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Master's Degree Program in
Data-Driven Marketing

The Dark Side of Technology

Unplugging the Mind: Psychological Costs of Technology

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Master Thesis

presented as partial requirement for obtaining a Master's Degree in Data-Driven Marketing

NOVA Information Management School
Instituto Superior de Estatística e Gestão de Informação

Universidade Nova de Lisboa

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Unplugging the Mind: Psychological costs of Technology

by

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Master Thesis presented as partial requirement for obtaining the Master's degree in
Data-Driven Marketing, with a specialization in Digital Marketing C Analytics

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July, 2025

Statement of Integrity

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism, any form of undue use of information or falsification of results along the process leading to its elaboration. I further declare that I have fully acknowledged the Rules of Conduct and Code of Honor from the NOVA Information Management School.

Lisboa, 12/07/2025

José Maneira

Dedication

I want to dedicate this work to my mother, for her unconditional love and support, endless support and constant encouragement. Your strength and guidance have been my greatest inspiration throughout this journey.

Acknowledgements

I want to acknowledge everyone that I've spent all my life with, family, friends and professors. Everyone contributed in their own way to the person I am today, and I'm very grateful to be surrounded by the most helpful, loyal and trustworthy people. I couldn't make it here all alone.

Abstract

This study explores how technology use affects people psychologically, highlighting how it may have a detrimental effect on mental health. Understanding how technology contributes to problems like anxiety, depression, and loneliness has become crucial as it becomes more and more ingrained in daily life. This study investigates the degree to which technology affects mental health, guided by four hypotheses and concentrating on certain behaviors like as social media use and demographic moderation. Targeting a broad sample of tech users, a quantitative approach was used with a structured questionnaire created in Qualtrics. Likert-scale items were used to gather data on the frequency, intent, and emotional results of technology engagement. The moderating influences of age, gender, and education were also examined. The purpose of this study is to determine whether excessive passive technology use, such as social media scrolling, is strongly associated with elevated anxiety and depressive symptoms. On the other hand, more favorable results were linked to deliberate and active use of technology, such as online collaboration or content production. Furthermore, these impacts are greatly moderated by demographic characteristics such as age and education. With the goal of increasing awareness and guiding solutions that support healthier technology usage, this study adds to the expanding conversation on the "dark side" of technology.

KEYWORDS

- **Technology and Mental Health**
- **Digital Well-being**
- **Social Media Impact**
- **Technostress**
- **Passive vs. Active Technology Use**
- **Demographic Moderation**

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List of Abbreviations and Acronyms

FOMO Fear of Missing Out

PHQ-4 Patient Health Questionnaire-4

Q1 Quartil 1

UGT Uses and Gratifications Theory

WHO World Health Organization

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1. Introduction

In recent decades, digital technologies have become deeply embedded in everyday life, transforming the way individuals communicate, work, learn, and entertain themselves. The widespread use of smartphones, social media platforms, and other digital tools has undoubtedly brought countless advantages. These range from enhanced connectivity and access to information to greater flexibility in work and study environments. However, alongside these benefits, a growing body of literature has raised concerns about the psychological and emotional toll of excessive and unregulated technology use, together with the exponential increase in empirical studies, reviews of the impact of social media use on well- and ill-being have also surged in the past few years (Valkenburg, P. M. 2022). Emerging research has increasingly associated prolonged digital exposure with symptoms of anxiety, depression, and social isolation (Meier C Reinecke, 2021). For instance, the concept of "technostress," which refers to the stress experienced due to the inability to cope with technological demands, has gained prominence as a major contributor to digital fatigue and emotional distress (Tarafdar et al., 2014).

These concerns have become even more pronounced in the post-pandemic era. During the COVID-19 lockdowns, the global population, especially younger generations, turned to digital platforms for nearly every aspect of life (Cho et al. 2023). There is a concern that adolescents today are experiencing a "mental health crisis" compared to previous generations (Borg et al. 2024). The World Health Organization (2022) reported a substantial increase in screen time among adolescents during this period, which correlated with a significant rise in self-reported symptoms of anxiety and depression. Supporting this, a Pew Research Center study (2021) revealed that 71% of teenagers in the United States reported spending more than four hours daily on social media, with many acknowledging negative effects on their emotional well-being. These alarming statistics highlight not only the pervasiveness of digital media but also its potential risks, thus underscoring the urgency to examine the complex relationship between

technology use and mental health. While existing research has clearly demonstrated that excessive technology use can be detrimental to psychological health (Odgers et al. 2020), there remain substantial gaps in the literature regarding the mechanisms and moderating factors that influence these effects. One such gap involves the distinction between passive and active forms of technology use. Passive use, such as mindless scrolling or consuming content without engagement, has often been linked to feelings of inadequacy, disconnection, and low self-esteem (Robinson, L. 2025). In contrast, active use such as meaningful interaction, content creation, and participatory engagement may provide users with a greater sense of agency and social support (Meier C Schäfer, 2021).

However, few studies have adequately explored how these usage patterns differentially impact mental health outcomes across various demographic profiles.

Demographic variables such as age, gender, and education level appear to play a critical moderating role in this dynamic. For example, younger individuals may be more vulnerable to the negative emotional effects of passive technology use due to their developmental stage and social comparison tendencies (Valkenburg et al., 2021). Similarly, people with lower educational attainment may be less equipped to navigate digital spaces critically and may therefore be more susceptible to technostress or misinformation (Yu et al. 2024). Recent research by (Meier et al. 2024) emphasizes the need to examine how these demographic differences intersect with usage patterns to influence mental health outcomes. Nonetheless, many studies have tended to generalize findings without sufficiently accounting for these contextual nuances.

Given this landscape, the present study seeks to contribute to the ongoing discourse on digital well-being by exploring the psychological impacts of technology use, with a specific focus on social media. Through a structured and standardized quantitative questionnaire, this research investigates not only the emotional outcomes of different usage patterns (passive vs. active) but also how these outcomes vary depending on the demographic characteristics of users. The questionnaire was distributed to a large and diverse sample, gathering data on

social media behaviors, perceived psychological effects, and demographic information.

To frame the investigation, the study draws upon theoretical constructs such as the digital well-being model and the theory of technostress. These frameworks allow for a nuanced understanding of how digital behaviors intersect with mental health, providing a foundation for interpreting complex patterns in the data. Furthermore, by leveraging validated mental health assessment tools such as the GAD-7 and PHQ-9 (Kroenke et al., 2020; Spitzer et al., 2020), the study ensures a high level of reliability and comparability in its findings.

Preliminary findings suggest that passive use of technology is significantly correlated with heightened symptoms of anxiety and depression (Cheng et al. 2023), whereas active, purposeful use, particularly that which fosters connection and self-expression, tends to have more positive psychological outcomes (Zábó et al. 2025). Moreover, demographic analysis reveals that negative outcomes are disproportionately concentrated among younger users and those with lower levels of education (Alibigloo, H.P. 2025). These insights provide empirical support for the argument that not all technology use is inherently harmful, but that its effects depend critically on the way it is used and by whom.

This study thus adds to the growing literature on digital well-being by emphasizing the importance of usage patterns and demographic variables in shaping mental health outcomes. By identifying passive vs. active technology engagement as a pivotal determinant and highlighting the moderating effects of age and education, the research offers a more differentiated understanding of the digital experience. These findings have direct implications for policy-makers, educators, mental health professionals, and technology developers who aim to promote healthier digital habits and mitigate the psychological risks of modern technology use.

2. Literature Review/ Theoretical Background

Technology is no longer an optional presence in our daily lives. It permeates our communication, work routines, leisure time and even the way we process information and emotions. However, the manner in which individuals interact with technology varies widely, and these differences are critical when considering its psychological impacts. In the growing field of digital mental health, researchers have increasingly distinguished between two primary patterns of technology use: passive and active engagement. Using social media actively to interact with other users positively affects well-being, whereas passive consumption of social media content negatively affects well-being (Verduyn et al., 2022). This distinction has proven essential in understanding the heterogeneous effects of digital experiences on emotional well-being.

2.1. Passive vs. Active Technology Use

A large body of research has investigated whether using social media (SM) actively (i.e., interacting with others, such as creating content) and passively (i.e., not interacting with others, such as scrolling) is related to wellbeing (Godard, R., & Holtzman, S. 2024). Although social media behaviours (passive and active) often co-occur, this study, likewise Tibbs et al. (2024), explores how interactive communication and passive content consumption differentially impact mental health over time. Passive technology use typically involves low-interaction behaviors such as scrolling through social media feeds, consuming videos without engagement, or browsing content without posting, commenting or reacting. Although previous systematic reviews have shown an inconsistent relationship between social media use and adolescent mental health (Plackett et al. 2023), numerous studies suggest that such behaviors are consistently associated with negative psychological outcomes. For instance, Meier and Reinecke (2021) found that passive social media use exacerbates feelings of loneliness, envy, and personal inadequacy. This may be explained by the increased

exposure to curated, idealized representations of others, which can distort self-perception and amplify social comparison.

