



American Journal of Education and Technology (AJET)

ISSN: 2832-9481 (ONLINE)

VOLUME 5 ISSUE 3 (2026)



PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Digital Device Usage Patterns and Psychological Well-Being Among University Students: A Systematic Literature Review and Implications for Machakos County, Kenya

Mwunda Nicholus M¹*, Maingi Caroline M²

Article Information

Received: April 27, 2026

Accepted: July 02, 2026

Published: September 14, 2026

Keywords

*Digital Device Usage Patterns,
Mental Health, Psychological Well-
Being, Smartphone Use, Social
Media, University Students*

ABSTRACT

Digital technology has undergone enormous growth and has changed the way university students acquire knowledge, communicate, interact, and socialize with their friends. While it is undeniable that the usage of digital devices (smartphones, laptops, and tablets) and internet applications offers educational and social advantages for university students, there has been an increasing concern regarding its consequences on the psychological well-being of students. This study conducted a systematic review and meta-synthesis on existing research on the implications of digital device usage patterns on psychological well-being among university students in Machakos County, Kenya. Gratifications Theory, Cognitive-Behavioral Theory of Internet Use, and Social Comparison Theory were used to explore the relationships between different patterns of digital device usage and psychological well-being. A Systematic Literature Review (SLR) approach was adopted which followed the PRISMA 2020 framework. The search was conducted through Scopus, Web of Science, PsycINFO, ERIC, PubMed, and Google Scholar databases for peer-reviewed papers between the years 2020 and 2026. Data was then synthesized using thematic synthesis method. The study found that digital device usage patterns significantly influence university students' psychological well-being. Moderate, purposeful use of digital devices enhanced academic productivity, strengthened social connectedness and increased knowledge sharing among students, thus improving their psychological well-being. However, addictive and problematic usage of smartphones, social media sites, and internet applications was consistently linked to higher stress, anxiety, and depression levels, psychological distress, sleep disorders, and academic impairment. Furthermore, the review established that an individual's motivational intent in the usage of digital devices, emotional coping skills, and social comparison mechanisms are important factors that determine psychological outcomes of university students. The study concluded that by encouraging responsible and constructive use of digital devices and other mental health interventions, university students in Machakos County and higher education settings at large can improve their psychological well-being.

INTRODUCTION

The digital revolution over the last decade has been tremendous across the world. Digital technology has radically altered and transformed the way people communicate, learn, shop, socialize and work (Candussi *et al.*, 2023). Increasing access to internet services and affordable gadgets such as smartphones, laptops, and tablets has made communication and connectivity globally accessible, and these devices have become a fixture among university students whose daily lives revolve around these gadgets in academic, social, and leisure contexts (Sánchez-Fernández & Borda-Mas, 2023). Notwithstanding the vast educational and social benefits derived from these devices and related internet applications, great concern has been expressed by various stakeholders regarding their impact on the psychological well-being of students (Santos *et al.*, 2024). However, while it is established that excessive usage of digital devices leads to deterioration in students' psychological well-being, an increasing trend has also emerged. Mental health support systems are using digital technology to combat this challenge among students in universities (Ferrari *et al.*, 2022).

Existing empirical findings drawn from Europe, North America, Asia and other global regions demonstrate that there are both positive and negative consequences of digital device usage among university students. Digital technologies have been instrumental in increasing access to learning resources and opportunities; facilitating learning as well as communication and thus strengthening students' social interactions and connections with their peers (Petersen *et al.*, 2023). Conversely, growing concern has been reported regarding negative psychological outcomes resulting from problematic use of digital technologies. According to Du *et al.* (2024), frequent use of social networking and internet applications is strongly correlated with psychological stress and distress among young adults. More so, it is an active and widely-discussed issue around the world how fear of missing out, prolonged screen exposure and excessive online connection affects psychological well-being, sleep and social well-being (Groenestein *et al.*, 2024).

The African continent has rapidly embraced digital technology driven by enhanced access to the internet, affordability of smart devices and expanded mobile

¹ Department of Computing and Information Technology, Machakos University, School of Engineering and Technology, Kenya

² Machakos University, School of Education, Department of Psychology and Special Needs Education, Kenya

* Corresponding author's e-mail: nmwunda@mksu.ac.ke

network coverage. In this technological landscape, it is impossible to avoid mentioning the revolutionary effects it has had in the life of young people and students in universities in particular. Their academic, social and daily activities largely depend on the extensive use of smart devices (laptops, phones) and internet services. Studies in Sub-Saharan Africa are consistent in pointing out that while the use of smart devices yields positive effects among students in higher education institutions, a significant negative impact on their psychological well-being has been noted (Kituyi & Kyeyune, 2024). This has been attributed to the use of the internet for entertainment and social interactions which has been correlated with increased level of stress, depression and anxiety. On the other hand, the impact of digital technology is now a leading subject and has a wide research interest among African scholars in the development of mental health support services (Mudau *et al.*, 2024). It also poses the threat of digital addiction, cyberbullying and other psychological negative consequences (Kizito *et al.*, 2025). East Africa region has recently witnessed enormous digital transformations due to increase in the coverage of internet service and mobile network, acquisition of smart phone technology and investments into ICT infrastructure. Consequently, Kenya, Uganda, Tanzania and Rwanda for instance, have seen massive development of digital learning resources and widespread use of internet services especially in universities (Bitegeko & Seni, 2025). Studies have also shown that through the internet and the increased use of smart devices, the capacity of students in universities to easily share and acquire relevant learning information and to maintain close social ties has been significantly strengthened and this leads to improvements in psychological well-being (Oyoo *et al.*, 2024). On the other hand, however, research indicates that the prevalence of social networking usage among students in these countries has contributed to increased levels of stress, depression and other forms of emotional strain (Kituyi & Kyeyune, 2024). While the subject of digital technology has caught the attention of scholars, more research needs to be conducted on the effect of smart device usage patterns on students' psychological well-being among countries in East Africa. In Kenya, both mobile phone and internet penetration have grown rapidly due to better telecom infrastructure and the affordability of smartphones. This digital advancement has had a considerable impact on higher education in Kenya, with university students using digital devices for academic work, communication, and social interactions. Research conducted in Kenyan universities, suggests that excessive use of smartphones and social media has been linked to stress, anxiety, and lower levels of well-being (Wanjiru *et al.*, 2025). Furthermore, students with problematical use of smartphones have higher levels of mental health problems and poorer academic concentration (Kemuma, 2021). Similarly, student's mobile phone use is influenced by cognitive and social factors (Wasiaya *et al.*, 2023). However, there is a

