The Influence of Gadget Use on Academic Stress Levels in High School Adolescents

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Abstract. This research aims to examine the influence of gadget use on the academic stress levels of high school students in Jakarta. With the widespread use of smartphones and other digital devices among teenagers, concerns have arisen regarding their impact on mental health and academic performance. This study employed a quantitative method using a Likert-scale questionnaire distributed to 100 students aged 16–19 years. The variables measured included duration and frequency of gadget use, and indicators of academic stress such as emotional symptoms, behavioral patterns, and cognitive responses. Descriptive analysis and simple linear regression were used to interpret the data. The findings reveal that although students frequently use gadgets—primarily for social media and academic purposes—there is no statistically significant relationship between gadget use and academic stress levels ($t = -0.329$, $p = 0.743$). The regression coefficient was negative but negligible, indicating that increased gadget use slightly reduces stress, though the effect is minimal and not meaningful. The coefficient of determination ($R^2 = 0.001$) confirms that only 0.1% of academic stress variation is explained by gadget use. These results suggest that other factors, such as academic workload, personal expectations, and social environment, play a more dominant role in influencing stress among high school students. The study concludes that while gadgets are heavily used, they do not significantly contribute to academic stress, highlighting the importance of a holistic approach to adolescent mental well-being.

Keywords: Gadget use, academic stress, high school students, mental health, digital behavior, adolescent psychology.

Introduction

In today's era of rapid technological advancement, gadgets have become an inseparable part of everyday life. These devices, which include smartphones, tablets, and laptops, serve not only as tools of communication but also as mediums for entertainment, education, and social interaction. For adolescents, gadgets represent more than just technological devices; they symbolize a lifestyle and are often perceived as necessities rather than luxuries. With the increasing digitalization of society, adolescents are being exposed to gadgets at an earlier age and for more extended periods. Indonesia is among the countries experiencing an exponential increase in internet usage. According to data from the Indonesian Internet Service Providers Association (APJII), by 2022, the internet penetration rate among adolescents aged 13–18 had reached 99.16%. This overwhelming statistic highlights how adolescents are the most active users of digital technologies, accessing various platforms for entertainment, social interaction, and academic purposes. While the widespread use of gadgets has offered undeniable conveniences—such as facilitating online learning, providing quick access to information, and enabling communication—it has also led to growing concerns regarding its psychological and academic impacts(Fitriana et al., 2021).

Adolescence is a critical developmental phase characterized by significant physical, emotional, and

social changes. It is a time when individuals begin to form their identity, develop autonomy, and engage in complex decision-making. As such, adolescents are particularly vulnerable to external influences, including those arising from excessive gadget use. While gadgets can support learning and socialization when used appropriately, overuse and misuse can disrupt important developmental processes. Adolescents are increasingly relying on gadgets to cope with academic pressures, boredom, and emotional distress—often using entertainment applications and social media to distract themselves from real-life challenges.

One of the most prominent issues linked to gadget overuse among adolescents is academic stress. Academic stress refers to the psychological distress experienced by students as a result of academic demands and expectations. This stress may manifest in various forms, such as anxiety, depression, sleep disturbances, and reduced academic performance. It arises when students perceive a discrepancy between the academic demands placed upon them and their ability to meet those demands. Stress can be both internal, stemming from personal beliefs, mindset, and perfectionism, and external, influenced by parental expectations, peer competition, and institutional pressure. The use of gadgets has introduced new stressors that were previously absent in more traditional learning environments. Notifications from messaging apps and social media platforms can be disruptive and reduce attention span, contributing to procrastination and poor time management. Moreover, adolescents may compare themselves to idealized portrayals of success and intelligence on social media, which can lead to feelings of inadequacy and increased academic pressure. Many students report that while gadgets are helpful for accessing educational resources, they also become sources of distraction that interfere with studying and completing assignments(Putri et al., 2022).

