

The Impact of Electronic Device Use on Students' Academic Performance and Daily Activities

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ABSTRACT

This study aimed to explore the influence of electronic device use on the academic performance and daily activities of students in the Electrical Engineering Study Program at Politeknik Negeri Sriwijaya. A qualitative descriptive approach was employed involving six students aged 18–22 years who were selected through purposive sampling. Data were collected through semi-structured interviews and group discussions and analyzed using thematic analysis. The findings revealed that electronic devices contributed positively to academic activities by improving access to learning materials, facilitating communication, and supporting students' understanding of course content. However, participants also reported several challenges associated with prolonged device use, including eye strain, physical fatigue, reduced concentration, technology dependence, and changes in social interaction patterns. Overall, the findings indicate that electronic devices have become integral to students' academic and daily lives. While these technologies provide substantial educational benefits, their effective use requires balanced and responsible engagement to minimize potential physical, psychological, and social consequences.

Penelitian ini bertujuan untuk mengeksplorasi pengaruh penggunaan perangkat elektronik terhadap kinerja akademik dan aktivitas sehari-hari mahasiswa Program Studi Teknik Elektro di Politeknik Negeri Sriwijaya. Penelitian menggunakan pendekatan kualitatif deskriptif dengan melibatkan enam mahasiswa berusia 18–22 tahun yang dipilih melalui teknik purposive sampling. Data dikumpulkan melalui wawancara semi-terstruktur dan diskusi kelompok, kemudian dianalisis menggunakan analisis tematik. Hasil penelitian menunjukkan bahwa perangkat elektronik memberikan kontribusi positif terhadap aktivitas akademik melalui kemudahan akses terhadap sumber belajar, peningkatan komunikasi akademik, dan dukungan terhadap pemahaman materi perkuliahan. Namun demikian, penggunaan perangkat elektronik secara intensif juga menimbulkan berbagai tantangan, seperti kelelahan mata, kelelahan fisik, penurunan konsentrasi, ketergantungan terhadap teknologi, serta perubahan pola interaksi sosial. Temuan penelitian menunjukkan bahwa perangkat elektronik telah menjadi bagian penting dalam kehidupan akademik dan aktivitas sehari-hari mahasiswa. Oleh karena itu, penggunaan teknologi secara seimbang dan bertanggung jawab diperlukan untuk memaksimalkan manfaat pendidikan sekaligus meminimalkan dampak negatif yang mungkin muncul.

Keywords: academic performance, daily activities, electronic device use

Introduction

The rapid advancement of digital technology has fundamentally transformed the educational landscape, influencing how students access information, communicate, and engage in learning activities (Timotheou, S., et.al 2023). Electronic devices such as smartphones, laptops, and tablets have become indispensable tools in contemporary education, providing students with immediate access to learning resources and facilitating academic communication beyond the boundaries of conventional classrooms (Gikas, J., & Grant, M. M. 2013; Anshari, M., et.al, 2017). Recent discussions on digital transformation in education emphasize that technology has become an integral component of teaching and learning processes, particularly in higher



education institutions that seek to prepare students for increasingly digitalized societies and workplaces (UNESCO, 2023; Fuadiy et al., 2025). Consequently, the integration of electronic devices into educational settings continues to expand, creating new opportunities for enhancing learning experiences and academic engagement.

The growing adoption of digital technologies has generated substantial benefits for students, particularly in terms of access to information, learning flexibility, and academic productivity. Technology-driven learning environments enable students to access educational materials, participate in online discussions, and engage with diverse learning resources regardless of temporal and geographical constraints. Previous studies have shown that technology-enhanced learning can support the development of academic competencies and improve learning outcomes when digital tools are utilized effectively and purposefully (Akhtar, 2025; Pérez, 2025; Setiyawan et al., 2023). These findings are consistent with the Technology Acceptance Model proposed by Davis (1989), which suggests that individuals are more likely to adopt technological innovations when they perceive them as useful and easy to use in accomplishing specific tasks.

Despite these advantages, concerns regarding the excessive use of electronic devices have become increasingly prominent in educational research. While digital technologies can support learning activities, uncontrolled or non-academic use may negatively influence students' academic performance and learning behaviors. Research has indicated that intensive smartphone use may contribute to reduced concentration, increased distractions, and difficulties in maintaining focus during academic activities (Yildirim, 2025). In many cases, students frequently switch between educational tasks and social media platforms, resulting in fragmented attention and decreased learning efficiency. These conditions suggest that the educational benefits of electronic devices depend not only on their availability but also on how they are utilized within students' daily routines.