lack of synthesis of digital device usage patterns among students and their association with psychological well-being among Kenyan university students.

Machakos County, is home to various universities and colleges. Students attending these institutions are from various socio-cultural backgrounds, and they rely heavily on digital devices (laptops and smartphones) for learning, communication, and networking. The prevalence of this digital advancement coincides with students' psychological well-being concerns, including the existence of stress and other mental health issues in Kenyan universities (Mutiso *et al.*, 2023). Research indicates that mental health disorders and associated psychosocial challenges exist among students in Kenyan higher education, making students vulnerable (Mutiso *et al.*, 2022). At Machakos University, for instance, it has been shown that students engaged in risk-taking behaviors in the digital environment (Musyimi *et al.*, 2018). In Machakos County, specific research examining digital device usage patterns and psychological well-being is scarce.

Digital device usage patterns are defined as the nature of engagement, frequency, extent, purpose, and intensity of student's interaction with devices like laptops and smartphones for academic, social, and entertainment-related tasks. Psychological well-being, in this case, refers to an individual's social, cognitive, and emotional functioning, which is measured through levels of satisfaction, stress and mental health state. The relationship between these two variables can be explained through the theory of gratification and problematic usage. These theories explain how students use of devices may either promote psychological well-being or reduce it based on the reasons and methods of use. For example, social or academic use can have a positive effect, while excessive use can result in negative outcomes (Katz *et al.*, 1973). According to these theories, students actively use digital devices to gratify needs, while a problematically use can result in poor well-being due to negative thoughts about the devices or an upward social comparison (Davis, 2001; Festinger, 1954).

Despite being a globally recognized issue, empirical studies exploring the link between digital device use and students' psychological well-being are yet to comprehensively cover all aspects and populations. Majority of the studies focused on developed countries, with a scarcity of literature on African context, and even much lesser from East African regions, particularly Kenya. The research conducted on students in Kenya mostly focused on smartphone addiction and general mental health among the students. Very little research has focused on the consolidation of the different types of digital device usage among students. Furthermore, research conducted in Machakos County did not examine the relationship between different digital device usage patterns and the psychological well-being of university students. Synthesizing information from other wider contexts, the study addresses research gaps and offers recommendations to guide future research and interventions concerning learners' psychological well-

being in Machakos County. This study therefore aimed to fill the gap that exists in both conceptual population and methodological perspectives and provide relevant findings that will contribute to university students' psychological well-being enhancement, counseling psychology services, higher education policies and intervention development in Machakos County.

Statement of the Problem

University students are expected to efficiently employ the usage of their digital devices like laptops, smartphones and internet access in the betterment of their academic performance, social relations and personal psychological well-being while maintaining desirable levels of use. However, current evidence shows increasing concerns about the over use of digital devices among students and associated poor psychological well-being. In Kenya, there is documented evidence indicating that the majority of students face problems related to their psychological well-being. There are also National reports on stress levels among students that is mostly linked with smartphone use and internet access that over one-third of students have moderate to severe stress levels (Mutiso *et al.*, 2023). Also, there is evidence of students experiencing mental health issues such as insomnia and anxiety with long time use of screen devices, and reduced concentration (Kemuma, 2021). Studies conducted in Machakos County have also shown that students have high levels of problematic use and maladaptive behaviours in the use of the internet, and they are faced with problems of psychosocial functioning (Musyimi *et al.*, 2018). If not managed, poor digital device use among students would compromise their overall psychological well-being, lead to poor academic results, poor social relations and poor performance. Hence there is a knowledge gap on the specific digital device usage patterns and psychological well-being of university students in Machakos County that this study aimed to address.

Purpose of the Study

The purpose of this study was to systematically review and synthesize existing literature on the impact of digital device usage patterns on psychological well-being among university students in Machakos County, Kenya.

LITERATURE REVIEW

Digital devices are an integral part of students' lives, in both academic and social dimensions. Students can access learning materials and engage with friends and social networks through various digital tools such as smartphones, laptops and tablets, connected via various internet services. As a result, students are considered to be among the most digitally-saturated population worldwide. While digital devices have become a primary means of interaction and learning among students, there is growing concern over problematic usage patterns including excessive time spent on devices, constant checking behaviors, heavy dependency on smartphones,

and maladaptive internet use. A systematic review on problematic smartphone use among young adults by Busch and McCarthy (2021) found that psychological, social, and behavioral factors predict such problematic use. Problems related to smartphone use included self-regulation, emotional problems, poorer academic performance, sleep disturbance and lower well-being. Similarly, according to a review of studies on the issue of problem smartphone use in higher education, Sánchez-Fernández and Borda-Mas (2023) reported that problematical smartphone use has an increasing prevalence in universities all around the world and is influenced by social networking, search for entertainment, need for emotional regulation and fear of missing out. The increase in digital technologies, hence, has reshaped digital device use beyond that of functionality into an experience characterized by various behaviors with significant impacts on students' adjustment and psychological well-being.