In contrast, active use of technology includes creating content, participating in online forums, messaging peers, or engaging in constructive dialogue. (Lin et al. 2024) found that more social media use to contact family/friends was related to better social support quality and better well-being, highlighting how purposeful digital interactions can have positive outcomes. This type of interaction has been linked to improved mood, stronger feelings of connectedness, and a greater sense of accomplishment (Meier et al. 2024). During the COVID-19 pandemic, a period marked by forced social distancing and elevated emotional distress, Boursier et al. (2020) demonstrated that individuals who engaged actively online were less likely to report loneliness and psychological distress compared to those whose use was predominantly passive. These findings underscore the need to assess not only the duration but also the quality and purpose of technology engagement.

During the COVID-19 pandemic, social isolation became a prominent concern, leading many individuals to increase their reliance on digital communication platforms. In this context, differences between passive and active social media use became particularly salient. For instance, individuals who predominantly consumed social content passively, such as scrolling through posts without interaction, tended to report higher levels of loneliness and anxiety. Conversely, those who engaged actively through messaging, commenting, or sharing content reported feeling more socially connected. These patterns suggest that not all forms of social media engagement are equally harmful or beneficial to mental well-being (Boursier, Gioia, Musetti, C Schimmenti, 2020).

2.2. Technostress and Digital Well-being

The concept of technostress helps explain why even necessary or habitual technology use can generate discomfort or harm. Defined as the stress experienced by individuals due to their inability to cope with technological demands, technostress has been linked to symptoms such as fatigue, anxiety,

irritability, and even burnout (Tarafdar et al., 2014). The sources of technostress are multiple: from constant connectivity and the pressure to be always reachable, to overwhelming digital workloads and the frequent updates that demand cognitive adaptability.

Recent studies have further refined this concept by introducing subdimensions such as techno-overload (feeling burdened by excessive digital tasks), techno-invasion (when technology intrudes on personal time), and techno-complexity (difficulty in understanding and using digital systems) (Wang et al., 2020). These dimensions help articulate the nuanced ways in which digital environments may tax users emotionally and cognitively.

Digital well-being, as a counterpoint, emphasizes the intentional use of technology to promote health, balance, and emotional satisfaction. It encourages self-regulation, mindful engagement and purpose-driven digital behavior. Meier and Reinecke (2021) argue that users who are able to navigate digital environments with intentionality are more likely to experience positive outcomes, including self-efficacy and emotional stability. Nevertheless, as Boursier et al. (2020) point out, the threshold between productive and harmful use is often blurred, especially when the same platforms can be used both passively and actively.

2.3. Demographic Moderation in Technology Use

The psychological consequences of technology use are not uniform across populations. Demographic factors play a significant role in moderating these effects, shaping not only the types of technology individuals adopt, but also how they experience and cope with digital environments.

Age, for example, is a critical moderator. Younger individuals, particularly adolescents and emerging adults, are more vulnerable to the emotional impact of social media. This group tends to use social platforms more intensively and is more prone to social comparison, fear of missing out (FOMO), and validation-seeking behavior (Valkenburg et al., 2021). (Meier et al.2024) found that passive social media use among younger users is associated with higher levels of

depressive symptoms and decreased self-worth and, additionally, the more time spent on social media during early adolescence may contribute to increased depressive symptoms over time (Nagata et al. 2025).

Gender also influences technology use patterns. Some studies suggest that women are more likely to experience technostress due to higher multitasking demands and emotional involvement in online interactions, while men may be more susceptible to withdrawal and technology overuse in gaming or productivity contexts (Feijt et al., 2020).

Educational attainment further conditions the digital experience. Individuals with higher education levels tend to demonstrate more critical thinking skills and digital literacy, which enables them to navigate online environments more strategically and resist manipulative or harmful content (Feijt et al., 2022). They are also more likely to engage in active rather than passive digital behaviors, mitigating some of the psychological risks associated with digital exposure. This supports the idea that demographic and behavioural moderators (e.g., age, education) shape the impact of social media use—different users experience different outcomes, not a uniform effect (Beyens et al. 2021).

2.4. Theoretical Framework

To frame the present research, this study integrates two complementary theoretical lenses: technostress theory and the digital well-being paradigm. Technostress theory, as introduced by Tarafdar et al. (2014), conceptualizes how technology-related demands can function as modern stressors. It provides a useful foundation for understanding the emotional toll of excessive and unmanaged digital engagement, especially when the boundary between personal and professional life becomes increasingly blurred.

On the other hand, the digital well-being paradigm promotes the cultivation of healthy digital habits and environments. It focuses on user agency, digital mindfulness, and the alignment between online activities and psychological needs. Together, these frameworks offer a comprehensive understanding of the

risks and opportunities of technology use, making them suitable anchors for exploring how different usage patterns (passive vs. active) and individual characteristics interact to influence mental health.

By combining these theories and incorporating recent empirical findings, this study aims to advance the field by clarifying the conditions under which technology use becomes either a protective or risk factor for psychological well-being. This integrated framework supports the construction of specific hypotheses and justifies the methodological choices made in the study's design.

3. Theoretical Model and Hypothesis Development

To better understand the psychological implications of digital behavior, the theoretical model developed in this study centers around three core concepts: general technology use, passive social media use, and active social media use. These elements, along with demographic moderators, allow for a more nuanced examination of how various forms of digital interaction influence mental health. This framework provides a foundation to explore whether all technology use contributes equally to psychological outcomes or whether specific patterns and user characteristics moderate these effects.

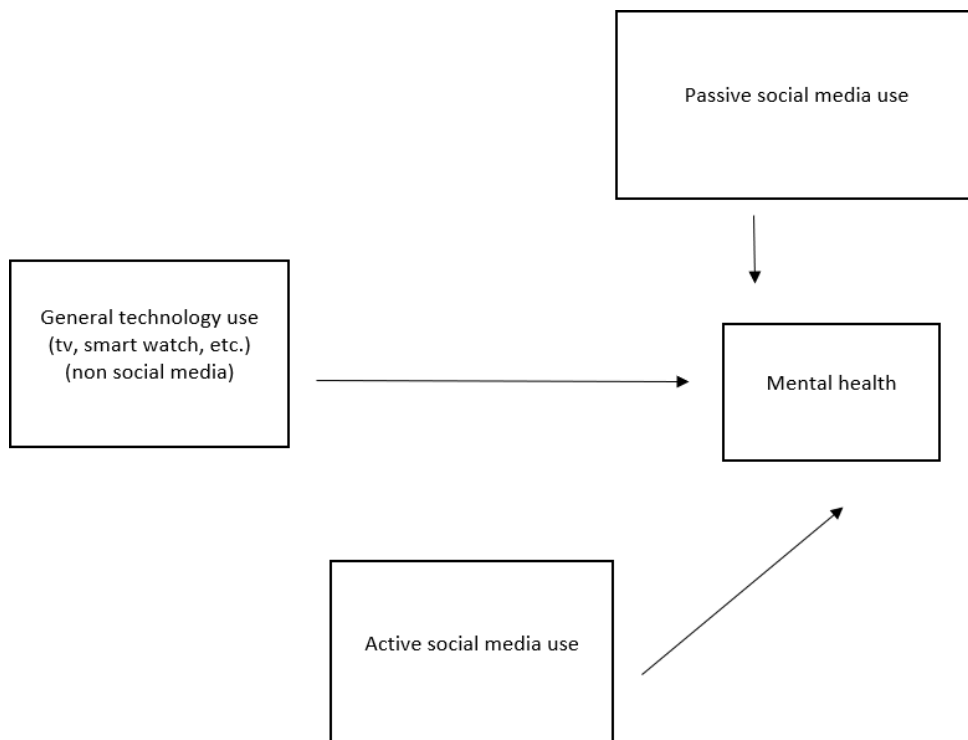


Figure 1 - Model Figure

3.1. General Technology Use

General technology use encompasses digital activities that do not involve social media platforms. Examples include watching television, using smartwatches, digital assistants, fitness trackers, or listening to music through streaming services. These behaviors, while pervasive, are often considered neutral in their impact on mental health. Their primary role in the model is to serve as a baseline to distinguish the effects of social media interactions. Although general tech use might lead to screen fatigue or sedentary behavior, its psychological effects are less socially mediated than those arising from interactive platforms (Twenge & Campbell, 2022). Hence, it is hypothesized to have a minimal or neutral influence on emotional well-being, especially when compared to the more socially intense dynamics of social media.

3.2. Passive Social Media Use

Passive social media use refers to behaviors such as scrolling through feeds, viewing others posts, and consuming content without active participation. This type of use has been repeatedly associated with negative mental health outcomes. Meier and Reinecke (2021) argue that passive use fosters upward social comparison, particularly when individuals are exposed to idealized portrayals of other people's lives. This can elicit feelings of inadequacy, envy, and loneliness. Moreover, passive consumption offers little opportunity for social reciprocity or support, which further diminishes its psychological benefits.