Beyond academic implications, the widespread use of electronic devices has raised concerns regarding students' physical and psychological well-being. Extended screen exposure has been associated with various health-related issues, including sleep disturbances, eye strain, fatigue, and mental health challenges. Li et al. (2021) reported that excessive screen time may contribute to adverse psychological outcomes among young people, highlighting the importance of balanced technology use. Furthermore, the increasing dependence on digital devices may create behavioral challenges, including technology addiction, excessive reliance on online interactions, and difficulties in regulating digital consumption. These issues indicate that the influence of electronic devices extends beyond academic contexts and affects multiple dimensions of students' everyday lives.

Although numerous studies have investigated the relationship between digital technology use and educational outcomes, much of the existing literature relies predominantly on quantitative approaches that focus on measuring statistical relationships between technology use and academic achievement. While such studies provide valuable insights into general patterns and trends, they often offer limited understanding of how students interpret, experience, and negotiate the benefits and challenges associated with electronic device use in their daily lives. Consequently, there remains a need for research that captures students' perspectives and lived experiences regarding the role of electronic devices in shaping both academic and non-academic aspects of their lives.

Another limitation within the existing body of literature is the relatively limited attention given to students enrolled in vocational higher education programs, particularly within the

Indonesian context. Vocational education possesses distinctive characteristics that combine theoretical knowledge with practical and technical competencies, potentially creating unique patterns of technology use among students. Therefore, exploring how vocational students experience and perceive the influence of electronic devices may provide insights that differ from those reported in more general higher education settings. Such understanding is important for developing educational strategies that maximize the benefits of technology while minimizing its potential risks.

Based on these considerations, this study aims to explore the influence of electronic device use on the academic performance and daily activities of students in the Electrical Engineering Study Program at Politeknik Negeri Sriwijaya. By employing a qualitative approach, the study seeks to provide a deeper understanding of students' experiences, perceptions, and reflections regarding the benefits and challenges of electronic device use. The findings are expected to contribute to the growing literature on educational technology and offer practical insights for promoting more balanced and effective use of digital technologies in vocational higher education.

Methods

This study adopted a qualitative descriptive approach to explore students' experiences, perceptions, and perspectives regarding the use of electronic devices in both academic and everyday contexts. A qualitative design was considered appropriate because it enables researchers to develop a comprehensive understanding of social phenomena through participants' interpretations and lived experiences within their natural settings (Creswell & Creswell, 2018; Suhirman et al., 2026). Rather than focusing on numerical measurements or statistical relationships, qualitative research seeks to uncover meanings, viewpoints, and contextual realities that shape individuals' behaviors and experiences (Suhirman et al., 2026). In the present study, this approach facilitated an in-depth examination of how electronic devices are integrated into students' learning activities and daily routines, as well as how such use influences their academic performance, personal well-being, and social interactions.

The research was conducted at Politeknik Negeri Sriwijaya, Palembang, South Sumatra, Indonesia. The participants consisted of six undergraduate students enrolled in the Electrical Engineering Study Program and aged between 18 and 22 years. Participants were selected through purposive sampling because this technique allows researchers to identify individuals who possess experiences and characteristics relevant to the research objectives (Suhirman et al., 2026). The inclusion criteria required participants to be actively enrolled in the study program and to regularly use electronic devices such as smartphones, laptops, and other digital technologies in their daily activities. Data were collected through semi-structured interviews and small-group discussions. These methods were selected because they provide flexibility for participants to express their experiences while enabling researchers to explore emerging issues in greater depth and obtain rich contextual information (Merriam & Tisdell, 2016; Suhirman et al., 2026). The interview protocol focused on patterns of device use, purposes of use, perceived academic benefits, and the influence of electronic devices on learning habits, physical health, psychological well-being, and social relationships.

The collected data were analyzed using thematic analysis following the framework proposed by Braun and Clarke (2006). This analytical procedure involved several stages, including data familiarization, initial coding, theme generation, theme review, theme refinement, and interpretation of findings. According to Suhirman et al. (2026), qualitative data

analysis is an iterative process that requires continuous interaction between researchers and data to identify patterns, meanings, and relationships that emerge from participants' narratives. Therefore, the interview transcripts were read repeatedly to ensure a comprehensive understanding of the dataset before meaningful units of information were systematically coded and organized into thematic categories. To enhance the credibility of the findings, iterative reviews of the coding process were conducted, and information obtained from interviews and group discussions was compared to ensure consistency of interpretation. Through this procedure, several major themes were identified, illustrating both the educational benefits of electronic device use and the challenges associated with physical health, psychological well-being, and social engagement among students in a digitally connected environment.