The concept of smartphone addiction has received significant attention from both psychology and education researchers. This condition is described as excessive, compulsive and lack of control of smartphone use, leading to problems in the daily functioning, social relationship, academics and mental health. In their systematic review on the link between smartphone addiction and health outcomes, Ratan *et al.* (2021) found that problematic smartphone use is significantly related to anxiety, depression, stress, insomnia and lower quality of life and concluded that the use of smartphone beyond the limit is a critical issue that should not be ignored especially for young people and students.

In their study of problematic smart phone use among students from 2012 to 2022, Lu *et al.* (2024) also found a substantial and worldwide increase of smartphone addiction globally especially among adolescents and college students. The study found psychological vulnerability, self-control and emotional regulation, and extensive use of social networks as the key predictors. Supporting the findings, Mostyn Sullivan and George (2023) found that motivational aspects played a key role in relation to problematical smartphone use, noting that although smartphone is used for entertainment and social connections, for coping with emotions, which may be useful at initial stage, they tend to be used compulsively as a part of dependence over time which in turn may lead to worse well-being. These studies highlighted the negative impact of problematic smartphone use on psychological well-being of students.

Social media have become an essential tool for students to engage in daily life as a part of interaction and identity formation process, it is widely used for maintaining social networks, sharing of information and experiences, and forming online communities among students. However, there is also growing concerns regarding its negative effects on students' well-being. In their study exploring the link between social media use and psychological well-being, Zhang *et al.* (2023) showed that the use of social media has dual effects on both subjective and

psychological well-being through complex psychological pathways. Their results indicated that appropriate use of social media may promote social connectedness and life satisfaction. On the contrary, excessive use of social media may cause psychological exhaustion and contribute to reduced psychological well-being as well as lower life satisfaction, through negative social comparison. Similarly, Wu *et al.* (2024) reported that both loneliness and problem social media use were mutually causative among students, as loneliness led to increased problematic social media use while more intensive use of social media intensified feelings of loneliness and social isolation. Hence, even if social media is used for satisfying needs for social connection, it might lead to negative outcomes on psychological well-being of students if they become overly reliant on it for interactions. Therefore, the use of social media may both have positive and negative effects depending on the context, intensity and specific behaviors.

The results from Abellana *et al.* (2024) demonstrated a negative association between college students' fear of missing out (FoMO) and self-esteem and emphasized the role of sociality as digitally mediated. Dacay *et al.* (2024) used the Health-Promoting Lifestyles Scale and discussed the impact of lifestyle on the well-being of college students. Despite their useful contributions to understanding how the university student population experiences psychological and behavioral issues, these previous studies did not take into account the holistic picture of how various patterns of digital device use affect psychological well-being. Accordingly, the present research builds on current evidence by integrating multiple aspects of digital device use and their impact on students' psychological well-being.

Similarly, smartphones, internet use among students have increased dramatically due to its accessibility and wide range of application, but there has also been concerns about problematic internet use as an emerging phenomenon within universities. In a systematic review examining the issue of problematic internet use among university students, Snchez-Fernndez and Borda-Mas (2023) found that it was associated with various psychological consequences including anxiety, depression, loneliness, poorer academic performance, sleeping disturbances and lower life satisfaction. In particular, problematic use behaviors were particularly associated with online social networking, gaming, stream-watching and obsessive browsing. The researchers pointed out the bi-directional effect of psychological distress to problematic internet use, which in turn worsened the psychological symptoms of students. Their findings also emphasized the need for intervention programs targeting healthy and responsible use of the internet among students. These findings further support the growing concerns over psychological impacts related to various digital devices used by students. The findings presented evidence that problematic use of digital devices (smartphones, social media and the internet) has been consistently linked to the deterioration

of university students' psychological well-being, including increased anxiety, depression, stress, loneliness, sleep disturbance, and poorer academic functioning. The research indicates that the impacts of digital device use on students' well-being are influenced by the pattern and style of their engagement with the devices, as well as by factors such as the motive to use devices, self-regulation skills, and environment where they interact with digital devices. At the same time, evidence suggests that while an over-reliance on digital devices may contribute to adverse outcomes, the use of technology for purposes such as connecting with others, access to information and academic work, if done in moderation, could provide positive contributions to students' experiences.

One of the limitations of the literature is that most of the studies have been conducted in the Western and Asian context and there is limited evidence from African and Kenyan university populations. In addition, numerous studies have been conducted on the issue of smartphone addiction or social media usage but haven't looked at the usage of wider digital devices. This creates a conceptual and contextual gap on the role of the various types of digital engagement on university students' psychological health in Kenya with a specific focus on Machakos County.

Theoretical Foundation

Uses and Gratifications Theory

The uses and gratifications theory developed by Katz, Blumler, and Gurevitch (1973), proposes that people actively seek media and communication technologies to meet certain psychological/psychosocial needs. The theory differs from traditional media theories which assumed that media users were passive recipients of messages by giving credit to the freedom of the users to choose and use media in their consumption.