The dual role of gadgets—as both tools of empowerment and potential stressors—necessitates a deeper understanding of their impact on adolescent mental health, particularly in the context of academic performance. Although some previous studies have examined the relationship between gadget use and academic performance, few have explored its specific connection to academic stress. This study aims to bridge this gap by investigating how the frequency and duration of gadget usage influence the academic stress levels of high school students. Another dimension of concern is the physiological and psychological toll of excessive gadget use. Adolescents who use gadgets excessively often experience symptoms such as headaches, eye strain, fatigue, and disrupted sleep patterns. Psychologically, they may exhibit signs of irritability, depression, anxiety, and social withdrawal. Research has shown that adolescents addicted to digital devices tend to lack coping mechanisms for stress, opting instead for temporary relief through entertainment or social media. This dependence on gadgets for emotional regulation can undermine resilience and reduce the ability to manage academic challenges constructively.

Moreover, many adolescents lack the time management and self-regulation skills necessary to control their gadget use. They may spend several hours daily scrolling through social media, watching videos, or playing online games—often at the expense of their academic responsibilities. This imbalance leads to reduced study time, increased procrastination, and ultimately, heightened academic stress. As school demands increase, particularly in upper secondary levels, the inability to manage gadget use can result in cumulative stress, missed deadlines, and declining academic confidence. Given these concerns, this research focuses on examining the correlation between gadget use and academic stress in high school students. It investigates whether factors such as duration of use, types of applications accessed (e.g., social media, games, educational content), and perceived usefulness of gadgets contribute to or mitigate academic stress. The study also considers how students perceive the impact of gadgets on their mental health and academic motivation(Fatimah & Rizki, 2020).

The novelty of this study lies in its specific focus on the mental health consequences of gadget use within the academic setting. While much of the existing literature focuses on general psychological outcomes or academic performance, this research highlights academic stress as a distinct and measurable construct. By using standardized psychological instruments to measure stress levels and correlating them with patterns of gadget use, the study aims to provide empirical evidence that can inform educators, parents, and policymakers. The findings of this study are expected to contribute significantly to the field of educational psychology and adolescent mental health. They will offer insights into how digital behaviors intersect with academic demands and how students can be guided to adopt healthier, more balanced approaches to technology. Furthermore, the study hopes to generate practical recommendations for reducing academic stress

through digital literacy education, time management training, and supportive school policies.

In conclusion, the digital era has transformed how adolescents interact with the world, including their approach to education. While gadgets offer numerous advantages, their unchecked use can lead to significant psychological and academic consequences. Understanding the complex relationship between gadget usage and academic stress is crucial for promoting student well-being and academic success. This study seeks to address this issue comprehensively by exploring the patterns, perceptions, and effects of gadget use on the academic stress levels of Indonesian high school students(Safira, 2021)

Methods

This study uses a quantitative research approach aimed at analyzing the relationship between gadget usage and the academic stress levels of high school students. The unit of analysis is individual students in senior high school (SMA), specifically those in grades XI and XII who are able to comprehend and respond to the questionnaires provided. The research population includes all grade XI and XII students in selected high schools in Jakarta. Since the total population is large and not precisely known, the sampling method used is probability sampling, with the sample size determined using the formula for unknown populations. Based on this calculation and using a 10% margin of error, a total sample of 100 respondents was selected. These respondents were considered to represent the broader student population due to their accessibility and comprehension level. Prior to data analysis, the research instrument underwent validity testing to ensure that each item accurately measured the intended construct. All questionnaire items were found to be valid, with correlation coefficients exceeding the threshold value ($r > 0.196$). Descriptive Statistical Analysis was used to summarize respondent characteristics and average responses to each item. Hypothesis Testing involved both the t-test (partial test) and the F-test (simultaneous test). A significance level of $p < 0.05$ was used to determine whether the relationships observed were statistically significant(Ali et al., 2022)

Result and Discussion

This study investigates the impact of gadget usage on academic stress levels among high school students in Jakarta. Data were collected from 100 students using a structured questionnaire based on Likert scales. The variables measured include the frequency and duration of gadget usage and its influence on emotional, behavioral, and physiological symptoms of academic stress. The demographic profile shows that 60% of the respondents were female and 40% were male. Most of the respondents were aged 18 (67%), followed by 16-year-olds (14%), 19-year-olds (11%), and 17-year-olds (8%). This distribution indicates that the sample represents the late adolescence stage, where academic expectations and exposure to digital media are at their peak.