Result and Discussion

Academic Contributions of Electronic Device Use

The analysis revealed that electronic devices played a significant role in supporting students' academic activities. All participants reported that smartphones and laptops had become essential tools in their daily learning processes. These devices were frequently used to access learning resources, search for academic references, download course materials, and complete assignments. For most participants, the ability to obtain information quickly and conveniently was perceived as one of the primary advantages of electronic device use. The availability of diverse digital learning resources enabled students to explore a broader range of information than was typically available through conventional learning materials provided in the classroom.

In addition to facilitating access to educational resources, electronic devices were found to play an important role in academic communication. Participants indicated that instant messaging applications, email, and online learning platforms enabled them to communicate more efficiently with lecturers and fellow students. Academic interactions that previously depended on face-to-face meetings could now be conducted more flexibly and in a timely manner. Several participants explained that they frequently used electronic devices to seek clarification regarding course content, obtain information about assignments, and coordinate collaborative academic tasks. These findings suggest that electronic devices function not only as information sources but also as important tools that support communication and collaboration within academic environments.

The findings further demonstrated that electronic devices contributed to students' understanding of course materials. When encountering concepts or topics that were difficult to comprehend during classroom instruction, participants reported using various digital resources, including educational videos, online articles, and learning platforms, to gain additional explanations. One participant stated, "*Digital devices such as smartphones and laptops have a huge impact on me because they make it easier to find learning materials and contact lecturers.*" Similar experiences were reported by other participants, who explained that electronic devices allowed them to independently search for supplementary information whenever classroom explanations were perceived as insufficient. According to the participants, the availability of digital resources supported more flexible and self-directed learning practices.

Although the extent of device utilization varied among participants, all of them acknowledged the positive contribution of electronic devices to their academic experiences. Some students reported using digital devices extensively throughout the day for educational purposes, whereas others tended to use them only when necessary. Despite these differences,

participants consistently emphasized that electronic devices had become indispensable components of their learning activities. Beyond expanding access to knowledge, these technologies assisted students in managing academic responsibilities more effectively and adapting to the increasing demands of higher education. Overall, the findings indicate that electronic devices have become integral elements of students' academic lives, particularly within the context of the Electrical Engineering Study Program at Politeknik Negeri Sriwijaya.

Physical Effects of Electronic Device Use on Daily Life

In addition to supporting academic activities, electronic device use was found to generate several physical effects experienced by the participants. The interview data revealed that most students encountered various forms of physical discomfort that they associated with prolonged use of smartphones, laptops, and other digital devices. Academic tasks, information seeking, online learning activities, and non-academic uses of technology required students to spend substantial amounts of time interacting with screens each day. As a result, physical complaints emerged as a common aspect of participants' daily experiences.

One of the most frequently reported physical effects was eye-related discomfort. Several participants explained that extended use of smartphones and laptops often resulted in eye strain, soreness, and visual fatigue. These symptoms were commonly experienced after spending long hours completing assignments, accessing online learning materials, or engaging in other screen-based activities. One participant stated, *"I think I'm addicted to the internet because I have a lot of assignments that involve my phone, and sometimes I also experience cramps or eye pain from constantly looking at my phone."* This statement illustrates how intensive engagement with electronic devices may contribute to physical discomfort that becomes noticeable in students' everyday routines.

Beyond eye-related issues, participants also reported experiencing pain and tension in different parts of the body, particularly the neck, shoulders, and back. These complaints were generally associated with prolonged periods of device use while maintaining the same posture. Several students indicated that they often spent hours working on assignments using laptops or smartphones without taking adequate breaks. Consequently, physical discomfort became an increasingly common experience that occasionally interfered with other daily activities. These findings suggest that intensive use of electronic devices affects not only students' academic practices but also their physical well-being.

Participants further described feelings of physical fatigue following extended periods of device use. This fatigue was characterized by reduced energy levels, tired eyes, and a general sense of physical exhaustion after prolonged interaction with digital technologies. Although students acknowledged the substantial academic benefits provided by electronic devices, many also recognized the physical challenges associated with their continuous use. Overall, the findings indicate that physical health concerns constitute an important dimension of students' experiences with electronic devices and form a significant part of their daily interactions with digital technology.