University students use digital devices to meet their needs for information, communication, entertainment, social interaction, academic learning and emotional support. The theory proposes that children will actively use digital technologies if they believe that they can produce desired outcomes. This theory is relevant to the current study because it was used to explain why University students have certain behaviours in relation to the use of digital devices. It also offered a structure to help explain the potential impact of various motives for using digital technologies on psychological health.

Cognitive-Behavioral Theory of Problematic Internet Use

According to Davis (2001), the cognitive-behavioral theory of problematic internet use suggests that negative thoughts play a role in the development of problematic internet usage. The theory proposes that people with dysfunctional beliefs, emotional sensitivities or psychological issues can use digital technologies as coping tools. It posits that overuse of the internet and cell phone often stems from deeper cognitive distortions

and emotional issues. These behaviors get reinforced over time, and can result in dependency and negative psychological effects such as anxiety, depression, loneliness and emotional distress. This theory was relevant because it illustrates how the use of digital devices can be a problem for university students and how it can have a negative influence on their psychological health.

Social Comparison Theory

This theory was developed by Festinger's (1954) and suggests that people compare their abilities, achievements and personality to others. In the modern digital world, social media offers constant avenues for social comparison; with access to carefully-filtered images, achievements, and lifestyles. When a university student frequently compares himself/herself to others at a higher socioeconomic status, he or she may feel bad, experience low self-esteem, become discontent, anxious and suffer from poor psychological health. On the other hand, positive social interactions and supportive online relationships can boost self-esteem and emotional health. The theory thus offered an important explanation for the potential relationship between the use of social media and psychological well-being in the context of comparison processes and self-evaluative mechanisms.

Theoretical Integration and Relevance to the Study

These three theories offered a complete picture of the relationship between use of digital devices pattern and psychological well-being among university students. Uses and Gratifications Theory helped to explain why students use digital technologies; Cognitive-Behavioral Theory helped to explain how maladaptive patterns of use may emerge and lead to psychological distress; and Social Comparison Theory helped to explain how interactions with digital technologies contribute to psychological distress. These theories together imply that psychological well-being is a function of digital engagement frequency and not just digital engagement itself. It is also a function of the motives, cognitive processes, and social experiences to which digital engagement is tied. This all-encompassing theoretical framework thus gives a solid basis to study digital device usage patterns and psychological wellbeing of University students in Machakos County, Kenya.

MATERIALS AND METHODS

Research Design

The study adopted a Systematic Literature Review (SLR) design to synthesise existing evidence on digital device usage patterns and psychological well-being among university students. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 guidelines to ensure a rigorous, transparent, and reproducible review process (Page *et al.*, 2021). The review covered studies published between 2020 and 2026, with the findings interpreted to establish implications for university students in Machakos County, Kenya.

Data Sources and Search Strategy

A comprehensive literature search was conducted between 1 May and 30 June 2026 using Scopus, Web of Science, PsycINFO, ERIC, PubMed, and Google Scholar. The search used combinations of keywords including digital device use, smartphone use, social media use, internet use, screen time, psychological well-being, mental health, and university students, combined using Boolean operators AND and OR. The search yielded 1,248 records, comprising Scopus (286), Web of Science (214), PsycINFO (176), ERIC (148), PubMed (239), and Google Scholar (185). After removing 318 duplicate records, 930 records remained for screening.

Inclusion and Exclusion Criteria

Peer-reviewed empirical studies published in English between 2020 and 2026 were included if they examined digital device use and psychological well-being or mental health among university or college students. Studies involving non-university populations, lacking relevant psychological well-being outcomes, not examining digital device use, or published as editorials, conference papers, unpublished reports, or non-peer-reviewed materials were excluded.

Study Selection and Quality appraisal

The study selection followed the PRISMA 2020 process. Of the 930 records screened, 823 were excluded following title and abstract screening, leaving 107 full-text articles for eligibility assessment. Eighty-two articles were excluded because they involved inappropriate populations (27), lacked relevant psychological well-being outcomes (21), did not focus on digital device use (16), were not peer-reviewed empirical studies (10), or lacked sufficient information for data extraction (8). Consequently, 28 studies were included in the final review. The selection process was presented in a PRISMA 2020 flow diagram. The methodological quality of the included studies was assessed using appropriate Joanna Briggs Institute (JBI) Critical Appraisal Tools. Of the 28 studies, 18 were rated as high quality and 10 as moderate quality.

