Investigating the Impact of Excessive Phone and ChatGPT Use on Students' Personality Development and Academic Performance

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Abstract

The increasing use of smartphones and artificial intelligence (AI) tools, such as ChatGPT, has transformed learning and engagement opportunities for students. However, excessive use of these technologies raises concerns regarding their effects on students' emotional regulation, social skills, and academic performance. This study explores the impact of excessive smartphone and ChatGPT use on the personality development and academic performance of high school students. A mixed-methods approach was employed, utilizing the Digital Well-Being and Technology Use Scale (DWTUS) and the Technology Impact Interview Protocol (TIIP) to assess students' technological use, emotional well-being, and academic outcomes. The results indicate a significant negative relationship between overuse of technology and academic performance, as well as social and emotional regulation. The study emphasizes the need for balanced technology use in educational settings and provides recommendations for educators and parents to guide students toward healthier digital engagement.

***Keywords**: Smartphones, AI tools, ChatGPT, Emotional regulation, Critical thinking, Academic performance*

Introduction

The integration of smartphones and artificial intelligence (AI)-powered tools like ChatGPT has significantly enhanced educational opportunities by providing students with greater access to learning resources and personalized support (Wang & Li, 2020). These tools facilitate individualized learning, enabling students to work at their own pace and acquire knowledge outside the traditional classroom setting. However, as technology becomes increasingly integrated into educational practices, concerns have emerged regarding its potential negative impacts on students' emotional regulation, social skills, and cognitive development.

Excessive smartphone use and reliance on AI tools such as ChatGPT may contribute to passive learning, reduced face-to-face communication, and emotional instability (Brown & Patel, 2023). Research suggests that prolonged exposure to smartphones and AI tools can diminish

critical thinking abilities and hinder independent problem-solving skills, which are vital for academic success (Kaur & Singh, 2022). Additionally, frequent technology use is associated with social isolation and emotional distress, potentially impairing students' social and emotional well-being (Montag et al., 2016).

This study aims to explore how excessive use of smartphones and ChatGPT impacts students' academic performance and personality development. Specifically, it examines the effects of these technologies on students' social skills, emotional regulation, and critical thinking abilities. Moreover, the study offers recommendations for promoting balanced technology use in educational settings, with a focus on the roles of educators and parents in guiding students' digital engagement.

Research Questions

1. How does the excessive use of smartphones and ChatGPT influence students' personality development, particularly their social skills and emotional regulation?

2. What is the impact of overuse on students' academic performance and critical thinking abilities?

3. What strategies can be implemented to balance technology use and promote healthy learning behaviour?

Researcher Objectives

1. To examine the correlation between excessive use of smartphones and ChatGPT and students' academic performance, emotional regulation, and social skills.

2.To assess the negative impact of technology overuse on critical thinking and independent problem-solving abilities.

3.To identify strategies for balancing technology use and fostering healthy digital habits.

Research Design and Methodology

Variable of the Study

Independent Variable: Excessive use of smartphones and ChatGPT (measured by hours of use per day).

Dependent Variables: Academic performance, emotional regulation, and social skills.

Sample: A total of 200 high school students, aged 14–18, participated in this study. Participants were selected using purposive sampling to ensure that they were regular users of smartphones and AI tools, including ChatGPT, for both academic and recreational purposes.

Research Tools:

Digital Well-Being and Technology Use Scale (DWTUS)

The Digital Well-Being and Technology Use Scale (DWTUS), developed by Montag et al. (2016), is used to assess students' technology usage patterns, emotional regulation, social interaction, and academic performance. The scale consists of 25 items, divided into three sections: Technology Usage Patterns (10 items), Emotional Regulation (8 items), and Academic Impact (7 items). Sample questions from the DWTUS include, "How many hours per day do you use AI tools like ChatGPT for academic tasks?" and "Do you experience difficulty concentrating on academic tasks without the use of your smartphone?" The tool has a high reliability, with a Cronbach's alpha of 0.88, and is validated across various adolescent populations, ensuring its effectiveness in measuring technology's impact on students.

Technology Impact Interview Protocol (TIIP)

The Technology Impact Interview Protocol (TIIP), created by Livingstone and Helsper (2007), is a semi-structured interview guide designed to explore the qualitative impacts of smartphone and AI tool use on students' emotional regulation, social skills, and academic performance. The TIIP provides a platform for obtaining detailed insights into students' personal experiences with technology and its effects on their social and academic lives. Sample questions from the TIIP include, "How has your smartphone usage affected your ability to engage in face-to-face conversations?" and "Can you describe a situation where ChatGPT either helped or hindered your academic progress?" The TIIP is effective in gathering rich, qualitative data that offers a deeper understanding of the emotional and social consequences of excessive technology use.

Data Collection Procedures

Quantitative Data: The study employed the Digital Well-Being and Technology Use Scale (DWTUS) to collect quantitative data. This standardized questionnaire assessed participants' technology usage patterns and their effects on academic performance and emotional regulation, providing measurable insights into the impact of technology use.

