

Impact of Technology Use on Attention Span and Concentration Among High School Students

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Abstract— This study examined the relationship between technology use, attention span, and concentration among high school students. Forty-one students in grades 9–12 completed an anonymous survey measuring daily recreational technology use, technology multitasking while studying, perceived digital distraction, and self-reported concentration. Students reported an average of 5.4 hours of recreational technology use per day. Higher daily technology use was moderately associated with lower concentration scores ($r = -0.42$), while multitasking with technology during schoolwork showed a stronger negative relationship with concentration ($r = -0.56$). These results are consistent with research suggesting that media multitasking can interfere with attention control and academic performance among adolescents. Students who used technology for more than six hours per day also reported lower average concentration than students who used it for fewer than three hours daily. The findings suggest that frequent interruptions and multitasking, rather than technology itself, may be particularly important predictors of concentration difficulties.

Keywords— Attention span, concentration, high school students, technology use.

I. INTRODUCTION

Technology is an important part of high school students' academic and social lives. Smartphones, laptops, tablets, online videos, games, and social media can help students communicate, locate information, complete schoolwork, and participate in creative activities. However, these same devices can create distractions when notifications, messages, videos, and multiple open applications compete for a student's attention.

Attention span refers to the ability to maintain focus on a task over time, while concentration is the ability to direct mental effort toward one activity while ignoring distractions. These skills are especially important in high school because students are expected to read complex materials, solve problems, take notes, study independently, and complete assignments under time limits. Research has linked frequent social-media multitasking during study with lower attention control and poorer academic performance among adolescents (Kokoc, 2021).

The effect of technology is not necessarily always negative. Educational videos, research tools, collaborative documents, and learning platforms may support academic engagement when used intentionally. Yet research reviews have found that media multitasking can interfere with working memory, reading comprehension, note-taking, recall, self-regulation, and efficiency (May, 2018). Therefore, the present study explored whether students with higher technology use and more frequent multitasking reported lower levels of concentration.

The study addressed three research questions:

- Is daily recreational technology use related to students' concentration?

- Is technology multitasking during homework related to concentration?
- Do students with different levels of technology use report different average concentration scores?

II. PURPOSE

Previous research suggests that extensive technology use and frequent multitasking may be related to lower concentration, but individual experiences can vary. Some students use devices productively for schoolwork, while others use them mainly for entertainment or social interaction. The current study surveyed 41 high school students to examine the relationships among daily recreational technology use, technology multitasking during study, digital distraction, and concentration.

It was hypothesized that students who reported more recreational technology use, more multitasking during schoolwork, and stronger feelings of digital distraction would report lower concentration scores.

III. METHOD

Research design

This study used a cross-sectional survey design. Students completed a short anonymous questionnaire about their technology habits and their ability to stay focused during schoolwork. The study examined relationships among variables at one point in time; therefore, it cannot establish cause and effect.

Participants

The sample included 41 high school students from grades 9–12. Of the participants, 22 identified as female (53.7%), 18 identified as male (43.9%), and 1 preferred not to state a gender identity (2.4%). The grade distribution included 9 ninth-grade students (22.0%), 12 tenth-grade students (29.3%), 11 eleventh-grade students (26.8%), and 9 twelfth-grade students (22.0%).

Participation was voluntary. The survey did not collect names, student identification numbers, or other personally identifying information.

Measures

Daily technology use: Students estimated the number of hours they spent using technology for non-school purposes on a typical day. This included smartphone use, social media, streaming, gaming, and recreational browsing. Responses were grouped as less than 3 hours, 3–5 hours, 6–8 hours, or more than 8 hours per day.

Technology multitasking: Students rated three statements on a 5-point scale from 1 (strongly disagree) to 5 (strongly agree). Example items included: “I check messages while doing homework,” “I switch between schoolwork and entertainment apps,” and “I usually have several tabs, apps, or devices open while studying.” Scores were averaged, with higher scores indicating more multitasking.

Digital distraction: Students rated statements such as “Notifications interrupt me when I am trying to study” and “I find it difficult to ignore my phone while doing schoolwork.” Higher average scores indicated stronger perceived distraction.

Concentration: Students rated four statements on a 5-point scale, including “I can focus on schoolwork for a long period of time,” “I can return to work quickly after an interruption,” “I lose focus easily when studying” (reverse-scored), and “I can complete homework without checking my phone.” Higher scores indicated stronger self-reported concentration.

Procedure

The survey was distributed through an online Google form and required approximately ten minutes to complete. Students first read a brief statement explaining that the survey was anonymous, voluntary, and intended only as a classroom research exercise. They then answered demographic questions and the technology-use, distraction, multitasking, and concentration items.

Data analysis

Descriptive statistics, including percentages, means, and standard deviations, were calculated for the main variables. Pearson correlations were used to examine relationships between daily technology use, multitasking, digital distraction, and concentration. Average concentration scores were also compared across four technology-use groups. Because the sample was small, the group results were interpreted as patterns rather than definitive conclusions.

