**Teen Screen Time and Smartphone Addiction — A Data-Driven Insight**

**Tool Used:** Microsoft Excel  
**Skills Applied:** Data Cleaning | Data Transformation | Data Visualization | Trend Analysis

**Introduction**

This project explores how screen time and smartphone use affect teenagers' academic performance and overall wellbeing.  
In today’s world, phones have become a big part of our daily lives — especially for young people. While technology brings learning opportunities, it can also lead to distraction, addiction, and even stress.  
Through this dashboard, I wanted to understand **how much screen time is too much**, and how it connects to **academic performance, depression levels, and social habits** among teens.

**Story of Data**

The dataset provides information on teenagers’ screen habits, age, gender, addiction levels, depression levels, and academic performance.  
Each record represents a teenager, giving a complete picture of their phone use patterns — from how often they browse or play games to how their grades are affected.  
The goal was to tell a **data story** that shows the balance (or imbalance) between technology use and student productivity.

**Data Structure**

The dataset includes both **numerical** and **categorical** variables, such as:

* **Age** — grouped by teenage years (13–19).
* **Gender** — male, female, or other.
* **Screen Time** — total daily phone use (day and night).
* **Addiction Level** — how dependent a student is on their phone.
* **Depression Level** — self-reported emotional well-being score.
* **Academic Performance** — test scores or grades.

These variables were combined and analyzed to identify behavioral trends.

**Data Cleaning & Transformation**

Before analysis, I cleaned the dataset to make it more reliable:

* Removed blank or duplicate entries.
* Adjusted data types for easy calculation (e.g., converting text to numbers).
* Grouped similar variables (e.g., browsing, gaming, education).
* Created summarized tables to compare screen use by age, gender, and addiction levels.

This transformation step helped ensure that the charts were accurate and easy to interpret.

**Data Splitting**

**In this project, the data was divided into independent and dependent variables to better understand relationships and patterns.**

* **Independent Variables (Predictors):  
  These are the factors that may influence or explain a change in other variables.**
  + **Age**
  + **Gender**
  + **Screen Time (daily and nightly)**
  + **Social Media Usage**
  + **Addiction Level**
  + **Names**
  + **location**
  + **school grade**
* **Dependent Variables (Outcomes):  
  These represent the results or effects being measured.**
  + **Academic Performance**
  + **Depression Level**
  + **addicition level**
  + **Phone usage purpose**

**By splitting the data this way, I was able to analyze how screen time, age, and addiction levels affect academic outcomes and mental health among teens.  
This approach also made it easier to create focused visualizations that highlight cause-and-effect trends.**

**6. Industry Type, Stakeholders & Value**

* **Industry:** Education & Health Analytics
* **Stakeholders:** Teachers, Parents, School Counselors, Psychologists, and Policymakers.
* **Value to Industry:**
  + Offers data-backed evidence of the impact of digital behavior on learning.
  + Helps schools develop awareness programs.
  + Supports parents in creating healthy phone-use habits for their children.

**Pre-Analysis Overview**

Before diving into the charts, a few early patterns stood out:

- Younger users may spend more time on phones, while usage declines as age increases.

- Identifying the most active group helps target interventions for balanced usage.

- Academic performance might peak at certain ages and drop at others due to maturity, distractions, or workload.

- Performance may be linked to study habits or phone usage patterns tied to age.

- Social media use may be highest in teenage/early adult years, affecting focus.

- Older groups may prioritize work/education over social platforms.

- Educational use may rise with age as students face advanced studies.

- Patterns may reveal if younger learners rely less on phones for learning compared to older ones.

- Gaming may peak among teenagers, potentially competing with study time.

- Gaming might reduce with maturity as responsibilities increase.

- Excessive usage could distract from study time and lower grades.

- Heavy users may show stronger signs of mental health issues like stress or depression.

- Addiction might be concentrated in younger students, who are more impressionable.

- Social media and gaming may drive addictive behavior more than educational usage.

- Gender differences may exist—e.g., males gaming more, females using more social media.

These findings hinted at a possible link between heavy phone use and reduced focus or rest.

**Data Visualization and Charts**

The dashboard was designed in **Microsoft Excel** using different chart types to tell the story visually.

Here’s a breakdown of what each chart shows:

1. **Effect of Daily Phone Use on Academic Performance (Line Chart):**  
   Reveals how academic performance declines gradually as phone use increases.
2. **Top 10 Phone User Depression Levels (Bar Chart):**  
   Highlights how excessive phone users report higher depression levels.
3. **Gender Addiction Levels (Doughnut Chart):**  
   Shows that females slightly outscore males in addiction levels.
4. **Age and Social Media Screen Time (Bar Chart):**  
   Indicates that 16-year-olds spend the most time on social media.
5. **Night Screen and Phone Usage (Pie Chart):**  
   Breaks down what teens do most at night — browsing, gaming, or studying.
6. **Phone Usage by Age Groups (Horizontal Bar Chart):**  
   Confirms that screen time decreases slightly with age after 16.
7. **Impact of Age on Academic Performance (Horizontal Bar Chart):**  
   Shows how performance dips as phone usage increases beyond a certain threshold.

These visualizations make the relationships between technology use, emotional well-being, and performance easy to understand at a glance.