Research by Boursier et al. (2020) found that during the COVID-19 lockdowns, individuals who engaged in passive social media browsing reported significantly higher levels of loneliness and anxiety. In this context, the lack of meaningful interaction exacerbated the sense of social disconnection that the pandemic already intensified (Jeffers et al. 2022). The model, therefore, positions passive social media use as a strong predictor of negative mental health outcomes.

3.3. Active Social Media Use

In contrast, active social media use involves purposeful actions such as posting, commenting, messaging, and participating in online discussions or communities. This form of engagement is associated with more positive mental health indicators, as it often facilitates social connectedness, emotional expression, and perceived support. (Meier et al.2024) found that users who regularly contribute to online conversations or share their own content report greater life satisfaction and reduced symptoms of anxiety and depression.

Furthermore, active engagement can increase user's sense of agency and self-efficacy, which are important buffers against emotional distress (Meier C Schäfer, 2021). Unlike passive browsing, active use is generally more intentional and socially reciprocal (Ozimek, P. 2023), qualities that enhance its psychological benefits. In this theoretical model, active use is expected to be positively associated with mental well-being.

3.4. Model Structure and Visual Representation

The theoretical model presented (see diagram) reflects the relationships among the three main variables and their influence on mental health. General technology use leads directly to mental health outcomes, serving as a reference point. Passive social media use also connects to mental health but is posited to have a distinctly negative effect. Conversely, active social media use is proposed to enhance mental health and is visually depicted as feeding positively into the same outcome.

The arrows in the diagram represent hypothesized causal directions. Importantly, while all three types of technology use affect mental health in some capacity, the strength and valence of these effects are not equal. The model emphasizes this variation and introduces a layered understanding of digital experience.

3.5. Hypotheses

H1: General technology use has a neutral or minimal effect on mental health compared to social media use.

H2: Passive social media use is significantly associated with negative mental health outcomes, such as increased anxiety and depression.

H3: Active social media use is associated with positive mental health outcomes, such as enhanced social connectedness and well-being.

3.6. Moderating Role of Demographics

Incorporating demographic moderators enriches the model by accounting for variability across user groups. Age, gender, and educational attainment are particularly relevant in shaping how individuals experience and respond to digital content (Van Deursen et al. 2011). Younger users, especially adolescents and young adults, are more vulnerable to the negative impacts of passive social media use. Their psychological development and identity formation often rely heavily on peer validation and social comparison, which are intensified by algorithm-driven content exposure (Valkenburg et al., 2021).

Similarly, individuals with lower educational attainment may lack critical digital literacy skills that could otherwise mitigate the adverse effects of passive consumption. As Feijt et al. (2022) highlight, users with more education tend to engage more intentionally and critically with digital environments, reducing their exposure to potentially harmful content. Gender may also play a role: some studies suggest that women report higher levels of technostress, possibly due to societal expectations around emotional labor and online presence (Meier et al. 2024).

The inclusion of these moderators helps explain not only who is most at risk, but also why some individuals are more resilient than others when exposed to similar digital environments. This insight is critical for designing targeted interventions that go beyond universal recommendations.

3.7. Contribution of the Model

By outlining these differentiated pathways and incorporating contextual factors, the model offers a comprehensive approach to studying the psychological implications of technology use. It allows for a better understanding of the so-called "dark side" of digital life while also acknowledging the potential for constructive, mentally beneficial engagement.

In sum, this framework establishes a conceptual foundation for the empirical analysis that follows, providing testable hypotheses and highlighting the need to disaggregate digital behaviors and consider individual differences. In doing so, it contributes to a more refined and actionable understanding of digital well-being in contemporary society.

4. Methodology

4.1. Research Design

This study adopts a quantitative, cross-sectional research design to explore the relationship between social media usage and mental health outcomes, specifically anxiety and depression. A cross-sectional approach enables the analysis of data collected at a single point in time, allowing for the identification of associations and emerging trends between variables without requiring a longitudinal framework. This method is particularly useful in behavioral research contexts where rapid insights are needed to capture evolving technological phenomena.

Quantitative methods are widely regarded for their capacity to deliver measurable and objective data, which enhances the reliability and replicability of findings (Meier et al.2024). In the context of social media and psychological well-being, quantification allows researchers to trace patterns of engagement, frequency of use, and self-reported emotional responses in a standardized format, facilitating comparison across participants and studies.

Although cross-sectional surveys do not allow for causal inferences, they are especially suitable for exploratory research and hypothesis generation in emerging digital behaviors.

4.2. Participants and Sampling

The sample for this study comprised 206 participants aged 18 to over 45 years, all of whom were active users of at least one social media platform. Participants were recruited through digital outreach strategies, including social media groups, online forums, and targeted mailing lists. The sampling strategy followed a non-probability, convenience-based model, which is commonly used in digital health research due to its cost-effectiveness, logistical practicality, and ability to reach a broad demographic range within a short timeframe.

Although convenience sampling can lead to potential selection bias, efforts were made to diversify the participant pool by sharing the survey across multiple platforms and interest groups. This approach aimed to capture a variety of user experiences and demographic backgrounds, including variations in age, gender, and educational attainment. Nevertheless, the findings should be interpreted with caution due to the non-randomized nature of the sample, which limits the generalizability of results to the broader population.

4.3. Data Collection Instrument

The instrument used for data collection was a structured, self-administered online questionnaire designed to capture detailed information about participants' social media behavior and self-perceived mental health status. The questionnaire was developed specifically for this study and included three key components:

Demographic Information - Questions about participants' age, gender, education level, and occupation were included to allow for demographic analysis and moderation testing.

Social Media Usage - Participants were asked to report on their frequency and duration of daily social media use, platforms accessed, and the nature of their engagement (e.g., passive scrolling vs. active posting, commenting, or content creation). To help distinguish between types of usage, examples and brief definitions were provided within the questionnaire.

Perceived Psychological Effects - This section assessed participants' self-perception of how social media use affected their mood, anxiety levels, productivity, self-esteem, and sleep quality. Although standardized clinical scales such as the GAD-7 and PHQ-9 were not employed in this study, items were inspired by existing literature and structured using Likert-type response scales to facilitate interpretation and consistency.

The questionnaire was pre-tested with a small pilot group to identify potential ambiguities or technical issues before the official launch. This ensured that

questions were clear, concise, and understandable across a diverse participant base.

4.4. Data Collection Procedure

The online questionnaire was administered through a secure survey platform and disseminated via multiple digital channels. Participants received a detailed information sheet outlining the study's goals, their rights as respondents, and ethical safeguards, followed by an electronic informed consent form. Estimated completion time was under 5 minutes, balancing the need for comprehensive data with a low cognitive burden on respondents to maximize participation and minimize fatigue.

The data collection period lasted for two weeks in March 2025. Digital survey distribution was chosen not only for convenience and reach, but also due to its increasing acceptance and reliability in studies examining online behavior and psychological outcomes (Kroenke et al., 2020). The remote and anonymous nature of online data collection is particularly suited to studies involving sensitive mental health topics, as it may reduce social desirability bias and foster more honest self-reporting.

4.5. Ethical Considerations

This study received ethical clearance from Nova IMS Ethics Committee, following all applicable national and institutional guidelines for research involving human subjects. Confidentiality and data security were maintained through encrypted storage and anonymous data handling procedures.

Participants were informed that their involvement was voluntary and that they could withdraw at any time without consequence. No identifiable personal data were collected, and all responses were analyzed in aggregate form only. Additionally, given the potentially sensitive nature of some survey items related to

mental health, all participants were provided with links to free and confidential mental health resources upon completion of the questionnaire. Ethical diligence in studies involving mental health and technology is critical to safeguarding participant well-being and ensuring public trust in research (Spitzer et al., 2020).

4.6. Data Analysis

Data collected were analyzed using the built-in analytical tools and dashboard features of the Qualtrics survey platform. The platform's real-time analytics provided automatic generation of descriptive statistics such as frequency distributions, means, and standard deviations for key variables. Participant's responses were also grouped and visualized using bar charts, pie charts, and trend lines to explore patterns in social media usage and their associations with perceived psychological impacts.

Unlike traditional statistical software such as SPSS or R, which require manual coding and data cleaning, the Qualtrics dashboard offered an intuitive interface that allowed for direct exploration of the data and easy identification of trends and anomalies. While this approach is less flexible for advanced statistical modeling, it is well-suited for exploratory studies seeking to identify relationships and generate hypotheses. The decision to use Qualtrics analytics was consistent with the study's objective to interpret complex behavioral data in an accessible and visually engaging manner (Meier et al.2024).