Psychological and Behavioral Effects on Students

The analysis revealed that the use of electronic devices influenced not only students' academic and physical experiences but also various psychological and behavioral aspects of their daily lives. Most participants reported that extensive engagement with digital technologies affected the ways they managed their time, maintained attention, and regulated their patterns of technology use. Although electronic devices provided considerable convenience for

academic activities, participants also recognized several challenges associated with prolonged and frequent interaction with digital technologies. These experiences suggest that the influence of electronic devices extends beyond functional use and becomes embedded within students' everyday behaviors and routines.

One of the most prominent findings was the emergence of technology dependence among several participants. Students acknowledged that they often found it difficult to disengage from their smartphones, even when they were not involved in academic tasks. Digital devices had become constant companions in various activities, including learning, communication, entertainment, and leisure. One participant explained, *"I am very dependent on digital devices for various things such as doing assignments and searching for information, but the more I use them, sometimes I forget the time and rarely leave the house."* This statement illustrates how electronic devices had become deeply integrated into participants' daily lives, making it increasingly difficult for some students to regulate the amount of time spent using them.

Participants also described experiences related to reduced concentration and occasional forgetfulness. Several students indicated that continuously shifting attention between academic tasks, social media platforms, and other digital applications often disrupted their ability to remain focused on a single activity. One participant reported becoming more forgetful as a result of frequent engagement with digital devices throughout the day. These experiences suggest that constant exposure to multiple streams of information and digital interactions may influence students' attentional processes and their ability to sustain concentration during academic and non-academic activities.

Another notable finding concerned students' concerns about missing information or online interactions occurring within their digital environments. Some participants reported checking their smartphones repeatedly, even when there were no immediate academic requirements. This behavior appeared to be driven by a desire to remain informed about updates from social media, academic group chats, and various communication platforms. As a result, several students felt compelled to stay connected to their devices for extended periods throughout the day. Overall, the findings indicate that electronic device use shapes not only students' daily routines but also psychological and behavioral dimensions related to attention, technology use habits, and continuous engagement with digital environments.

Social Implications and Technology Dependence

The findings revealed that electronic device use influenced not only students' academic activities, physical well-being, and psychological experiences but also their patterns of social interaction. Most participants acknowledged that digital devices had become their primary means of communicating with friends, lecturers, and family members. The accessibility provided by various communication platforms enabled students to remain connected regardless of geographical and temporal constraints. However, alongside these advantages, participants described several changes in the ways they interacted with others and maintained social relationships in their daily lives.

Several participants reported that the increasing use of electronic devices had reduced the frequency of face-to-face interactions. Communication that was previously conducted through direct personal encounters was often replaced by instant messaging applications, social media platforms, and other forms of digital communication. While technology offered greater convenience and efficiency, participants recognized that it also decreased opportunities for in-person interaction. One participant explained that most of their daily communication activities

were now conducted through digital platforms because they were considered more practical and accessible than meeting people directly.

Another notable finding was the tendency of students to spend more time indoors engaging with electronic devices rather than participating in social activities outside digital environments. Some participants reported allocating a significant portion of their leisure time to browsing social media, consuming online content, or exploring various internet-based activities. Over time, these habits appeared to reduce their involvement in face-to-face social experiences. One participant stated, *"The more I use digital devices, sometimes I forget the time, rarely leave the house, and always depend on digital devices."* This statement illustrates how intensive engagement with electronic devices may influence students' social routines and participation in offline activities.

In addition to changes in social interaction patterns, the findings suggest that electronic devices have become deeply embedded in students' daily routines. Nearly all participants described digital devices as essential tools that were difficult to separate from their everyday activities. This dependence was reflected in the tendency to constantly carry, check, and rely on electronic devices in various situations. Although participants acknowledged the benefits of technology for academic and communication purposes, they also recognized that excessive reliance on digital devices could diminish the balance between online engagement and direct social interaction. Overall, the findings indicate that electronic devices have significantly shaped how students communicate, interact with others, and engage in social activities within their daily lives.

Discussion

The findings of this study demonstrate that electronic devices have become integral components of students' academic and daily lives. Participants consistently reported that smartphones, laptops, and other digital technologies contributed positively to learning activities by facilitating access to educational resources, supporting academic communication, and enhancing understanding of course materials. At the same time, students also described a range of challenges associated with prolonged device use, including physical discomfort, psychological concerns, changes in behavioral patterns, and reduced face-to-face social interaction. These findings suggest that electronic devices function as both educational enablers and potential sources of personal and social challenges, depending on how they are utilized in everyday contexts.