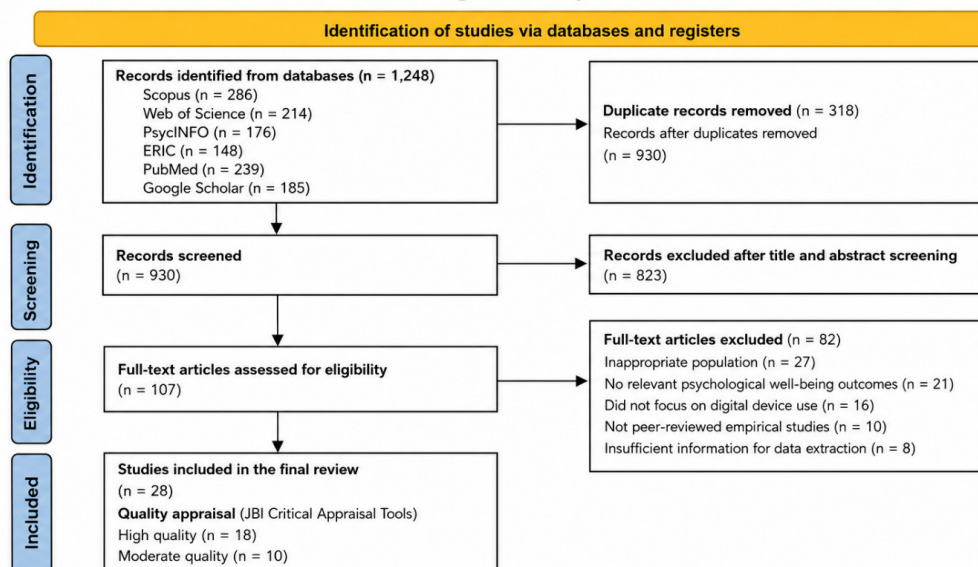
Ethical Considerations

There was no need for ethical approval as only published literature was used. Academic integrity, however, was ensured by proper citation, APA 7th Edition guidelines and accurate reporting of findings.

Findings and Discussion

The review of literature found similar evidence to conclude that pattern of digital device usage among the university students significantly relates to psychological well-being outcomes. Three main findings were revealed in the reviewed studies: problematic smartphone use is a major predictor of psychological distress, social media engagement is a dual factor for both well-being and maladaptive psychological outcomes; and patterns of internet use influence both adaptive and maladaptive

PRISMA 2020 Flow Diagram for Systematic Literature Review



Source: Adapted from Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Murow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:n71. doi: [10.1136/bmj.n71](https://doi.org/10.1136/bmj.n71)

psychological outcomes. The results also suggest that psychological wellbeing is not just affected by the amount of digital device use, but by intrinsic motivations, emotional control mechanisms, and behavioral dependency patterns.

Problematic Smartphone Use and Psychological Distress

It was noted that problematic smartphone use is closely linked with negative psychological consequences in the literature. The study by Busch and McCarthy (2021) associated excessive smartphone use with anxiety, depression, sleep problems, lower self-control and academic performance. The results indicated that smartphone overuse is not only a behavior but a psychological multidimensional problem of the emotional, cognitive and social aspects of smartphone use.

Likewise, Ratan *et al.* (2021) found that smartphone addiction is highly correlated with a decrease in psychological well-being especially in young adults and university students. In a systematic review, the study found high links between heavy use of smartphones and stress-related symptoms, loneliness, and diminished life satisfaction. Often accompanied by hypervigilance of checking and failure to unplug from phones.

Lu *et al.* (2024) continue this trend with a global trend analysis that reveals an increase in problematic smartphone use from 2012 to 2022. The research showed that psychological vulnerability, impulsivity and emotional regulation are the most important predictors of smartphone addiction. It is important to note that among the population at high-risk are the university students, as a result of academic pressure, societal demands and being constantly connected. In general, the findings indicate

that excessive smartphone use is a significant risk factor for mental health issues, especially when it becomes obsessive and disrupts everyday life.

Motivations for Use and Psychological Outcomes

In addition to the frequency of use, literature emphasizes underlying motives in determining psychological effects of using computers. Mostyn, Sullivan and George (2023) highlight that the motivations for student's smartphone use include social connection, leisure, coping with stress, and avoiding negative emotions. These motivations may have adaptive functions at the beginning but if the smartphones are used as coping tools, there is the risk of dependency.

This is consistent with cognitive-behavioral viewpoints, which propose that unfavorable coping mechanisms can sustain the tendency to overuse digital technology. As the use of cell phones for emotional regulation becomes more common over time, so do the number of people who are less resilient and are more susceptible to psychological distress. The results, therefore, suggest that motives of use are significant predictors of psychological outcomes as well as intensity of use.

Social Media Use, a Dual-Pathway Influence

The studies reviewed showed that social media use can have positive and negative impact on psychological well-being, depending on its usage patterns and psychological context. Based on this, Zhang *et al.* (2023) indicated that the use of social media can positively impact on subjective well-being through the sense of social connectedness, communication, and access to social support. The same study, however, indicated that more involvement is linked to psychological distress via social comparison, emotional exhaustion, and lower self-esteem.

Another study by Wu *et al.* (2024) suggests that there is an interdependency between loneliness and problematic social media use. The longitudinal results showed that lonely students are more prone to using social media a lot, and the more they use it over time, the more lonely they feel. It is a cyclical nature, meaning that social media can also be a symptom of and at the same time be a cause of psychological vulnerabilities. The overall findings suggest a two-way model of how social media can contribute to well-being through connectivity, and how it can detract from well-being from over-exposure and/or dysfunctional psychological processes.

Problematic Internet Use and Academic-Psychological Functioning

The other important theme that was observed in the literature is the negative effect of problematic internet use on psychological and academic performance. Sánchez-Fernández and Borda-Mas (2023) discovered that university students who use the internet excessively are at risk of experiencing depression, anxiety, sleep problems, and academic underachievement. The review also highlights that problematic internet use tends to be associated with other behaviors such as social networking, online gaming, and compulsive Internet use. These activities add to time displacement, loss of productivity, and emotional dysfunction.

More importantly, the authors explained the cyclical nature of the relationship between psychological distress and Internet use. Individuals who have emotional issues are at higher risk to use the internet in excess to cope with these issues, thereby compromising their psychological status. This helps to implement the behavioral reinforcement cycle suggested by cognitive-behaviour theory.