The dashboard also enabled segmentation by demographic variables, allowing researchers to quickly observe whether certain trends were more prominent among specific age groups, genders, or education levels. This functionality was especially important for identifying potential moderating effects and guiding subsequent discussion.

By leveraging a structured survey design and a real-time data visualization approach, this methodology enables the systematic exploration of how different forms of social media engagement correlate with perceived mental health outcomes. It provides a solid empirical foundation for the interpretation of results

and the development of practical recommendations in the field of digital well-being.

5. Results

5.1. Demographic Overview

A total of 206 participants successfully completed the questionnaire, providing a solid sample base for the study's objectives. The demographic profile reveals that the majority of respondents were between 22 and 25 years old (41%), followed by individuals aged 26-29 (21%) and 18-21 (18%). This age distribution reflects a significant concentration of younger adults, who are often the most immersed in digital technology and thus represent a critical demographic for analyzing its psychological effects. The presence of participants over 30, although smaller, adds value by offering comparative insight into different stages of adulthood.

Gender distribution was relatively balanced, with 52% identifying as male, 46% as female, and 3% identifying as non-binary or third gender. This gender diversity enhances the inclusivity of the dataset and allows for more nuanced interpretations in future subgroup analyses. Educationally, the sample was highly educated, with 55% holding a Master's degree, 35% a Bachelor's degree, 7% a high school diploma, and 4% a Doctorate degree. The overrepresentation of higher education levels suggests a technologically literate population that may engage with digital platforms more critically or actively, which will be important in interpreting later findings.

5.2. Technology Usage Patterns

Technology usage was reported to be high across the board, with 45% of participants using technology for more than 6 hours per day. Another 33% used it between 4 to 6 hours, and 17% between 2 to 4 hours daily. Only a small minority (6%) reported using technology for less than 2 hours. These figures clearly indicate that extended interaction with digital devices is the norm among the participants, underscoring the relevance of this study's focus.

Participants also reported significant emotional responses to their technology use. Notably, 40% of participants somewhat agreed and 38% strongly agreed with the statement that they felt overwhelmed by their technology usage. This suggests a high prevalence of digital fatigue or technostress, which may manifest as difficulty concentrating, emotional exhaustion, or irritability.

When asked about the emotional impact of technology, 41% somewhat agreed and 31% strongly agreed that technology use negatively affected their emotional well-being. This highlights an emerging awareness among users about the psychological toll of digital immersion, which aligns with existing literature on technostress and digital burnout.

5.3. Mental Health and Social Media Usage

The data revealed compelling associations between social media usage and mental well-being. A striking 66% of participants reported feeling anxious when unable to check social media, with 34% strongly agreeing. This statistic suggests symptoms consistent with digital dependency or withdrawal, which are increasingly recognized in psychological assessments of internet and smartphone overuse.

Social comparison also emerged as a prominent theme: 68% of respondents agreed that comparing their life to others on social media negatively affected their mood, with 37% strongly agreeing. These responses align with prior studies showing that passive social media use fosters feelings of inadequacy, envy, and dissatisfaction with one's life circumstances.

Additionally, behavioral indicators such as time distortion were evident. 86% of participants reported losing track of time while using social media, with 42% strongly agreeing. This speaks to the persuasive design of digital platforms that prolong user engagement, often at the cost of productivity or mental clarity.

The data also highlighted a perceived impact on productivity. 78% of participants felt less productive when frequently using social media, with nearly half (49%)

strongly agreeing. Together, these findings suggest that overuse of digital platforms may disrupt daily routines and contribute to cognitive overload.

5.4. Cognitive and Emotional Effects of Technology

Participants provided detailed insights into the cognitive and emotional impacts of prolonged technology use. A significant 80% reported experiencing mental or physical fatigue from extended use, with 43% strongly agreeing. These symptoms align with technostress literature, suggesting that cognitive overload and screen fatigue are common outcomes of unregulated digital behavior.

Concentration was also affected: 42% of respondents reported disruptions in focus, and another 37% somewhat agreed. This decline in attention span can impact both academic and occupational functioning and may be symptomatic of constant digital interruptions and multitasking demands.

Participants perceived academic or work-related technology use as more stressful than recreational use, with 63% expressing this view. This likely reflects the performance pressure and time sensitivity associated with digital tasks in professional or academic settings.

5.5. Positive Aspects of Technology Use

Despite the above challenges, several participants highlighted positive experiences with technology. For instance, 62% stated that using technology to socialize made them feel more connected to others. This indicates that digital platforms can foster interpersonal bonds, especially in contexts where face-to-face interactions are limited.

Similarly, 54% agreed that using technology for entertainment or leisure improved their mental health. This suggests that digital media can offer effective coping mechanisms and emotional relief, particularly when used with intention and moderation.

A notable 61% felt that their familiarity with digital tools helped them manage their mental health. This points to the empowering potential of technology when used for mental health tracking, accessing support networks, or consuming psychoeducational content.

Online communities and interactive digital environments were also highlighted as beneficial. 62% of respondents stated that engaging in positive online communities contributed to their emotional well-being, while 64% said that active online participation helped them form meaningful relationships.

5.6. Passive vs. Active Technology Use

One of the central questions in this study focused on the distinction between passive and active technology use. The results were conclusive: 68% of respondents reported feeling unsatisfied after passively scrolling through social media without interacting. Conversely, 64% reported a sense of accomplishment when creating or sharing content.

Furthermore, 62% agreed that engaging with online communities had a positive effect on their mental health. This supports the growing view that active, intentional engagement with digital content is more likely to enhance psychological well-being.

Interestingly, 68% felt anxious or inferior after consuming online content passively, while. These effects may contribute to mood fluctuations and reinforce negative thought patterns.

In contrast, 64% of participants indicated that actively producing content or participating in discussions helped lower their stress levels. This highlights the importance of agency and purposeful use in shaping the digital experience.

5.7. Summary of Key Findings

In summary, the results demonstrate a multifaceted relationship between technology use and mental health outcomes. Excessive or passive engagement

with digital platforms is strongly associated with symptoms of anxiety, emotional fatigue, sleep disruption, and reduced productivity. Meanwhile, purposeful and interactive use appears to offer compensatory benefits, promoting social connection, stress relief, and emotional resilience.

These findings underscore the need for more mindful digital practices and point to the value of educating users about the psychological consequences of different types of online behavior. They also lay the groundwork for further discussion regarding policy, intervention, and public awareness strategies to address the growing mental health challenges in the digital age.

6. Discussion

6.1. Interpretation of Results

The findings of this study provide compelling evidence that excessive use of social media, particularly passive engagement, is significantly associated with elevated levels of anxiety, emotional distress, and decreased overall well-being, as also cited by (Zubair et al. 2023).

Participants who reported frequent passive behaviors, such as browsing content without direct interaction, consistently indicated more negative emotional states. These results reinforce a growing body of literature suggesting that passive social media consumption promotes upward social comparison, which leads to feelings of inadequacy, envy, and decreased life satisfaction (Verduyn et al., 2021). Passive users are more likely to encounter curated portrayals of other's lives, which may foster unrealistic benchmarks for success, appearance, or happiness (Nor et al. 2025).

Conversely, participants who engaged in more active behaviors, such as posting content, messaging friends, or commenting on posts, exhibited a notably weaker correlation with negative mental health outcomes. Although the protective effect of active use was not strongly pronounced in this data, the contrast with passive users suggests that greater user agency and social interaction may buffer against some of the psychological harms linked to digital engagement. These findings are consistent with prior research showing that active social media behaviors can facilitate social connection, enhance self-expression, and reduce perceived loneliness (Gonzales C Hancock, 2022).

Further analysis revealed that individuals spending more than four hours per day on social media reported substantially higher levels of perceived stress and emotional fatigue. This aligns with Brailovskaia and Margraf (2021), who demonstrated that overexposure to digital platforms increases the risk of cognitive overload, decision fatigue, and mood disturbances. These extended screen times often correspond to disrupted daily routines and compromised sleep hygiene,

both of which are well-established contributors to psychological strain.

Particularly noteworthy is the age-related sensitivity observed in this study. Respondents aged 18 to 24 years old showed a greater vulnerability to negative emotional outcomes associated with digital use. This finding is consistent with Keles et al. (2020), who identified that adolescents and young adults are more susceptible to the psychological effects of social comparison and digital overstimulation. The developmental and social pressures faced by this demographic, combined with the ubiquitous presence of social media, may explain their heightened risk.

6.2. Comparison with Existing Literature

This study contributes to and extends the current understanding of social media's influence on mental health by both supporting and, in some instances, challenging previous findings. For example, consistent with Fardouly et al. (2021), these results affirm that social comparison via social media leads to declines in self-esteem and increased depressive symptoms. Participants in this sample reported diminished mood and productivity after frequent exposure to content perceived as unattainably ideal, in line with (Gimpel et al. 2024) unified model of digital hindrance stressors, that treats passive social media use as a likely hindrance-oriented behaviour that may elicit negative psychological outcomes. These data support the argument that social networking sites function as social comparison engines, exacerbating insecurities and emotional distress.