Descriptive analysis of gadget usage revealed that a majority of respondents agreed with statements indicating high engagement with digital devices. For instance, 37% strongly agreed and 29% agreed that they need to manage their gadget usage better, with an average response score of 4.03, falling under the "very good" category. This indicates a high level of awareness among students regarding the necessity of time management in gadget usage. In terms of academic utility, 38% of respondents strongly agreed and 46% agreed that gadgets help them complete school tasks. This item recorded a mean score of 4.22, categorized as “good.” However, this is juxtaposed with the perception that gadgets are also distracting: 34% strongly agreed and 37% agreed that gadgets divert them from studying and increase their stress levels. The average score of 4.05 supports this concern(Pangestika et al., 2018).

Interestingly, 33% of respondents strongly agreed and 31% agreed that they use gadgets for more than four hours daily, with an average response score of 3.97. This aligns with other studies indicating that prolonged exposure to screens can negatively affect cognitive focus and time allocation. In relation to academic-related anxiety, 54% strongly agreed and 26% agreed that excessive gadget use negatively affects their mental health. The mean score of 4.34 places this item in the “very good” category, suggesting a high level of self-awareness among students regarding the psychological implications of their gadget habits. Socially, gadget use was seen positively. About 44% of students strongly agreed and 36% agreed that gadgets help them feel more connected with friends, with a mean score of 4.24. While this enhances social connectedness, it may also serve as a double-edged sword when it comes to academic distraction, especially

through social media notifications(Kurniawati & Andini, 2019).

Concerning academic stress indicators, 52% of respondents strongly agreed and 40% agreed that their academic achievements do not match the effort they exert, resulting in a high average score of 4.44. This reflects students' dissatisfaction and contributes to psychological pressure, a core symptom of academic stress. Moreover, cognitive challenges were highlighted: 34% strongly agreed and 47% agreed that they struggle to understand study materials, while 50% strongly agreed and 36% agreed that they often feel they lack sufficient time to complete school assignments. These statements recorded average scores of 4.15 and 4.36, respectively. These high values indicate significant levels of academic strain among respondents.

In terms of physical symptoms, 40% strongly agreed and 48% agreed that they often feel tired even without engaging in strenuous physical activity. The mean score of 4.28 emphasizes that academic pressure may manifest in physical fatigue, commonly seen in stress responses. To validate the instrument, a reliability and validity test was conducted. All items achieved a correlation coefficient (r count) greater than the r table value of 0.196, and Cronbach's Alpha values were above 0.6—specifically, 0.860 for gadget use and 0.616 for academic stress. These figures confirm that the measurement instruments are valid and reliable. A simple linear regression analysis was applied to examine the relationship between gadget use and academic stress. The resulting regression equation is:

Y = 22.154 - 0.015X

The negative coefficient indicates that each unit increase in gadget use correlates with a 0.015 unit decrease in academic stress level. However, the correlation is weak and statistically insignificant, as confirmed by the t-test result: the t-count is -0.329, which is lower than the t-table value of 1.985. The significance value was 0.743, well above the conventional 0.05 threshold. The Pearson correlation coefficient (R) was found to be 0.033 with an R^2 value of 0.001. This implies that gadget usage explains only 0.1% of the variance in academic stress levels, and 99.9% of the variation is influenced by other factors not explored in this study. Additionally, the F-test produced an F-value of 0.108, which is lower than the critical F-table value. The significance level of 0.743 further confirms the absence of a statistically meaningful relationship between the variables.