Integrated Patterns Across Studies

The literature reviewed showed that the use of digital devices has negative psychological impacts, both directly and indirectly. The direct impacts are an increase in stressor exposure (social comparison, information overload, sleep disruption). Indirect effects include psychological mechanisms, including emotional regulation deficits, dependency behaviors, and reinforcement cycles. In all studies, university students were identified as a very vulnerable group because they are in their developing years, have academic pressures, and are highly exposed to digital environments. The results across all studies were consistent that excessive and/or out-of-control digital engagement is linked to poorer psychological outcomes, whereas moderate and purposeful engagement is linked to neutral or positive outcomes.

Contextual and Research Gaps

The reviewed studies offer robust evidence at the global level, but there are some gaps in the evidence. Firstly, most of the research is focused on the contexts of the West and of Asia, and few studies focus on Africa. Second, many studies limit their analyses to smartphone addiction or

social media use, rather than a wider construct of patterns of digital device use. Third, most studies are cross-sectional in design and do not allow for causal inferences. Furthermore, little research has been conducted on how digital devices use patterns function in specific socio-cultural contexts, especially in Kenya. This leaves a huge context difference on the understanding and reactions to digital engagement in relation to psychological well-being among University students in Machakos County.

Discussion of Findings

The results of this systematic literature review revealed a strong link between digital device use patterns and psychological well-being among university students. The three broad themes found in the reviewed studies are problematic smartphone use, social media use, and behaviors related to using the internet. These patterns suggest that the use of digital technologies is vital to academic and social life, but they are associated strongly with negative psychological consequences, including increased stress, anxiety, depression, feelings of loneliness, sleep difficulties and performance in school.

One of our main findings is that one of the most important factors associated with psychological distress is problematic smartphone use. For instance, in the studies conducted by Busch and McCarthy (2021) and Ratan *et al.* (2021), it was found that compulsive use of the smartphone has an impact on emotional regulation, sleep quality and academic engagement. This may be attributed to cognitive-behavioural mechanisms, which involve the reinforcement of smartphone checking behaviours, leading to dependency loops and decreasing the ability to control behaviours. From a theoretical perspective, this is consistent with Davis' cognitive-behavioral theory on problematic internet use, which proposes that problematic use of the internet is related to maladaptive cognitions and coping strategies.

The study also found that the use of social media has both negative and positive impact on psychological well-being. When it comes to the role of social media in improving well-being, Zhang *et al.* (2023) demonstrated that social media can boost well-being by fostering social connectedness and communication. However, Wu *et al.* (2024) provided evidence that overuse of social media over time leads to loneliness and emotional distress. This dual effect can be understood in the terms of Social Comparison Theory, which suggests a process of self-evaluation on the basis of imaginative comparisons with manipulated online representations of others. Excessive upward comparisons can lead to low self-esteem and a sense of vulnerability, especially for university students who are in a pivotal developmental phase of identity development.

Another significant finding is that problematic internet use is correlated with school and emotional issues. Excessive internet use is associated with lower academic achievement, anxiety, and depressive symptoms (Sánchez-Fernández & Borda-Mas, 2023). Internet use itself is not

a problem, but rather the unmanaged and emotionally charged interaction with it is a problem. This reflects the Uses and Gratifications Theory which states that people seek to use media to meet psychological needs. When these needs are emotional (escape, avoidance or coping), however, they can escalate to a level of excessive and maladaptive use.

Psychological vulnerability and emotional regulation deficits were key cross-cutting issues identified in the review. It is noteworthy that as described by Lu *et al.* (2024), people who have poor emotional control and have a high level of impulsivity have higher chances of developing problematic smartphone behaviors. This indicates that the use of digital devices is not independent but rather influenced by psychological traits. Digital devices can serve as coping tools for students who are facing stress and/or loneliness, leading to a vicious cycle of reliance and psychological challenges.

The results also indicate that the intensity of usage is not enough to account for psychological outcomes. Motivations for use are very important in deciding whether use of digital devices is good or bad. Mostyn Sullivan and George (2023) found that students that report using the smartphone for emotional coping or avoidance tend to have negative outcomes, whereas those who use it for academic or social support have a better outcome. This illustrates the difference between healthy and unhealthy online interaction. In general, the results indicate that university students are very vulnerable from developmental, academic and social pressures. Overuse, stress and psychological pressures are common as students move into their adult years, with the constant stimulation they have received from technology and schoolwork. This is especially important in today's digital world where students are expected to have access to a digital device at all times for educational, social and professional needs.

Even with all the evidence at the global level, the review points out that there is a huge contextual gap for African and Kenyan based research. Existing studies are mostly carried out in western and Asian cultures, which makes it difficult to generalize to the context of Machakos County. Digital device usage patterns and psychological outcomes can be affected differently by socio-cultural, economic and educational differences. Consequently, the purpose of local research is to gain insight into the nature of Kenyan university students' experience of and navigation through digital environments.

Finally, the discussion validates that the use of digital devices can have a complicated and multidimensional relationship with psychological well-being. There is a wide range of opinions on whether moderate and purposeful uses can improve connectivity and learning, or whether excessive and emotionally driven uses are consistently related to psychological distress. The results highlight the need to encourage digital literacy, emotional control, and the proper use of technology among university students.

CONCLUSION

The study concludes that the effect of digital device

use patterns on psychological wellbeing of University students in Machakos County, Kenya have implications for understanding how digital engagement affects mental health in the local Higher Education context. The results suggest that the use of digital devices has a significant influence on the psychological well-being of the university students in Machakos County, although most of the evidence is based on international research. Universities in Machakos County, therefore, are at risk of similar trends. Increased smartphone and social media usage alongside internet use lead to high levels of stress, anxiety, loneliness and academic distraction.