IV. RESULTS

Technology-use patterns

Students reported an average of 5.4 hours of recreational technology use per day ($SD = 2.1$). Most students, 39.0%, reported using technology for 3–5 hours daily. Another 31.7% used it for 6–8 hours, while 14.6% used it for fewer than 3 hours and 14.6% used it for more than 8 hours.

Smartphones were the most frequently used device, followed by laptops and tablets. The most common non-school activities were social media, video streaming, gaming, messaging, and online browsing. Students reported a moderate-to-high level of technology multitasking while studying, with an average score of 3.58 out of 5 ($SD = 0.82$).

Concentration and distraction

The mean concentration score was 3.24 out of 5 ($SD = 0.71$), indicating moderate self-reported concentration. The average digital-distraction score was 3.67 ($SD = 0.77$), suggesting that many students felt notifications, messages, or the temptation to check devices interfered with their schoolwork.

Table 1 presents descriptive statistics and correlations among the main variables. Daily technology use was moderately negatively associated with concentration ($r = -0.42$). In other words, students who spent more time using technology for recreational purposes tended to report greater difficulty concentrating.

Technology multitasking had the strongest relationship with concentration ($r = -0.56$). Students who more often checked messages, switched apps, or used entertainment media while studying generally reported lower concentration. Digital distraction was also negatively associated with concentration ($r = -0.61$), indicating that students who felt more interrupted by their devices tended to report greater difficulty sustaining attention.

Table 1: Descriptive Statistics and Correlations Among Key Variables (N=41)

Variable	Mean	SD	1	2	3	4
1. Daily recreational technology use (hours)	5.40	2.10	—			
2. Technology multitasking	3.58	0.82	0.48	—		
3. Digital distraction	3.67	0.77	0.45	0.63	—	
4. Concentration	3.24	0.71	-0.42	-0.56	-0.61	—

Group differences

Students were divided into four groups based on daily recreational technology use. Students who used technology less than 3 hours per day reported the highest average concentration score ($M = 3.79$). Students using technology for 3–5 hours had an average concentration score of 3.42, while those using it for 6–8 hours averaged 3.03. Students reporting more than 8 hours of daily use had the lowest average concentration score ($M = 2.68$).

This pattern suggests a gradual decrease in reported concentration as recreational technology use increased. Nevertheless, the results should be interpreted carefully because only six students were in the highest-use group.

Table 2: Average Concentration by Daily Recreational Technology Use

Daily technology use	Students, n	Percentage	Mean concentration
Less than 3 hours	6	14.6%	3.79
3–5 hours	16	39.0%	3.42
6–8 hours	13	31.7%	3.03
More than 8 hours	6	14.6%	2.68

V. DISCUSSION

The survey results supported the prediction that greater recreational technology use would be associated with lower concentration among high school students. Students who reported more daily use tended to report lower concentration, and the group with more than eight hours of daily use had the lowest average concentration score (Siyami, 2023). This result is broadly consistent with research linking heavier mobile-phone or digital-device use with reduced attention and academic performance.

The strongest relationship in this study involved technology multitasking during schoolwork. Students who frequently switched between homework and messages, social media, videos, or other applications reported more difficulty focusing. This pattern is consistent with evidence that social-media multitasking is related to poorer attention control and that attention control is connected to academic performance. It is also consistent with broader reviews finding that media multitasking can interfere with working memory, reading comprehension, note-taking, recall, and self-regulation.

Digital distraction also showed a strong negative relationship with concentration. This may be because notifications and repeated phone checking interrupt sustained attention, making students restart their mental

focus after each interruption. Recent research has emphasized that frequent phone checking, rather than total use alone, may be an important behavior related to fragmented attention and weaker cognitive control (Tezler, 2026).

However, technology should not be treated as automatically harmful. Students use digital devices for school research, group communication, writing, educational videos, and creative projects. The results instead suggest that recreational overuse, constant notifications, and multitasking during academic tasks may be more problematic than technology use itself. A student who uses a laptop to write an essay without distractions may have a different experience from a student who repeatedly alternates between homework, short videos, games, and social media.

VI. LIMITATIONS

This study had several limitations. First, the sample was small (N=41) and came from one high school population, so the findings may not represent all students. Second, students estimated their own technology use and concentration, which may not be completely accurate. Objective measures, such as phone screen-time records or computerized attention tasks, could provide more precise data.

Third, the cross-sectional design cannot show causation. High technology use may contribute to concentration difficulties, but students with lower concentration may also be more likely to seek digital stimulation or switch between tasks. Finally, the survey did not distinguish fully between educational and recreational technology use, which may affect attention in different ways.

VII. CONCLUSION

In this survey of 41 high school students, heavier recreational technology use, more technology multitasking, and stronger digital distraction were all associated with lower self-reported concentration. The strongest relationship involved multitasking during schoolwork, suggesting that frequent switching between academic tasks and digital entertainment may be particularly disruptive. These findings align with previous research on media multitasking, attention control, and student performance.

Technology itself is not necessarily harmful; it can support communication, learning, and creativity. However, students may benefit from using technology more intentionally, reducing unnecessary interruptions, and creating focused periods for schoolwork.

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