The Impact of Screen Time on Students Learning in Higher Education

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Abstract

This research looks into the impact of screen time on academic performance among female students in higher education in Pakistan. Through a quantitative approach with 116 female participants, the research reveals a weak positive correlation between screen time and Cumulative Grade Point Average (CGPA). Data of screen time, and academic performance was collected using a structured questionnaire. The reliability (α) value was 0.83 for screen time demonstrating high internal consistency. Validity was assured by experts' review. The study highlights the need for interventions to promote healthier screen time habits and create conducive learning environments. The findings highlight that the use of incorporating digital literacy into the curriculum and have implications for educational institutions and policymakers and formulating policies to enhance digital well-being. As we go through the digital age, more study is necessary to investigate other elements impacting this relationship and improve the development of successful strategies for maximizing student learning experiences.
Keywords: higher education, impact, screen time, students' learning

Introduction

Devices like smartphones and computers are common now a days, and they've changed how people live every day. Young people especially, spend a lot of time on these devices. Because high school is crucial time for students for thinking and learning, people are worried about how much time students spend on screens and how it affects their school performance (Twenge & Campbell, 2018). As screens become an important part of school life, it's really important to understand how the way students study habits effects their learning. Screens are now used everywhere, spending too much time in front of them can lead to some serious issues on our health and our education. Some smart researchers have been looking into this, and their findings are quite interesting.

According to the study it is found that teenagers who are obese and are into habit of excessive screen time will lead to have lower academic achievement. Adolescents with low interest in physical activity or who have maximum time on screen recommendations are less likely to get good grades. Overall, poor health habits like laziness and too much screen time are linked to lower academic performance (García-Hermoso & Marina, 2017). In Addition to this, using

screens just right before bedtime showed links to obesity, dry eyes, and lower academic performance. The research tells that both the duration and timing of screen use play a role in these health and learning issues, focusing the importance of considering when and how long children use screens. (Mineshita et al., 2021).

Too much use of screen time, especially on smartphones, may cause harm to brain development results in difficulties like lower self-esteem, more mental and health issues, slow learning, and increase chance of early cognitive decline (Neophytou et al., 2021). The research suggests that spending too much time on smartphones and electronic media during teenage leads to negatively impact on academic performance. The study tells how important it is to keep balance between screen time and other activities for improved academic outcomes in young individuals. It was also found that increased screen time, especially more than three hours per day, is linked to lower academic performance (Patel et al., 2022). Amez et al. (2023) found that for every increase in smartphone use by the average amount, suggests a connection between more smartphone use and a decrease in academic performance.

Smartphone are frequently used by university students across the globe. The study found that how smartphone use affects university students, focusing on techno stress triggered by excessive use, life disturbances, and overflow of information. The research showed that habitual smartphone use indirectly influences sleep and academic issues through techno stress. Most of researchers discovered that too much screen time, especially beyond three hours each day, is connected to doing worse in school (Giedd & Rajapakse, 2019). This study investigates how screen time, like mobile or computer, affects female students in universities in Lahore, Pakistan. Many studies worldwide have been conducted on this topic, but there's a lack of research specifically considering Lahore's unique culture and education system. It's important to explore how it impact students' success in Lahore to understand what works best for them and their specific challenges in academics and personal development.

Hypothesis of the study
Following were the hypothesis for the study
H_{01}: There is no significant relationship between students' screen time and academic performance in higher education.
H_{02}: There is no significant effect of screen time on students' learning outcomes in higher education.

Background Literature
Screen Time
The term "screen time" describes how much time individuals spend using digital devices like computers, televisions, and smartphones. It has become a major concern because to its potential impact on physical and mental health, particularly among children and adolescents. The American Academy of Pediatrics (AAP) advises limits on screen time for various age groups to ensure a balanced lifestyle and reduce potential adverse effects on health (AAP, 2016).

Studies have shown that the relationship between screen time and mental health outcomes, revealing associations with increased risk of depression, anxiety, and

attention problems, particularly in adolescents (Twenge & Campbell, 2018). According to the research the excessive use of social media , a significant component of screen time, has also been a subject of interest and may associated with low psychological well-being, such as feeling of loneliness and inferiority complexes(Priimack et al., 2017). Some studies have looked into the effects of screen time on language development, executive functions, and academic achievement, presenting mixed findings that highlight the complexity of such relations (Nathanson et al., 2014; Madigan et al., 2019). The COVID-19 pandemic has increased worries about screen time concerns due to increased reliance on digital gadgets for remote learning, work, and socializing. A study by Loades et al. (2020) investigated the impact of the pandemic on the mental health of children and adolescents, emphasizing the need for a balanced approach to screen time management during these unusual times (Loades et al., 2020).

Student Learning
Students participate in a wide range of subjects and disciplines, fostering intellectual growth and skill development. For example, they often involve into critical thinking, research methodologies, and advanced subject matter within their chosen majors subjects. According to Jones and Smith (2018), these academic pursuits improve analytical skills and contribute to a well-rounded educational experience. STEM students investigate cutting-edge technologies and scientific advances (Brown & Miller, 2019), whereas humanities and social science students examine historical events and societal patterns (Johnson, 2020).