The findings also suggest that universal access to technology does not affect the psychological health of university students, but rather how digital devices are used. Students who use devices mostly for academic learning and/or in positive social interactions will likely have higher levels of wellbeing than students who use devices in ways that are not controlled or are excessive or emotionally driven.

The review showed that digital environments in universities in Machakos County indirectly may be contributing to mental health challenges. Students may experience more cognitive overload, emotional fatigue and sleep disruption due to continuous connectivity, academic demands via digital channels and exposure to social media. Finally, the results suggest that there is a lack of local evidence in Machakos County so that decisions on policy and institutionality could be made using generalized global or national information. This necessitates specific ICT and mental health strategies that are context specific and focused on students from this area.

Recommendations for Practice

- Kenyan universities should formulate and implement structured guidelines for use of the ICTs in a balanced way. These policies should guide students on how to safely use their smartphones, social media and online learning platforms to help minimize overdependence and digital fatigue.

- Digital well-being aspects, including digital time limits, reminders and structured online learning time should be built into institutional ICT systems. These features can assist students in managing their online interactions and mitigating mental fatigue.

- Counselling services and ICT departments need to work together to help students who are at risk of overusing ICT and experiencing psychological distress. Provision for early intervention to help students who are feeling anxious, stressed or lonely as a result of their excessive digital use should be put in place.

- Digital literacy and mental health awareness should feature in University programs on:

- Using smartphones and the internet in a healthy and appropriate way, the dangers of overuse of screens, social comparison and self-esteem impacts.

- There should be the coordination of lecturer and ICT administrators to make sure that digital academic

demands do not add to overload. This involves managing workload from online activities, minimizing unnecessary notifications and encouraging flexible learning times, if feasible.

Recommendations for Policy

The education stakeholders at county/Institutional level should consider incorporating digital well-being education in Higher Education policies in Machakos County. This may be done by including digital mental well-being awareness in University Quality Assurance systems and creating interventions for students' mental health at the county level, in relation to the use of digital devices.

Recommendations for Future Research

Future studies should:

- Empirically investigate in the universities in Machakos County to obtain evidence relevant to the County context
- Explore gender, socio-economic and age variations in digital usage behaviour.

REFERENCES

- Abellana, C. J. P., Mendez, A. M. H., Subido, G. M. V., & Culajara, C. L. (2024). The social comparison trap: Association between fear of missing out (FOMO) and self-esteem in college students. *American Journal of Human Psychology*, 2(1), 114–120. <https://doi.org/10.54536/ajhp.v2i1.2807>
- Bitegeko, R. M., & Seni, A. J. (2025). Unpacking the value-effect gap: University students' engagement with social media in academic and social context. *Educational Dimension*, 1065, 1–18. <https://doi.org/10.55056/ed.1065>
- Busch, P. A., & McCarthy, S. (2021). Antecedents and consequences of problematic smartphone use: A systematic literature review of an emerging research area. *Computers in Human Behavior*, 114, 106414. <https://doi.org/10.1016/j.chb.2020.106414>
- Candussi, C., Kabir, R., & Sivasubramanian, M. (2023). Problematic smartphone usage, prevalence and patterns among university students: A systematic review. *Journal of Affective Disorders Reports*, 14, 100643. <https://doi.org/10.1016/j.jadr.2023.100643>
- Dacay, N. J. B., Rañon, J. G., & Culajara, C. L. (2024). Examining the health-promoting lifestyle of college students: A quantitative analysis. *American Journal of Human Psychology*, 2(1), 93–103. <https://doi.org/10.54536/ajhp.v2i1.2823>
- Davis, R. A. (2001). A cognitive-behavioral model of pathological Internet use. *Computers in Human Behavior*, 17(2), 187–195. [https://doi.org/10.1016/S0747-5632\(00\)00041-8](https://doi.org/10.1016/S0747-5632(00)00041-8)
- Du, M., Zhao, C., Hu, H., Ding, N., He, J., Tian, W., Zhao, W., Lin, X., Liu, G., Chen, W., Wang, S., Wang, P., Xu, D., Shen, X., & Zhang, G. (2024). Association between problematic social networking use and anxiety symptoms: A systematic review and meta-analysis. *BMC Psychology*, 12, 263. <https://doi.org/10.1186/s40359-024-01705-w>
- Ferrari, M., Allan, S., Arnold, C., Eleftheriadis, D., Alvarez-Jimenez, M., Gumley, A., & Gleeson, J. F. (2022). Digital interventions for psychological well-being in university students: Systematic review and meta-analysis. *Journal of Medical Internet Research*, 24(9), e39686. <https://doi.org/10.2196/39686>
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7(2), 117–140. <https://doi.org/10.1177/001872675400700202>
- Groenestein, E., Willemsen, L., van Koningsbruggen, G. M., Ket, H., & Kerkhof, P. (2024). The relationship between fear of missing out, digital technology use, and psychological well-being: A scoping review of conceptual and empirical issues. *PLOS ONE*, 19(10), e0308643. <https://doi.org/10.1371/journal.pone.0308643>
- Katz, E., Blumler, J. G., & Gurevitch, M. (1973). Uses and gratifications research. *The Public Opinion Quarterly*, 37(4), 509–523. <https://doi.org/10.1086/268109>
- Kemuma, J. H. (2021). *Relationship between problematic smartphone use and psychological distress among university students: A case study of Mount Kenya University*. University of Nairobi Repository (Thesis). <https://erepository.uonbi.ac.ke/handle/11295/160801>
- Kituyi, G. M., & Kyeyune, R. (2024). Social media and the mental health of university students in Sub-Saharan Africa. *BMC Public Health*, 24, Article 3201. <https://doi.org/10.1186/s12889-024-20707-2>
- Kizito, M., Kayongo, I., Nyende, H., Chongomweru, H., Muyama, L., Asiku, R. A., & Mugisha, A. (2025). *MakOne: Behavioural data of university students' smart devices in Uganda*. arXiv. <https://doi.org/10.48550/arXiv.2509.22334>
- Lu, X., An, X., & Chen, S. (2024). Trends and influencing factors in problematic smartphone use prevalence (2012–2022): A systematic review and meta-analysis. *Cyberpsychology, Behavior, and Social Networking*, 27(9). <https://doi.org/10.1089/cyber.2023.0548>
- Mostyn Sullivan, B., & George, A. M. (2023). The association of motives with problematic smartphone use: A systematic review. *Cyberpsychology. Journal of Psychosocial Research on Cyberspace*, 17(1), Article 2. <https://doi.org/10.5817/CP2023-1-2>
- Mudau, T., Jithoo, V., & Dietrich, J. (2024). Exploring the demand, practicality, and acceptability of a mental health application intervention for students at a South African university. *South African Journal of Psychology*, 54(2), 1–12. <https://doi.org/10.1177/00812463241249100>
- Musyimi, E. M., Kabue, P., & Mugo, J. (2018). Sexting and risky sexual behaviour among students in Machakos University, Machakos County, Kenya. *Global Journal of Health Sciences*, 10(5), 1–10. <https://doi.org/10.47604/gjhs.1154>
- Mutiso, V. N., Ndeti, D. M., Muia, E. N., & Musyimi, C. N. (2023). Students' stress patterns in a Kenyan socio-cultural and economic context: Toward a public health