The first major finding concerns the academic contributions of electronic device use. Participants emphasized that digital technologies enabled them to access information more efficiently, communicate with lecturers and peers, and independently explore learning materials beyond classroom instruction. This finding aligns with previous studies highlighting the role of technology in improving access to educational resources and supporting student engagement in learning activities (UNESCO, 2023; Setiyawan et al., 2023). The widespread availability of digital learning materials appears to provide students with greater flexibility in managing their learning processes and obtaining information relevant to their academic needs.

Furthermore, participants reported that electronic devices supported their understanding of course content by allowing them to seek supplementary explanations through online resources. This finding is consistent with the Technology Acceptance Model proposed by Davis (1989), which suggests that individuals are more likely to adopt technological tools when they perceive them as useful in achieving desired outcomes. In this context, students perceived

electronic devices as valuable learning tools that enhanced their ability to access knowledge and overcome learning difficulties. The findings therefore reinforce the view that technology can serve as an effective educational resource when integrated purposefully into students' learning practices.

The second major finding relates to the physical effects associated with prolonged electronic device use. Participants frequently reported experiencing eye strain, neck pain, back discomfort, and physical fatigue following extended periods of interaction with digital devices. These experiences indicate that intensive engagement with screen-based technologies may create physical challenges that accompany the academic benefits of technology use. Similar concerns have been documented in previous research, which has linked prolonged screen exposure to various forms of physical discomfort and reduced well-being (Li et al., 2021).

The physical challenges identified in this study may be attributed to extended screen time and prolonged periods of maintaining similar body postures while using electronic devices. As students increasingly rely on digital technologies for academic tasks, opportunities for physical movement may become limited, potentially contributing to discomfort and fatigue. These findings highlight the importance of balancing academic technology use with healthy behavioral practices to minimize potential physical consequences associated with prolonged device engagement. Another important finding concerns the psychological and behavioral effects of electronic device use. Participants described difficulties in regulating their technology use, including tendencies toward dependence, reduced concentration, occasional forgetfulness, and frequent monitoring of digital platforms. These experiences suggest that electronic devices may influence not only students' learning activities but also broader aspects of cognitive and behavioral functioning. Similar patterns have been reported in studies examining the relationship between intensive technology use and students' attention management, self-regulation, and technology dependence (Yildirim, 2025).

The findings also indicate that students experienced a strong desire to remain continuously connected to digital environments. Frequent checking of smartphones and online platforms appeared to be motivated by concerns about missing information, social interactions, or academic updates. Such behaviors illustrate how digital connectivity has become deeply embedded in students' daily routines. While continuous access to information offers practical advantages, excessive engagement may create challenges related to attention control and effective time management. The final theme concerns the social implications of electronic device use. Participants reported that digital technologies facilitated communication and enabled them to maintain connections with others more conveniently. These findings support previous arguments that technology can strengthen communication networks and increase opportunities for interaction across different contexts (UNESCO, 2023). The ability to communicate instantly through digital platforms represents one of the most valued benefits of contemporary electronic devices.

However, participants also noted that increased reliance on digital communication often reduced opportunities for face-to-face interaction. Some students described spending more time engaging with digital content and less time participating in offline social activities. This tendency may contribute to social isolation and greater dependence on technology as a primary means of interaction. Consequently, while electronic devices can enhance connectivity, excessive reliance on them may alter traditional patterns of social engagement and reduce direct interpersonal communication. Overall, the findings of this study highlight the dual nature of electronic device use among university students. On the one hand, digital technologies

provide substantial academic advantages by facilitating access to information, communication, and independent learning. On the other hand, excessive or uncontrolled use may contribute to physical discomfort, psychological challenges, and changes in social behavior. These findings underscore the importance of promoting balanced and responsible technology use among students. Educational institutions may play an important role in fostering digital literacy and encouraging healthy technology practices that maximize educational benefits while minimizing potential risks.

Conclusion

This study explored the influence of electronic device use on the academic performance and daily activities of Electrical Engineering students at Politeknik Negeri Sriwijaya. The findings revealed that electronic devices play an important role in supporting academic activities by facilitating access to learning resources, improving communication, and enhancing students' understanding of course materials. These technologies have become essential components of students' learning experiences and contribute to greater flexibility in accessing information and completing academic tasks.

At the same time, the study identified several challenges associated with prolonged and intensive device use, including physical discomfort, technology dependence, reduced concentration, and changes in social interaction patterns. The findings suggest that while electronic devices offer substantial educational benefits, their impact is shaped by how they are used in everyday life. Therefore, promoting balanced and responsible technology use is essential for maximizing academic advantages while minimizing potential physical, psychological, and social consequences. Future studies involving larger and more diverse participant groups are recommended to provide a broader understanding of students' experiences with digital technology in higher education.

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