Moreover, higher education encourages collaborative learning, prepare students for real life challenges (Anderson et al., 2017). Courses often incorporate practical experiences, such as internships or research projects, providing hands-on application of theoretical knowledge (Clark & Davis, 2021). Additionally, students improve communication skills through presentations and written assignments (Taylor, 2018). In summary, students' overall learning experience is enhanced by higher education, which combines academic understanding with real-world applications in a variety of subjects (Smith, 2022). This varied approach equips students with the tools necessary for personal and professional success in an ever-evolving global landscape (Adams & White, 2019).

Screen time and Student learning
Recent studies have focused more on the impact of screen time on the academic performance and overall well-being of adolescents. This review covers key findings from multiple studies that investigate the associations between screen time, various health behaviors, and academic achievement among adolescents in different cultural contexts. Yan et al. (2017 Year) conducted a study in Wuhan, China, involving 2625 middle and high school students, demonstrating significant associations between screen time and unhealthy behaviors, academic performance, and well-being. Activities that includes watching television, playing electronic games, receiving electronic news, and using social networking sites were lead to create negative outcomes, including lower academic performance, less physical activity, sleep issues , and diminished overall well-being.

In a study involving 395 adolescents, García-Hermoso et al. (2017) investigated the relationship between weight status, physical activity, screen time, and academic achievement. Utilizing multiple tools, such as the International Obesity Task Force cut-off points, a Physical Activity Questionnaire, and inquiries regarding screen-time behaviors, the research discovered that teenagers who were obese and engaged in excessive screen time also performed worse academically. Obesity, inadequate physical activity, and excessive screen time were all associated with lower academic achievement, according to logistic regression analysis. Sinnarajah et al. (2019) studied 1200 primary school children in Sri Lanka, focusing on associations between screen time, academic performance, and behavior. While the majority of screen time was appropriate, a notable percentage exceeded 2 hours. The study shows the connections between screen time, academic performance, and behavioral changes, suggesting the necessity for national screen time guidelines.

Additionally, Patel et al. (2022) investigated the association between screen time and academic performance in 301 teenagers aged 10-18 years. Using a pilot-tested semi-structured questionnaire, the study found a statistically meaningful negative relationship between increased screen time (>3 hours per day) and decreased academic performance. Those not using screen media achieved higher average grades, emphasizing the potential detrimental impact of extended screen time on academic success. Overall, these studies focus the importance of understanding the multifaceted relation between screen time, academic performance, and overall health in adolescents. The findings highlight the need for detailed strategies to address screen time habits and promote healthy behaviors among this demographic group.

Theoretical framework
The theoretical framework is based on cognitive load theory, digital distraction theory, social cognitive theory, and self-regulated learning theory.

Cognitive Load Theory: Cognitive Load Theory (CLT) explains how the human brain processes and retains information. It suggests that learning is most effective when cognitive load, or the mental effort required to process information, is managed. If the cognitive load is too high, it can hinder learning (Sweller, 2020). Educators use CLT to design instructional materials that minimize unnecessary cognitive load, allowing students to focus on essential content.

Self-Regulated Learning: The process through which students actively direct their own educational experiences is known as self-regulated learning, or SRL. It entails establishing objectives, keeping track of results, and modifying tactics as necessary. Effective SRL enhances academic performance, as students become more autonomous in their learning (Zimmerman, 2018). Educators can promote SRL by teaching students metacognitive strategies.

Digital Distraction Theory: According to this theory, always being around digital devices can cause distractions that make it harder for us to focus on our academic work. Overusing screens can raise the likelihood of becoming sidetracked which can impact students' ability to focus and do well in school. Student miss uses electronic devices for non-academic purposes has been increases all over the world (Flanigan et al; Jamet et al., 2020; Ravizza et al.,

2017; Wammes et al., 2019) it is also known as digital distraction (Flanigan et al; McCoy, 2020)

Social Cognitive Theory: According to Social Cognitive Theory (SCT), people pick up new behaviors and abilities from seeing other people in their surroundings as well as from their own experiences. This theory places a strong emphasis on the value of social influence, observational learning, and self-efficacy in altering behavior. Bandura (2018) argues that cognitive processes such as attention, retention, and motivation are key to how individuals acquire and perform new behaviors.

Materials and Methods
Research Design
This study, which looked at the relationship between screen time and learning outcomes among female students in higher education institutions in Lahore, Pakistan, used a correlational research design and was quantitative in nature.

Study Participants
Non-Probability convenient sampling strategy was used to select 116 female students from various Universities in Lahore, Pakistan from graduate and undergraduate level. The use of convenient sampling aimed to ensure representation from different academic disciplines and levels within the institutions.