- intervention. *Scientific Reports*, 13, 27608. <https://doi.org/10.1038/s41598-023-27608-1>
- Mutiso, V. N., Ndeti, D. M., Muia, E. N., Musyimi, C. N., Osborn, T. L., Swahn, M. H., & Mamah, D. (2022). Prevalence and perception of substance abuse and associated economic indicators and mental health disorders in a large cohort of Kenyan students: Towards an integrated public health approach and clinical management. *BMC Psychiatry*, 22, 191. <https://doi.org/10.1186/s12888-022-03817-2>.
- Oyoo, E., Zainabu, O., & Onyango, T. (2024). The power of smartphone use in enhancing psychological well-being of university students. *African Journal of Education, Science and Technology*, 8(1). <https://ajest.org/index.php/ajest/article/view/402>
- Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., McGuinness, L. A., Stewart, L. A., Thomas, J., Tricco, A. C., Welch, V. A., Whiting, P., & Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
- Petersen, B., Khalili-Mahani, N., Murphy, C., Sawchuk, K., Phillips, N., Li, K. Z. H., & Hebblethwaite, S. (2023). The association between information and communication technologies, loneliness and social connectedness: A scoping review. *Frontiers in Psychology*, 14, 1063146. <https://doi.org/10.3389/fpsyg.2023.1063146>.
- Ratan, Z. A., Parrish, A. M., Zaman, S. B., Alotaibi, M. S., & Hosseinzadeh, H. (2021). Smartphone addiction and associated health outcomes in adult populations: A systematic review. *International Journal of Environmental Research and Public Health*, 18(22), 12257. <https://doi.org/10.3390/ijerph182212257>.
- Sánchez-Fernández, M., & Borda-Mas, M. (2023). Problematic smartphone use and specific problematic Internet uses among university students and associated predictive factors: A systematic review. *Education and Information Technologies*, 28, 7111–7204. <https://doi.org/10.1007/s10639-022-11437-2>.
- Santos, R. M. S., Oliveira, G. B. de, Fernandes, F. M., Ventura, S. de A., Romano-Silva, M. A., & Miranda, D. M. de. (2024). Associations between smartphone use and mental disorders in college students: A systematic review. *International Journal of Research in Medical Sciences*, 13(1), 298–309. <https://doi.org/10.18203/2320-6012.ijrms20244130>
- Wanjiru, D., Ojuade, S. O., & Munda, P. O. (2025). Correlates of psychological distress and smartphone addiction among university students at Africa International University, Nairobi County, Kenya. *Journal of Sociology, Psychology and Religious*, 5(4), 33–43. <https://doi.org/10.70619/vol5iss4pp33-43> <https://edinburgjournals.org/journals/index.php/journal-of-sociology/article/view/515>
- Wasiaya, O. C., Serede, S. K., & Mberia, H. K. (2023). Cognition as a driving factor for mobile phone technology use among public university students in Nairobi, Kenya. *Archives of Business Research*, 11(4), 76–86. <https://doi.org/10.14738/abr.114.14391>
- Wu, P., Feng, R., & Zhang, J. (2024). The relationship between loneliness and problematic social media usage in Chinese university students: A longitudinal study. *BMC Psychology*, 12, 13. <https://doi.org/10.1186/s40359-023-01498-4>
- Zhang, C., Tang, L., & Liu, Z. (2023). How social media usage affects psychological and subjective well-being: Testing a moderated mediation model. *BMC Psychology*, 11, 286. <https://doi.org/10.1186/s40359-023-01311-2>