These results also reinforce concerns raised by Chung et al. (2021), who found a strong link between increased screen time and disrupted sleep. Respondents in my study confirmed that extended use of smartphones and computers, particularly before bedtime, negatively affected their sleep quality, thereby contributing to emotional fatigue and cognitive impairment.

My findings also align with (Kelly & Sharot's 2025) finding, that browsing more negative information was associated with worse mental health and mood,

suggesting that passive consumption may amplify negative affect.

However, my findings diverge slightly from studies such as Seabrook et al. (2021), which highlight the potential for active social media use to foster psychological benefits, particularly through the development of support networks. While i found some indications that active engagement was less harmful than passive scrolling, the expected positive outcomes of such engagement were less pronounced. One possible explanation lies in the type or quality of online interactions. Superficial or sporadic engagement, even if technically active, may not be sufficient to yield emotional benefits. Moreover, the algorithms that shape social media exposure might limit user's access to supportive content while amplifying emotionally provocative or triggering material (Awasthi, S. 2025).

6.3. Mechanisms and Moderators

The data suggest that psychological outcomes are not determined merely by time spent on social media but by how individuals use digital platforms. Individual coping strategies and organizational support play a critical moderating and mediating role in mediating negative psychological outcomes (Nastjuk et al. 2023). Passive consumption encourages automatic scrolling and emotional disengagement, often leading to overstimulation and reduced reflection. In contrast, active engagement requires greater intentionality and can encourage social reciprocity and self-expression. This distinction is critical in explaining why some users derive meaning or connection from their digital activity while others experience emotional harm.

Demographic variables such as age, gender, and education also moderate the impact of technology use (Aldowah et al. 2017). While this study found stronger negative effects among younger users, other studies suggest that women may be more prone to social comparison, while higher educational attainment may provide protective digital literacy skills (Meier et al.2024). Although this data is not disaggregated enough to confirm these patterns definitively, they provide avenues for future research to explore differential vulnerabilities and coping strategies.

Another key mechanism to consider is algorithmic influence. The content individuals are exposed to is not neutral but shaped by predictive systems designed to maximize engagement (El Maki et al. 2025). Participants in this study reported frequent exposure to emotionally triggering or polarizing content, which likely compounds psychological strain. Future studies should consider algorithmic exposure as a moderating variable in digital well-being.

6.4. Limitations and Alternative Explanations

While the findings are robust, several limitations should be acknowledged. First, the use of a convenience sample limits the generalizability of the results. Although demographic diversity was achieved, the sample may not fully represent the wider population, particularly those with limited access to technology or differing usage patterns.

Second, the cross-sectional design restricts our ability to infer causality. While we can observe strong correlations between digital behaviors and mental health outcomes, we cannot determine whether social media use causes emotional distress or whether individuals already experiencing distress are more likely to use social media excessively. Longitudinal studies would be better suited to exploring causal pathways.

Additionally, all data was self-reported, which introduces the potential for response bias. Participants may have underreported or exaggerated their social media habits or emotional states, either consciously or unconsciously. While this is a common challenge in survey-based research, it suggests that future studies could benefit from incorporating digital trace data or clinical assessments.

6.5. Directions for Future Research

Building on the insights generated by this study, future research should consider several avenues. First, a more detailed analysis of the content consumed (e.g., news, entertainment, lifestyle) and the intent behind usage (e.g., boredom, connection, self-expression) could yield richer understandings of the

psychological effects of technology. Additionally, future work should examine how personality traits such as neuroticism or extroversion, influence digital behavior and mental health outcomes.

It would also be valuable to investigate the role of digital literacy and resilience-building interventions, particularly among younger users. Programs designed to foster critical engagement with digital content, emotional regulation, and conscious social media habits could mitigate many of the negative effects observed.

Lastly, the psychological impact of newer forms of digital interaction such as livestreaming, short-form video, or virtual reality platforms, remains underexplored. As digital ecosystems continue to evolve, it is crucial that research keeps pace and adapts its methods and focus accordingly.

6.6. Summary

In conclusion, this study confirms that the nature and intensity of social media use play a crucial role in shaping mental health outcomes (Sabar, S. et al. 2024). Passive use, particularly when excessive, is linked to heightened emotional distress, while more active, intentional use offers a partial buffer. However, these relationships are mediated by demographic and contextual variables, such as age, type of interaction, and content exposure. The findings underscore the importance of nuanced approaches to digital well-being and offer a foundation for developing targeted interventions, educational initiatives, and further academic inquiry into the psychological dimensions of technology use.

7. Implications

7.1. Theoretical Implications

This study contributes meaningfully to the growing body of research examining the psychological consequences of technology use, particularly through the lens of social media engagement. While prior investigations have explored general associations between social media use and mental health outcomes, this research advances the field by explicitly distinguishing between active and passive usage behaviors. This differentiation helps to clarify inconsistencies in previous findings and supports a more nuanced understanding of digital interaction.

Specifically, the results validate and expand upon core principles of the Uses and Gratifications Theory (UGT), which posits that users actively select media platforms and forms of engagement based on psychological and social needs. In this context, active users, those who contribute content or engage in dialogue, may experience greater agency and satisfaction, while passive users, those who simply scroll or observe, report diminished well-being due to social comparison and emotional disengagement.

Moreover, the findings reinforce and extend the Cognitive-Behavioral Model of problematic internet use, which suggests that maladaptive cognitions and behaviors surrounding technology use can result in psychological distress. The significant link between passive use and increased reports of anxiety, depression, and emotional fatigue underscores this model's applicability. Passive behaviors appear to magnify cognitive distortions (e.g., catastrophizing or feelings of inferiority), particularly when individuals are exposed to idealized portrayals of other's lives. These insights not only validate existing theoretical constructs but also suggest directions for their refinement, such as incorporating the role of algorithmic exposure or distinguishing between intentional and habitual passive use.

This study also intersects meaningfully with the Technostress Theory, which focuses on the stress induced by continuous interaction with evolving digital

environments. The psychological strain reported by participants, manifesting as mental fatigue, reduced concentration, and emotional exhaustion, reflects core components of technostress. By identifying the behavioral patterns most strongly associated with these outcomes, the study contributes empirical specificity to what has historically been a broad theoretical construct.

Further theoretical advancement is made by introducing the moderating role of demographic factors. Age, in particular, was found to shape the psychological effects of social media use, with younger individuals demonstrating heightened emotional reactivity. This supports calls in the literature to develop age-sensitive theoretical models that recognize life-stage differences in cognitive development, social needs, and emotional regulation. Education level may similarly moderate the effects through its association with digital literacy and critical thinking. Thus, future models should integrate demographic moderators to more accurately reflect real-world diversity in digital experience.

Finally, the distinction between content consumption and content creation emerges as a key theoretical variable. Traditional media theories often treat media exposure as a unidirectional process, but this study reinforces the value of treating users as interactive agents whose mental health is shaped not only by the content they encounter but also by the way they engage with it. This perspective contributes to evolving frameworks in digital well-being and user-centric design by demonstrating that psychological outcomes depend not only on screen time but also on screen purpose.

7.2. Practical Implications

The results of this research carry wide-ranging implications for mental health professionals, educators, policymakers, and digital platform designers. Given the clear association between passive social media engagement and increased psychological distress, targeted interventions aimed at fostering healthier online behaviors are urgently needed. Mental health practitioners can incorporate these findings into cognitive-behavioral therapy (CBT) frameworks, helping clients to

identify maladaptive digital habits and restructure their use of social media toward more active and purposeful engagement. Therapists might, for example, employ digital journaling or mood tracking tools to help clients reflect on how different forms of technology use affect their emotions, productivity, and sense of self.

In educational settings, the integration of digital literacy and emotional resilience training can be instrumental in equipping students to navigate online spaces more mindfully. Schools and universities can incorporate curricula that raise awareness of algorithmic manipulation, the psychology of social comparison, and the importance of intentional engagement. Workshops and peer-led initiatives could also encourage students to set boundaries around screen time, cultivate offline relationships, and critically evaluate the content they consume.

From a technological perspective, social media platforms and app developers have a responsibility to consider the psychological impact of their design choices. User interface features that promote endless scrolling, push notifications, and algorithm-driven content exposure may unintentionally reinforce passive behaviors and emotional reactivity. In response, designers can integrate features that nudge users toward more meaningful engagement, such as reflective prompts, custom usage analytics, and reminders to disconnect. For example, platforms could notify users when passive browsing exceeds a certain threshold and suggest a more interactive alternative (e.g., sending a message, participating in a group discussion, or engaging with mental health resources).