Qualitative Data: For qualitative data, semi-structured interviews were conducted with a subset of 50 students. These interviews offered in-depth perspectives on students' experiences with technology, emphasizing its influence on their academic achievements and social interactions. This combination of quantitative and qualitative methods facilitated a comprehensive examination of the effects of technology use on students' academic and personal development.

Analysis and Interpretation

Quantitative Findings: A strong negative correlation ($r = -0.72$, $p < 0.01$) was found between excessive smartphone and AI tool use and students' academic performance. A moderate negative correlation was observed between technology use and emotional regulation ($r = -0.54$, $p < 0.01$), and social skills ($r = -0.60$, $p < 0.01$).

Qualitative Findings: Thematic analysis of interview data revealed three key themes Over-reliance on Technology: Students felt that excessive use of AI tools like ChatGPT hindered their critical thinking and problem-solving abilities.

Social Isolation: Students reported decreased face-to-face interactions, contributing to feelings of loneliness and poor communication skills

Emotional Distress: Increased screen time was linked to heightened stress and anxiety, particularly when facing academic challenges that could not be addressed by technology.

Table 1

Correlation between Smartphone and AI Tool Use and Academic Performance, Emotional Regulation, and Social Skills

Variable	Academic Performance	Emotional Regulation	Social Skills
Smartphone Use	-0.72	-0.65	-0.59
AI Tool Use	-0.68	-0.62	-0.55

Table 2

Regression Analysis Predicting Academic Performance and Emotional Regulation from Technology Use

Predictor Variable	Academic Performance	Emotional Regulation	R^2
Smartphone Use	-0.58	-0.49	0.20
AI Tool Use	-0.54	-0.46	0.18

Results

Technology Use and Academic Performance

The analysis revealed a significant negative correlation between the amount of time spent on smartphones and AI tools and students' academic performance ($r = -0.72$, $p < 0.01$). Regression analysis showed that increased use of these technologies accounted for a 20% variance in students' performance on critical thinking tasks, indicating that excessive use of these tools contributes to lower academic achievement, particularly in tasks requiring deep cognitive engagement.

Impact on Social Skills and Emotional Regulation

Quantitative Findings: Students who reported higher levels of smartphone and AI tool use scored lower on measures of emotional regulation (mean score: 3.5/5), suggesting that excessive use of these technologies is linked to increased anxiety and emotional instability.

Qualitative Findings: The qualitative findings from the interviews revealed that students who heavily relied on ChatGPT and smartphones for academic tasks experienced diminished interpersonal communication skills. Many expressed concerns about the decline in face-to-face interactions, which they attributed to increased screen time. The thematic analysis of the interview data identified three key themes. Over-reliance on technology emerged as a common issue, with students reporting that dependence on AI tools like ChatGPT reduced their confidence in solving problems independently. Social isolation was another recurring theme, as increased screen time led to fewer social interactions, resulting in feelings of loneliness and disconnection. Additionally, emotional stress was frequently mentioned, with students describing heightened levels of anxiety, especially when faced with academic challenges that could not be resolved through AI tools. These findings highlight the multifaceted emotional and social impacts of excessive technology use among students.

Discussion

Implications for Educational Psychology

The findings suggest that while smartphones and AI tools like ChatGPT can offer educational benefits, their excessive use has negative implications for students' social skills, emotional regulation, and academic performance. While these tools can provide valuable resources and enhance learning in many contexts, over-reliance can lead to passive learning behaviors,

reduced interpersonal communication, and increased emotional instability. These results align with existing research on the negative impacts of technology overuse on adolescents (Montag et al., 2016).

Educational Implications

Educators must recognize the potential drawbacks of excessive technological use and integrate strategies that promote balanced engagement. Digital literacy programs can play a key role in helping students develop responsible technology use habits, fostering critical thinking, and encouraging independent learning. Furthermore, incorporating offline learning opportunities, such as group discussions and collaborative problem-solving tasks, can help mitigate the negative effects of excessive screen time.

Recommendations

Integrate Digital Literacy into Educational Curriculum**:** Schools should implement digital literacy programs that teach students to use technology responsibly, critically evaluate digital content, and balance screen time with offline activities.

Promote Offline Learning Actives: Schools should offer more opportunities for collaborative learning through group discussions, problem-solving workshops, and outdoor activities, which can help students develop essential social and cognitive skills.

Parental Guidance and Monitoring: Parents should be actively involved in managing their children’s technology use. Setting limits on screen time and encouraging healthy habits can prevent the negative effects of excessive technology use on students' social, emotional, and academic development.

Conclusion

This study highlights the dual-edged nature of technology use in education. While smartphones and AI tools like ChatGPT offer significant learning benefits, their excessive use can impair students’ emotional regulation, social skills, and academic performance. A balanced approach to technology use is essential for fostering students’ holistic development. Educators, parents, and policymakers must work together to promote responsible digital habits and ensure that technology supports, rather than hinders, students’ academic and personal growth.

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