Instrumentation
The data collection instrument includes a structured questions written in English language and included 10 items to measure participants' academic performance using Cumulative Grade Point Average (CGPA) and their involvement in screen use. The questionnaire was adapted from a validated and reliable tool used to measure factors associated with screen time in Brazilian students, as developed by Filho et al. (2021). This adaptation ensures the relevance and cultural appropriateness of the instrument for the current study context. The response scale for questionnaire items was based on a Likert scale varying from 1 (Strongly Disagree) to 5 (Strongly Agree). Participants were invited to complete the questionnaire online via Google form. The reliability of the scale was measured by using Cronbach's alpha (α) value. The alpha (α) value was 0.83 for screen time demonstrating high internal consistency. Validity was assured by three experts' opinion.

Ethical Consideration
The study's ethical consideration was carefully taken into account. Several of the study's participating institutes received request letters requesting data on their subjects. The participants were briefed by the researcher about the nature and goals of the study prior to the commencement of data collection. Additionally, participants received assurances that the data they submitted would only be utilized for instructional reasons. The freedom of participants to drop their participation or to withhold information was honored.

Data Analysis and Results

Statistical software was used to analyze quantitative data. To summarize screen time and academic performance, descriptive statistics were computed, including means and standard deviations. Regression analysis and correlation were also used to ensure reliability and test the hypotheses and also to explore relationships between screen time and student learning.

The following results are interpreted in alignment with the hypothesis.

H_{01}: There is no significant relationship between students' screen time and academic performance in higher education.

The Pearson correlation coefficient between screen time (ST) and student Cumulative Grade Point Average (CGPA) was calculated to assess the relationship between these two variables. Table 1 below summarizes the descriptive statistics and the correlation analysis results.

Table 1: *Correlation between Screen Time (ST) and Student Cumulative Grade Point Average (CGPA)*

Variable	N	*M*	*ST*	Screen time	CGPA
Screen time	116	39.77	6.75	-	.034
CGPA	116	4.53	8.72	.034	-

** Correlation is significant at the 0.01 level

Table 1 reveals that screen time has a weak positive correlation with CGPA (r = 0.034, p < 0.01). The correlation was not statistically significant, supporting the null hypothesis that there is no significant relationship between students' screen time and academic performance in higher education. Therefore, H_{01} is accepted.

H_{02}: There is no significant effect of screen time on students' learning outcomes in higher education.

To test this hypothesis, a regression analysis and ANOVA were conducted. Table 2 below shows the regression coefficients for the variables, including CGPA and screen time.

Table 2: *Regression Coefficients for CGPA and Screen Time*

Variable	B	β	ST
Constant	2.77		4.87
CGPA and ST	.044	.034	.121

R^2 = 0.001, N = 116, p < 0.05

The R^2 value of 0.001 revealed that the predictor variable (screen time) explained only 0.1% of the variance in the outcome variable (CGPA). The findings indicate that CGPA and screen time predicted a non-significant and weakly positive relationship (β = 0.034, p < 0.05). The screen time coefficient was 0.044, indicating that a student's CGPA was expected to rise by 0.044 units for every unit increase in screen time. The analysis of variance (ANOVA) results, as shown in Table 3, further supports the findings.

Table 3: *Analysis of Variance (ANOVA) for the Influence of Screen Time on Academic Achievement in Higher Education*

Model	Sum of Squares	df	MS	F	Sig.
Regression	10.261	1	10.26	.134	0.72
Residual	8726.92	114	76.55		
Total	8737.18	115			

According to the ANOVA results, the regression model did not significantly predict the impact of screen time on academic achievement (CGPA) in higher education, with F= 0.134 and p = 0.72 indicating that the model was not statistically significant. This result supports the earlier finding that screen time does not have a significant effect on students' learning outcomes. Therefore, H_{02} is accepted.

Discussion and Conclusions

The current study examines how screen time affects students' learning in the context of higher education. The statistical analyses conducted indicate a positive relationship between screen time and academic performance. However, this research also underscores a weak correlation between excessive screen time and academic success, emphasizing the urgency for interventions aimed at encouraging responsible screen time practices among students. Additionally, it stresses the importance of optimizing learning environments to address the detrimental effects of excessive screen time. This study found no significant relationship between screen time and academic performance. These results are not aligned with the previous study by Yan et al. (2017) and Patel et al. (2022), which highlighted the counterproductive nature of excessive screen time on learning outcomes, regardless of the age group. However, this study contrasts with the findings of Nathanson et al. (2014) and Madigan et al. (2019), who reported positive effects of screen time on certain aspects of cognitive development. The current research did not differentiate between types of screen time, leaving unanswered questions about whether specific types or more acute screen time are the key factors influencing academic performance. The study advocates for universities to adopt effective policies and strategies to mitigate the negative effects of screen time and improve learning conditions. While the study provides valuable insights, limitations such as sample size and the cross-sectional design suggest the need for further research using longitudinal designs to better understand the impact of screen time on academic success.

In conclusion, the analysis conducted for this study suggests that there is no significant relationship between students' screen time and academic performance in higher education. Similarly, screen time does not have a significant effect on students learning outcomes. The results support the acceptance of both hypotheses, suggesting that other factors may be more influential in determining students' academic success. It is appropriate to conduct additional research in the future to investigate other factors that could mediate or moderate the effect of screen time on student learning outcomes. This will help shape the creation of more comprehensive interventions and policies that maximize learning opportunities for students in the digital age.

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