There is also growing interest in implementing emotion-aware algorithms that detect distress signals (e.g., rapid scrolling, repeated exposure to negative content) and adapt content delivery accordingly. Such interventions, while still emerging, hold promise in mitigating emotional harm through adaptive technology.

Policymakers and public health organizations also have a critical role to play. The study's findings support the development of national awareness campaigns that educate citizens about the psychological risks of excessive and passive technology use. Such campaigns might parallel those used for substance abuse or sleep hygiene, emphasizing balance, self-regulation, and informed digital choices.

Public service announcements, school-based programs, and workplace wellness initiatives could all be leveraged to shift social norms and foster healthier technology cultures.

In terms of policy development, governments could consider requiring platforms to provide transparency regarding algorithmic content delivery, offer user-friendly data on personal usage patterns, and include mental health impact assessments in product development pipelines. International collaboration may be necessary to develop ethical standards for technology use, particularly as digital consumption becomes increasingly globalized and interconnected.

7.3. Integrated Perspective

Importantly, the study's theoretical and practical implications are mutually reinforcing. By deepening theoretical understanding of how different forms of technology use impact mental health, researchers can better inform the design of interventions, educational programs, and policy guidelines. Conversely, the implementation of such practices offers opportunities to gather further empirical data and refine existing models. This cyclical relationship between theory and practice is essential to addressing the rapidly evolving nature of digital technology and its effects on human psychology.

Ultimately, this study underscores the importance of adopting a multidimensional approach to digital well-being, one that acknowledges not only time spent online but also the psychological intent, behavioral patterns, and contextual moderators that shape user experience. Through continued collaboration between researchers, practitioners, technologists, and policymakers, it is possible to cultivate healthier relationships with digital technology and reduce the mental health risks associated with its misuse.

8. Conclusion

This study set out to explore the intricate relationship between social media usage and mental health, with particular attention to anxiety and depression. Through a structured questionnaire administered to a diverse sample of 206 participants, the research uncovered compelling evidence that patterns of digital engagement, especially passive behaviors such as scrolling through social media without interaction, are significantly linked to negative psychological outcomes. These findings reinforce a growing consensus in the academic literature that excessive and unregulated exposure to online content can trigger social comparison, fear of missing out (FOMO), emotional exhaustion, and ultimately contribute to deteriorating mental health.

One of the primary contributions of this study lies in the clear differentiation between active and passive social media use. While both forms of engagement are common in contemporary digital life, they appear to have markedly different psychological consequences. Active usage, defined here as content creation, messaging, and interactive participation, was found to have a comparatively weaker or even slightly positive association with mental health. In contrast, passive use was consistently correlated with feelings of loneliness, inadequacy, and emotional fatigue. This distinction holds significant implications for both academic theory and practical intervention, as it highlights the importance of the nature and quality of digital interactions, rather than simply their frequency or duration.

Moreover, the study sheds light on how demographic factors, such as age and education level, may moderate the relationship between social media use and mental well-being. Younger individuals, especially those in the 18-24 age range, were found to be particularly vulnerable to the negative effects of passive engagement. This is consistent with broader developmental psychology literature suggesting that adolescents and young adults are more susceptible to peer comparison, identity instability, and emotional volatility in the context of digital

media exposure. By identifying these moderating variables, the research not only affirms previous theoretical models but also opens new pathways for personalized mental health interventions.

Despite these valuable contributions, the study is not without its limitations. Most notably, the data were derived from self-reported measures, which are inherently subject to social desirability bias and individual perceptual inaccuracies.

Participants may have either overestimated or underestimated the frequency and emotional impact of their social media habits. Furthermore, the cross-sectional nature of the study precludes any definitive causal inferences. While correlations were observed between usage patterns and mental health symptoms, it remains unclear whether social media behaviors cause emotional distress or are themselves consequences of underlying psychological conditions.

Another limitation pertains to the scope of the sample. Although the study included participants from a range of age groups and educational backgrounds, it was limited to individuals who had access to and were willing to engage with the online questionnaire. This may have introduced sampling bias, particularly if individuals experiencing more severe forms of anxiety or depression were less likely to participate. Future research should aim to include more representative samples across geographic, cultural, and socioeconomic lines to enhance generalizability.

Looking ahead, longitudinal research designs would offer a valuable extension of this study by tracking participants over time to better understand the directionality of observed relationships. Such studies could determine whether prolonged passive social media use leads to increased psychological distress, or if individuals with pre-existing mental health challenges are more likely to engage in passive digital behaviors. Additionally, incorporating objective behavioral data, such as app usage logs or biometric indicators of stress, would strengthen the reliability and depth of analysis. Collaborations with social media platforms to access anonymized user data could provide insights into real-time engagement trends and emotional responses.

Furthermore, experimental interventions that seek to modify digital behavior, such as encouraging active participation or introducing digital detox strategies, could serve as valuable tests of causality and therapeutic efficacy. These studies may also explore the effectiveness of personalized digital well-being tools that tailor suggestions based on a user's mood, time online, or engagement history.

In conclusion, this study reinforces the urgent need for digital wellness strategies that address not just how much time individuals spend online, but how they engage with technology. By drawing attention to the psychological consequences of passive social media use and highlighting demographic sensitivities, this research contributes to a more nuanced understanding of the digital landscape. These insights are crucial for guiding public policy, informing educational programs, and supporting the development of technologies that promote mindful, purposeful engagement.

As society becomes increasingly embedded in digital environments, it is imperative that individuals, communities, and institutions adopt a proactive stance in managing the psychological impact of technology. Encouraging reflective media consumption, fostering digital literacy, and supporting emotional resilience in digital spaces will be key pillars of future mental health advocacy. Through continued interdisciplinary collaboration, it is possible to harness the benefits of technology while safeguarding psychological well-being in an ever-connected world.

References

- Aldowah, H., Ghazal, S., & Muniandy, B. (2017). The impacts of demographic variables on technological and contextual challenges of e-learning implementation. *Journal of Physics: Conference Series*, 892, Article 012013. <https://doi.org/10.1088/1742-6596/892/1/012013>
- Alibigloo, H. P. (2025). Unraveling the impact of modern technologies on young minds: A comprehensive study. *OBM Neurobiology*, 9(1), Article 264. <https://doi.org/10.21926/obm.neurobiol.2501264>
- Awasthi, S. (2025). From clicks to chaos: How social media algorithms amplify extremism. Observer Research Foundation. <https://www.orfonline.org/expert-speak/from-clicks-to-chaos-how-social-media-algorithms-amplify-extremism>
- Beyens, I., Pouwels, J. L., van Driel, I. I., Keijsers, L., & Valkenburg, P. M. (2021). Social Media Use and Adolescents' Well-Being: Developing a Typology of Person-Specific Effect Patterns. *Communication Research*, 51(6), 691-716. <https://doi.org/10.1177/00936502211038196>
- Borg, K., Heffer, T., & Willoughby, T. (2024). Generational shifts in adolescent mental health: A longitudinal time-lag study. *Journal of Youth and Adolescence*. Advance online publication. <https://doi.org/10.1007/s10964-024-02095-3>
- Boursier, V., Gioia, F., Musetti, A., C Schimmenti, A. (2020). Facing loneliness and anxiety during the COVID-19 isolation: The role of excessive social media use in a sample of Italian adults. *Clinical Neuropsychiatry*, 17(2), 95-99. <https://pmc.ncbi.nlm.nih.gov/articles/PMC7752864/>
- Brailovskaia, J., C Margraf, J. (2021). The relationship between burden caused by coronavirus (COVID-19), addictive social media use, sense of control and anxiety. *Computers in Human Behavior*, 119, 106720. <https://doi.org/10.1016/j.chb.2021.106720>

Cheng, W., Nguyen, D. N., & Nguyen, P. N. T. (2023). The association between passive social network usage and depression/negative emotions with envy as a mediator. *Scientific Reports*, 13, Article 10097.

<https://doi.org/10.1038/s41598-023-37185-y>

Cho, H., Li, P., Ngien, A., Tan, M. G., Chen, A., & Nekmat, E. (2023). The bright and dark sides of social media use during COVID-19 lockdown: Contrasting social media effects through social liability vs. social support. *Computers in human behavior*, 146, 107795. <https://doi.org/10.1016/j.chb.2023.107795>

El Malki, O., Aubin Le Quéré, M., Monroy-Hernández, A., & Horta Ribeiro, M. (2025). Bonsai: Intentional and personalized social media feeds

<https://doi.org/10.48550/arXiv.2509.10776>

Fardouly, J., Diedrichs, P. C., Vartanian, L. R., C Halliwell, E. (2021). Social comparisons on social media: The impact of Facebook on young women's body image concerns and mood. *Body Image*, 28, 1-5.

