The increasing use of technology outside educational purposes also influenced their overall attitude towards education (see also Zhao & Song, 2022; Martin et al., 2020; Bucci et al., 2019; Lepp et al., 2015). This highlights the need for strategies to mitigate the contrary effects of technology on students' academic engagement and mental health & well-being.

Conclusion

The findings of the current study provide a wide-ranging understanding of how technology influence on various aspects of individuals' own lives, from interpersonal relationships to their academic experiences. University students have not only integrated to digital devices in their lives but they have addicted to it especially smart phones into their daily routines. That negatively affect with notable implications for their personal relationships and mental well-being. The study stressed and emphasized the need for responsible technology usage and importance is given on striking a balance between online & offline interactions with others. The findings suggests that there is a need to develop strategies and interventions to help students maintain a healthy balance in their daily technology usage; includes raising awareness about the potential negative consequences of excessive technology usage, promoting meaningful face-to-face interactions, and providing guidance on digital mindfulness and usage in the classroom. Additionally, there is a need to adapt the changing landscape of technology in education, emphasizing the positive aspects while mitigating potential drawbacks, by educators and universities.

Furthermost, a good and stable mental health & well-being is a need of each and every individual, the excessive use of technology in daily routine may create disturbance in their lives, from sleeping patterns to physical-social interaction that leads to isolation and develop frustration. There is a need to educate students or individuals about how their online actions shape their digital identities, ensuring alignment & configuration, and preventing potential obstacles to future academic or professional prospects. Further studies can be conducted on the parents' critical role in managing their children's digital identity & behaviors and fostering healthy family dynamics in the digital age.

Recommendations

- There is a need to promote responsible device usage and digital detox at any time, especially before going to bed or sleep. Further need to raise awareness about the signs of digital addiction among new generation. Encourage a balance between online and offline interactions with others.
- Foster open communication in families (especially parents & siblings) about the impact of technology on interpersonal relationships, there is a need to develop awareness programs to enhance interpersonal skills and effective communication among them. Promote and spend quality time together without digital distractions.
- Arrange awareness programs related to digital literacy and the importance of an authentic online presence, and combat negative effects of social media comparison.
- Provide general guidelines and generate rules for appropriate use of technology in the classroom. Promote a balanced approach to digital and physical resources for learning among students.
- Arrange mental health awareness programs for students or other individuals and teach them stress management techniques & self-care practices.

- Encourage the responsible use of AI among students or other individuals, emphasizing it as a tool, not a replacement of human or for human interaction. Furthermore, there is a need to provide ethical information regarding the use of AI.
- Involve parents in discussions on managing the digital behavior of their children and encourage setting for family boundaries on device usage.

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