Overall, the results show that while students report high levels of gadget use and academic stress independently, the two are not statistically correlated in this dataset. This indicates that other psychological, social, or academic factors may play a more significant role in determining stress levels. Such factors could include teaching methods, family pressure, sleep habits, time management skills, or personal resilience. The findings call into question the common assumption that increased screen time is a direct cause of academic stress. Instead, it may be that certain patterns or purposes of gadget use rather than total screen time are more predictive of stress. For example, passive consumption of content might differ in impact from active educational engagement. In conclusion, the study illustrates that the mere quantity of gadget use does not significantly predict academic stress among high school students. However, subjective experiences of distraction, mental fatigue, and information overload are present and acknowledged by students. This underlines the importance of promoting mindful, intentional, and balanced gadget use among adolescents to protect their mental health and support their academic success(Sari & Nugroho, 2023).

This study aimed to examine the relationship between gadget use and the level of academic stress experienced by senior high school students in Jakarta. The findings, supported by statistical analysis, revealed a surprising outcome: gadget use was not significantly correlated with academic stress levels. This section discusses the implications of these results, analyzes the potential causes, and connects them with previous literature and theoretical frameworks. The descriptive results revealed that most students reported high frequency and long durations of gadget use, especially for academic purposes, accessing social media, and communicating with peers. Despite this high usage, regression analysis indicated that gadget use had a negligible negative effect on academic stress levels, with a beta coefficient of -0.015. This means that each additional unit of gadget use was associated with a minimal decrease in academic stress, but this relationship was not statistically significant. The R^2 value of 0.001 further confirmed that only 0.1% of the variance in academic stress could be explained by gadget use. Thus, the null hypothesis (no significant relationship) was supported. At first glance, this may appear counterintuitive, considering the growing concern among educators and psychologists about digital addiction and its psychological consequences. However, several factors might explain why gadget usage did not emerge as a strong predictor of stress in this context. First,

many students use gadgets not just for entertainment but also for academic activities such as doing research, communicating with teachers and classmates, and managing assignments. For instance, a significant portion of the respondents agreed that gadgets helped them complete schoolwork more efficiently and access educational resources. This suggests that gadgets may play a dual role both as a potential distractor and as a tool for academic support(Marskole & Astuti, 2021).

Moreover, the data demonstrated that students themselves are aware of the need to regulate their gadget use. Many respondents expressed agreement with statements indicating a conscious effort to manage their gadget time and maintain focus on their studies. This self-awareness and intentional usage may buffer the potentially harmful psychological effects that are often linked to overuse or misuse of technology. Another explanation for the lack of significant correlation lies in the nature of academic stress itself. According to the literature reviewed in the study, academic stress is influenced by multiple internal and external factors, including family expectations, peer competition, exam pressure, poor time management, emotional resilience, and personal beliefs about performance. It is possible that these factors exert a stronger influence on students' stress levels than gadget use does. In other words, while gadgets may be involved in daily student life, they may not be the root cause of academic stress, which tends to stem from deeper systemic and emotional challenges.

The findings align with the theoretical framework used in the study. The Cognitive Load Theory posits that stress arises when individuals are overwhelmed with cognitive demands that exceed their processing capacity. While gadgets can add to cognitive loa especially when used for multitasking or when notifications create continuous interruptions they can also reduce cognitive strain by enabling faster access to information and simplifying learning processes. Therefore, the net effect on stress may vary depending on how gadgets are used, not simply how often. Similarly, Social Comparison Theory, often cited in discussions of digital stress, explains how individuals compare themselves with others on social media, leading to feelings of inadequacy or pressure. In this study, however, such comparisons did not appear to significantly affect students' stress levels. One possible interpretation is that students in this population have developed resilience or coping strategies to deal with social media pressures, or that they do not perceive online comparisons as relevant to their academic responsibilities.