<https://pubmed.ncbi.nlm.nih.gov/25615425/>

Feijt, M. A., de Kort, Y. A. W., Bongers, I. M. B., Bierbooms, J. J. P. A., Westerink, J. H. D. M., C IJsselstein, W. A. (2020). Mental health care goes online: Practitioners' experiences of providing mental health care during the COVID-19 pandemic. *Cyberpsychology, Behavior, and Social Networking*, 23(12), 860-864. <https://doi.org/10.1089/cyber.2020.0370>

Godard, R., & Holtzman, S. (2024). Are active and passive social media use related to mental health, wellbeing, and social support outcomes? A meta-analysis of 141 studies. *Journal of Computer-Mediated Communication*, 29(1).

<https://doi.org/10.1093/jcmc/zmad055>

Henner Gimpel, Julia Lanzl, Christian Regal, Nils Urbach, Julia Becker, Patricia Tegtmeier (2024) Stress from Digital Work: Toward a Unified View of Digital Hindrance Stressors. *Information Systems Research* 36(2):896-915.

<https://doi.org/10.1287/isre.2022.0691>

Jeffers, A., Meehan, A. A., Barker, J., Asher, A., Montgomery, M. P., Bautista, G., Ray, C. M., Laws, R. L., Fields, V. L., Radhakrishnan, L., Cha, S., Christensen, A., Dupervil, B., Verlenden, J. V., Cassell, C. H., Boyer, A., DiPietro, B., Cary, M., Yang, M., Mosites, E., ... Marcus, R. (2022). Impact of Social Isolation during the COVID-19 Pandemic on Mental Health, Substance Use, and Homelessness: Qualitative Interviews with Behavioral Health Providers. *International journal of environmental research and public health*, 19(19), 12120.

<https://doi.org/10.3390/ijerph191912120>

Keles, B., McCrae, N., C Grealish, A. (2020). A systematic review: The influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth*, 25(1), 79-93.

<https://doi.org/10.1080/02673843.2019.1590851>

Kelly, C. A., & Sharot, T. (2025). Web-browsing patterns reflect and shape mood and mental health. *Nature Human Behaviour*, 9(1), 133 - 146.

<https://doi.org/10.1038/s41562-024-02065-6>

Lin, X. Y., & Lachman, M. E. (2024). Social Media Use and Daily Well-Being: The Role of Quantity and Quality of Social Support. *Research on Aging*, 46(5-6), 287-301. <https://doi.org/10.1177/01640275241227575>

Meier, A., C Reinecke, L. (2021). Computer-mediated communication, social media, and mental health: A conceptual and empirical meta-review. *Communication Research*, 48(8), 1182-1209.

<https://doi.org/10.1177/0093650220958224>

Meier, A., Domahidi, E., Dienlin, T., Hill, C., & Reinecke, L. (2024). Are active and passive social media use related to mental health, wellbeing, and social support outcomes? *Journal of Computer-Mediated Communication*, 29(1), zmad055. <https://doi.org/10.1093/jcmc/zmad055>

Nagata, J. M., Otmar, C. D., Shim, J., Balasubramanian, P., Cheng, C. M., Li, E. J., Al-Shoaibi, A. A., Shao, I. Y., Ganson, K. T., Testa, A., Kiss, O., He, J., & Baker, F. C. (2025). Social media use and depressive symptoms during early adolescence. *JAMA Network Open*, 8(5), e2511704.

<https://doi.org/10.1001/jamanetworkopen.2025.11704>

Nastjuk, I., Trang, S., Grummeck-Braamt, J. V., Adam, M. T. P., & Tarafdar, M. (2023). Integrating and synthesising technostress research: a meta-analysis on technostress creators, outcomes, and IS usage contexts. *European Journal of Information Systems*, 33(3), 361-382.

<https://doi.org/10.1080/0960085X.2022.2154712>

Nor, N. F. M., Iqbal, N., & Shaari, A. H. (2025). The Role of False Self-Presentation and Social Comparison in Excessive Social Media Use. *Behavioral sciences* (Basel, Switzerland), 15(5), 675.

<https://doi.org/10.3390/bs15050675>

Odgers, C. L., & Jensen, M. R. (2020). Annual research review: Adolescent mental health in the digital age: Facts, fears, and future directions. *Journal of Child Psychology and Psychiatry*, 61(3), 336-348.

<https://doi.org/10.1111/jcpp.13190>

Ozimek, P. (2023). Active and passive behavior in social media: Validating the Social Media Activity Questionnaire (SMAQ). *Computers in Human Behavior Reports*, 11, Article 100244. <https://doi.org/10.1016/j.chbr.2023.100244>

Plackett R, Sheringham J, Dykxhoorn J (2023) The Longitudinal Impact of Social Media Use on UK Adolescents' Mental Health: Longitudinal Observational Study *J Med Internet Res* 2023;25:e43213 [10.2196/43213](https://doi.org/10.2196/43213)

Robinson, L. (2025, August 20). Social media and mental health: Social media addiction. HelpGuide. <https://www.helpguide.org/mental-health/wellbeing/social-media-and-mental-health>

Sabar, S., Dzulkalnine, N., & Mohd Khi-r, M. (2024). The impact of social media on mental health of young adults: A literature review. *Information Management & Business Review*, 16(35 (a)), 447-460.

https://www.researchgate.net/publication/385333654_The_Impact_of_Social_Media_on_Mental_Health_of_Young_Adults_A_Literature_Review

Seabrook, E. M., Kern, M. L., C Rickard, N. S. (2021). Social networking sites, depression, and anxiety: A systematic review. *JMIR Mental Health*, 3(4), e50.

<https://doi.org/10.2196/mental.5842>

Spitzer, R. L., Kroenke, K., Williams, J. B., C Löwe, B. (2020). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092-1097. <https://doi.org/10.1001/archinte.166.10.1092>

Tarafdar, M., Pullins, E. B., C Ragu-Nathan, T. S. (2014). Technostress: Negative effect on performance and possible mitigations. *Information Systems Journal*, 25(2), 103-132. <https://doi.org/10.1111/isj.12042>

Tibbs, M., Deschênes, S. S., van der Velden, P., & Fitzgerald, A. (2024). An investigation of the longitudinal bidirectional associations between interactive versus passive social media behaviors and youth internalizing difficulties: A within-person approach. *Journal of Youth and Adolescence*. Advance online publication. <https://doi.org/10.1007/s10964-024-02093-5>

Valkenburg, P. M., Beyens, I., Pouwels, J. L., van Driel, I. I., & Keijsers, L. (2021). Social media use and adolescents' self-esteem: Heading for a person-specific media effects paradigm. *Journal of Communication*, 71(1), 56-78. <https://doi.org/10.1093/joc/jqaa039>

Valkenburg, P. M. (2022). Social media use and well-being: What we know and what we need to know. *Current Opinion in Psychology*, 45, Article 101294. <https://doi.org/10.1016/j.copsyc.2021.12.006>

Van Deursen, A. J. A. M., van Dijk, J. A. G. M., & Peters, O. (2011). Rethinking Internet skills: The contribution of gender, age, education, Internet experience, and hours online to medium- and content-related Internet skills. *Poetics*, 39(2), 125-144. <https://doi.org/10.1016/j.poetic.2011.02.001>

Verduyn, P., Gugushvili, N., Massar, K., Täht, K., C Kross, E. (2021). Social comparison on social networking sites. *Current Opinion in Psychology*, 36, 32-37. <https://doi.org/10.1016/j.copsyc.2020.04.002>

Verduyn, P., Gugushvili, N., & Kross, E. (2022). Do social networking sites influence well-being? The extended active-passive model. *Current Directions in Psychological Science*, 31(1), 62-68. <https://doi.org/10.1177/09637214211053637>

Yu, J., Bekerian, D. A., & Osback, C. (2024). Navigating the Digital Landscape: Challenges and Barriers to Effective Information Use on the Internet. *Encyclopedia*, 4(4), 1665-1680. <https://doi.org/10.3390/encyclopedia4040109>

Zábó, V., Lehoczki, A., Fekete, M., Szappanos, Á., Varga, P., Moizs, M., Giovannetti, G., Loscalzo, Y., Giannini, M., Polidori, M. C., Busse, B., Kellermayer, M., Ádány, R., Purebl, G., & Ungvari, Z. (2025). The role of purpose in life in healthy aging: implications for the Semmelweis Study and the Semmelweis-EUniWell Workplace Health Promotion Model Program. *GeroScience*, 47(3), 2817-2833. <https://doi.org/10.1007/s11357-025-01625-6>

Zubair, U., Khan, M. K., & Albashari, M. (2023). Link between excessive social media use and psychiatric disorders. *Annals of medicine and surgery* (2012), 85(4), 875-878. <https://doi.org/10.1097/MS9.000000000000112>

Appendix A

What is your age? 200 ⓘ

Q1 - What is your age?	Percentage	Count
18-21	18%	36
22-25	41%	81
26-29	21%	42
30-35	7%	13
36-45	6%	11
45+	9%	17

What is your gender? 200 ⓘ

Q2 - What is your gender?	Percentage	Count
Male	52%	103
Female	46%	92
Non-binary / third gender	3%	5

What is your highest level of education? 200 ⓘ

Q3 - What is your highest level of education?	Percentage	Count
High School	7%	14
Bachelor	35%	69
Master	55%	109
Doctorate	4%	8

How many hours a day do you use technology, such as computers, game consoles, and phones? 200 ⓘ

Q4 - How many hours a day do you use technology, such as computers, game consoles, and phones?	Percentage	Count
less than 2 hours	6%	11
2 to 4 hours	17%	34
4 to 6 hours	33%	65
more than 6 hours	45%	90

I frequently feel overwhelmed by how much time I spend on technology. 195 ⓘ

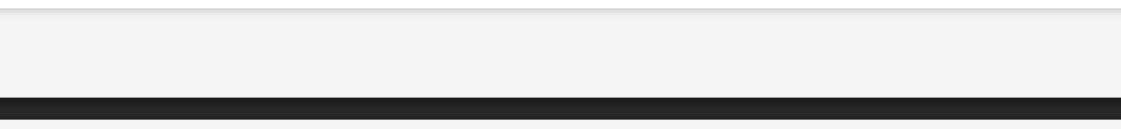
Q5 - I frequently feel overwhelmed by how much time I spend on technology.	Percentage	Count
Strongly disagree	2%	3
Somewhat disagree	6%	11
Neither agree nor disagree	14%	28
Somewhat agree	40%	78
Strongly agree	38%	75

I think using technology has a detrimental impact on my emotional health. 195 ⓘ

Q6 - I think using technology has a detrimental impact on my emotional health.	Percentage	Count
Strongly disagree	2%	3
Somewhat disagree	8%	15
Neither agree nor disagree	18%	36
Somewhat agree	41%	80
Strongly agree	31%	61

My capacity to concentrate on work or daily duties is disrupted by technology. 195 ⓘ

Q7 - My capacity to concentrate on work or daily duties is disrupted by technology.	Percentage	Count
Strongly disagree	2%	3
Somewhat disagree	4%	7



Q7 - My capacity to concentrate on work or daily duties is disrupted by technology.	Percentage	Count
Neither agree nor disagree	15%	30
Somewhat agree	37%	73
Strongly agree	42%	82

After using technology for a long time, I get tired, either mentally or physically. 195 ⓘ

Q8 - After using technology for a long time, I get tired, either mentally or physically.	Percentage	Count
Strongly disagree	2%	3
Somewhat disagree	8%	15
Neither agree nor disagree	12%	24
Somewhat agree	35%	69
Strongly agree	43%	84

I feel anxious when I am not able to check my social media accounts. 195 ⓘ

Q9 - I feel anxious when I am not able to check my social media accounts.	Percentage	Count
Strongly disagree	7%	13
Somewhat disagree	9%	17
Neither agree nor disagree	18%	36
Somewhat agree	32%	62
Strongly agree	34%	67

Comparing my life to others on social media negatively affects my mood. 194 ⓘ

Q10 - Comparing my life to others on social media negatively affects my mood.	Percentage	Count
Strongly disagree	5%	10
Somewhat disagree	9%	18
Neither agree nor disagree	18%	34
Somewhat agree	31%	60
Strongly agree	37%	72

When I use social media, I frequently lose track of time. 195 ⓘ

Q11 - When I use social media, I frequently lose track of time.	Percentage	Count
Strongly disagree	3%	5
Somewhat disagree	3%	6
Neither agree nor disagree	9%	17
Somewhat agree	44%	86
Strongly agree	42%	81

I feel less productive when I use social media frequently. 195 ⓘ

Q12 - I feel less productive when I use social media frequently.	Percentage	Count
Strongly disagree	2%	4
Somewhat disagree	7%	13
Neither agree nor disagree	13%	26

Q12 - I feel less productive when I use social media frequently.	Percentage	Count
Somewhat agree	29%	56
Strongly agree	49%	96

I find that playing games and viewing videos online help me relax. 195 ⓘ

Q13 - I find that playing games and viewing videos online help me relax.	Percentage	Count
Strongly disagree	6%	12
Somewhat disagree	11%	21
Neither agree nor disagree	21%	41
Somewhat agree	35%	68
Strongly agree	27%	53

Using technology to socialize with others makes me feel more connected. 195 ⓘ

Q14 - Using technology to socialize with others makes me feel more connected.	Percentage	Count
Strongly disagree	2%	4
Somewhat disagree	18%	36
Neither agree nor disagree	17%	34
Somewhat agree	36%	71
Strongly agree	26%	50

My mental health improves when I use technology for entertainment or leisure. 194 ⓘ

Q15 - My mental health improves when I use technology for entertainment or leisure.	Percentage	Count
Strongly disagree	1%	2
Somewhat disagree	15%	30
Neither agree nor disagree	30%	59
Somewhat agree	34%	65
Strongly agree	20%	38

Technology used for work or academic purposes creates more stress for me than other uses. 193 ⓘ

Q16 - Technology used for work or academic purposes creates more stress for me than other uses.	Percentage	Count
Strongly disagree	7%	13
Somewhat disagree	18%	35
Neither agree nor disagree	13%	25
Somewhat agree	30%	57
Strongly agree	33%	63

I feel that my age influences how I interact with technology. 193 ⓘ

Q17 - I feel that my age influences how I interact with technology.	Percentage	Count
Strongly disagree	4%	8
Somewhat disagree	13%	26
Neither agree nor disagree	22%	43

Q17 - I feel that my age influences how I interact with technology.	Percentage	Count
Somewhat agree	27%	53
Strongly agree	33%	63

My level of education influences how technology impacts my life. 194 ①

Q18 - My level of education influences how technology impacts my life.	Percentage	Count
Strongly disagree	7%	13
Somewhat disagree	14%	27
Neither agree nor disagree	21%	41
Somewhat agree	37%	71
Strongly agree	22%	42

Because of my experience with technology, I am able to better manage my mental health. 194 ①

Q19 - Because of my experience with technology, I am able to better manage my mental health.	Percentage	Count
Strongly disagree	4%	8
Somewhat disagree	14%	27
Neither agree nor disagree	21%	40
Somewhat agree	27%	53
Strongly agree	34%	66

Scrolling social media without engaging often leaves me feeling unsatisfied. 194 ①

Q20 - Scrolling social media without engaging often leaves me feeling unsatisfied.	Percentage	Count
Strongly disagree	7%	14
Somewhat disagree	7%	13
Neither agree nor disagree	18%	35
Somewhat agree	34%	66
Strongly agree	34%	66

I get a sense of accomplishment when I produce or share stuff on social media. 193 ①

Q21 - I get a sense of accomplishment when I produce or share stuff on social media.	Percentage	Count
Strongly disagree	9%	18
Somewhat disagree	11%	21
Neither agree nor disagree	16%	31
Somewhat agree	37%	71
Strongly agree	27%	52

My mental health improves when I interact with friends or communities online. 193 ⓘ

Q22 - My mental health improves when I interact with friends or communities online.	Percentage	Count
Strongly disagree	4%	8
Somewhat disagree	12%	23

Q22 - My mental health improves when I interact with friends or communities online.	Percentage	Count
Neither agree nor disagree	22%	43
Somewhat agree	44%	84
Strongly agree	18%	35

Passively seeing other people's content makes you feel more anxious or inferior. 193 ⓘ

Q23 - Passively seeing other people's content makes you feel more anxious or inferior.	Percentage	Count
Strongly disagree	6%	11
Somewhat disagree	13%	25
Neither agree nor disagree	13%	26
Somewhat agree	35%	68
Strongly agree	33%	63

Active participation online helps me build meaningful connections with others. 193 ⓘ

Q24 - Active participation online helps me build meaningful connections with others.	Percentage	Count
Strongly disagree	3%	6
Somewhat disagree	17%	33
Neither agree nor disagree	16%	30
Somewhat agree	27%	52
Strongly agree	37%	72

Appendix B



This is to certify that

Project No.: **DDMKT2025-6-171002**

Project Title: **Unplugging the Mind: Examining the Psychological Costs of Technology**

Principal Researcher: **Mijail Naranjo**

according to the regulations of the Ethics Committee of NOVA IMS and MagIC Research Center this project was considered to meet the requirements of the NOVA IMS Internal Review Board, being considered **APPROVED** on 6/17/2025.

It is the Principal Researcher's responsibility to ensure that all researchers and stakeholders associated with this project are aware of the conditions of approval and which documents have been approved.

The Principal Researcher is required to notify the Ethics Committee, via amendment or progress report, of

- Any significant change to the project and the reason for that change;
- Any unforeseen events or unexpected developments that merit notification;
- The inability of the Principal Researcher to continue in that role or any other change in research personnel involved in the project.

Lisbon, 6/17/2025

NOVA IMS Ethics Committee
ethicscommittee@novaims.unl.pt