Notably, the qualitative responses also highlighted that while some students acknowledged stress associated with gadgets, many considered them essential to their learning environment. For example, students reported using gadgets to join online learning platforms, search for educational videos, participate in group discussions, and even practice time management using productivity apps. These positive uses can mitigate the negative implications often discussed in popular discourse on technology and youth. It is also important to recognize the methodological scope of this research. The study focused on students in urban Jakarta, many of whom likely have access to stable internet connections, educational support, and technology-literate environments. Their gadget use may be more structured and goal-oriented compared to students in rural areas or those with less supervision. Therefore, the results may not be generalizable to all demographics.

Furthermore, the tools used to measure stress and gadget use while statistically valid and reliable are still limited by self-reporting biases. Students may underreport the extent of their stress or overstate the academic utility of their gadget use to conform to perceived social desirability. Future studies may benefit from incorporating observational data, digital usage logs, and interviews to triangulate findings more accurately. This study contributes to the growing body of literature that seeks to understand how technological advances intersect with youth mental health and academic performance. It challenges the often simplistic assumption that more screen time equals more stress and underscores the importance of context, intention, and individual differences. While gadget overuse can undoubtedly lead to negative outcomes in certain circumstances, it is not an inherently harmful factor, especially when used mindfully and for constructive purposes(Khanafiah, 2023).

The results suggest that rather than focusing solely on limiting gadget use, educators and parents should emphasize digital literacy and self-regulation. Programs aimed at helping students develop healthy technology habits, time management skills, and stress coping mechanisms may be more effective than strict screen-time policies. Additionally, schools should explore integrating technology into the curriculum in a way that promotes engagement, reduces academic burden, and leverages digital tools to enhance rather than

hinder learning. In conclusion, this study has provided evidence that contradicts the commonly held belief that gadget usage directly contributes to academic stress among high school students. While the presence of gadgets is ubiquitous, their influence on stress levels appears to be minimal and potentially mitigated by responsible use. The findings encourage a more nuanced view of youth technology engagement—one that recognizes both its potential risks and its substantial benefits. Future research is encouraged to delve deeper into how specific types of gadget use such as late-night usage, multitasking, or emotionally charged social media interactions may impact mental health in more targeted ways. Ultimately, understanding the complexity of digital life is essential in creating supportive environments for the academic and emotional development of adolescents(Ardiansyah & Sulastri, 2017)

Conclusion

The results of this study indicate that gadget usage does not have a significant influence on the academic stress levels of high school students in Jakarta. This is supported by the determination coefficient value (R^2) of 0.001, which means that only 0.1% of the variance in academic stress levels can be explained by gadget usage, while the remaining 99.9% is influenced by other factors not examined in this study. The partial hypothesis test (t-test) revealed a t-value of -0.329, which is smaller than the t-table value of 1.985. This confirms that the effect of gadget use on academic stress is statistically insignificant. Additionally, the regression analysis resulted in the linear equation Y = 22.154 - 0.015X, where the coefficient of gadget use (X) is negative. This implies that an increase in gadget use slightly decreases academic stress levels, by a factor of 0.015, assuming other variables remain constant. However, this impact is minimal and statistically insignificant.

In practical terms, although students reported frequent gadget usage and acknowledged its role in both aiding and distracting them from academic tasks, the data suggest that gadget use alone is not a decisive factor in determining academic stress. Other potential factors such as time management, academic workload, personal resilience, family support, and individual coping mechanisms may play a more prominent role and should be explored in future studies. Theoretically, this study contributes to the understanding of the interaction between technology use and adolescent mental well-being, especially within educational contexts. While gadget use is often assumed to be a major source of distraction and stress among students, this research reveals that its role is more complex and less deterministic than commonly believed. Therefore, stakeholders in education teachers, parents, and policymakers should consider a broader set of variables when addressing academic stress in teenagers. Strategies should be focused not only on limiting gadget use but also on enhancing emotional support, promoting healthy study habits, and teaching students to manage digital distractions more effectively

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