**In-Depth Findings**

**Daily phone usage across teens age groups**

**Observation**

* **Teens aged 16 have the highest daily phone usage, totaling 2363 hours across the dataset.**
* **In second place are 19-year-olds, with a total phone usage of 2165.2 hours.**
* **15-year-olds come third, recording 2149.5 hours of usage.**
* **13-year-olds fall in the middle range with 2129.3 hours.**
* **At the lower end, 14-year-olds are third from the bottom with 2094.1 hours.**
* **18-year-olds follow closely with 2087 hours.**
* **The lowest total phone usage among teenagers is recorded by 17-year-olds, with 2074 hours.**

**Pre-analysis**

* **Age 16 appears to be a critical year for smartphone engagement. This might coincide with increased social activity, academic stress, or greater autonomy from parents.**
* **The noticeable decline at ages 17 and 18 could reflect exam preparation periods, part-time jobs, or other responsibilities that reduce screen time.**
* **The lowest usage among 17-year-olds might signal greater self-regulation or tighter parental controls, especially if this age group is preparing for final-year exams.**
* **The spike at 19 could be linked to post-school freedom, university life, or relaxed restrictions, leading to more leisure-driven usage.**
* **Usage gradually increases from age 13 to 15, likely as teens gain more personal devices and begin forming online social habits.**

**Impact of Age on Academic Performance**

**Observation**

* Age 16 records the highest academic performance with a sum of 34,702, making them the top-performing age group.
* Age 13 follows with 32,426, slightly ahead of age 14 (32,071) and age 19 (31,997), showing a cluster of strong performances among early and late teens.
* Age 18 has the lowest performance with a sum of 30,780, followed closely by age 17 (30,986).
* Ages 17 and 18 consistently show the weakest performance outcomes compared to the rest.
* The overall trend suggests a peak around age 16 (mid-teens) with performance dipping as teens approach 17–18 years, then slightly recovering at 19.

**Pre-analysis**

* Peak at Age 16 may reflect a period of heightened academic engagement or maturity, possibly due to critical exams or increased study focus.
* Decline at Ages 17–18 could be linked to distractions such as preparing for transitions (college, social life, independence), higher stress, or reduced academic motivation.
* Slight recovery at Age 19 might indicate a regrouping or adaptation once teens enter higher education or more structured environments.
* Policy/Educational Insight: Schools and parents may need to provide additional academic and mental support for ages 17–18, as this appears to be the most vulnerable stage academically.

**Gaming screen time by teens age group**

**Observation**

* Age 16 spends the highest screen time on gaming with 720 hours, making them the top age group in gaming activity.
* Age 14 follows with 668.3 hours, slightly ahead of age 13 (660.3 hours) and age 15 (657.9 hours), forming a cluster of heavy gaming users.
* Age 19 records 656.5 hours, which is still relatively high and close to the early teens.
* Ages 17 (608.4) and 18 (604.4) show the lowest gaming screen time, with both groups below 610 hours.
* Overall, gaming screen time is highest in early to mid-teens (13–16), then drops during later teen years (17–18), before slightly rising again at 19.

**Pre-analysis**

* Peak Gaming at 16: This may be tied to leisure habits at that age when teens often have more free time and fewer transition-related responsibilities.
* Early Teens (13–15) Engagement: High gaming activity in this group may reflect curiosity, peer influence, and access to technology.
* Dip at 17–18: The reduction could be due to academic pressures, exam preparation, or shifting priorities (college applications, career focus).
* Rebound at 19: The slight increase may be linked to post-secondary school freedom and increased autonomy.
* Mental Health/Well-being Impact: Excessive screen time at peak ages (13–16) could impact sleep, physical activity, or study time, suggesting the need for balanced routines.

**Age Distribution of Social Media Screen Time**

**Observation**

* Age 16 records the highest social media screen time at 1193.2 hours, making them the most active users.
* Age 15 (1089.4), 13 (1068.5), and 14 (1065.1) form the next high-usage cluster, each above 1,060 hours.
* Age 19 (1040.1) and 17 (1035.5) have slightly lower usage, but still above 1,030 hours.
* Age 18 has the lowest social media screen time at 1005.9 hours, though the gap with other ages is not very large.
* Overall, screen time is consistently above 1,000 hours for all teen groups, showing widespread engagement with social media across ages.

**Pre-analysis**

* Peak at Age 16: Teens at this age may have the strongest social ties and online presence, driving high screen time.
* Stable Usage Across 13–15: Early teens (13–15) are also heavy users, indicating early adoption and peer-driven usage.
* Slight Decline at 17–18: Could reflect academic focus, exams, or shifting interests (e.g., preparing for college/university).
* Rise Again at 19: Suggests regained flexibility and autonomy after secondary school responsibilities.
* Comparison to Gaming: Unlike gaming (where there’s a sharper drop at 17–18), social media usage is more stable across ages, with less variation (about 180 hours difference between the highest and lowest). This highlights social media as a more consistent daily activity than gaming.

**Educational Screen Time Across Teen Ages**

**Observation**

* **Age 16** records the **highest educational screen time** at **471.3 hours**, showing peak engagement.
* **Age 13 (440.2)** follows closely, marking strong early-teen involvement.
* **Ages 17 (434.8)** and **18 (432.6)** maintain fairly similar levels, slightly lower than 13.
* **Age 15 (429.7)** and **14 (426.2)** are in the mid-range, clustered just under 430 hours.
* **Age 19** has the **lowest educational screen time** at **414.2 hours**, showing a decline at late-teen years.
* The overall range between the highest (471.3) and lowest (414.2) is relatively small (**~57 hours difference**), suggesting **more balanced engagement across ages** compared to gaming or social media.

**Pre-analysis**

* **Peak at 16:** Teens at 16 may experience heavier academic demands (e.g., exam preparation), driving higher screen time for study.
* **Steady Pattern:** Screen time for education remains **fairly consistent across ages**, unlike gaming and social media which fluctuate more strongly.
* **Early Adoption at 13:** A relatively high value at 13 shows that younger teens are already significantly engaged in educational screen use.
* **Decline at 19:** This could indicate reduced reliance on structured educational platforms after secondary school, possibly transitioning to different study methods or independence.
* **Comparison to Other Activities:** Educational screen time is **lower overall** than gaming and social media, showing that leisure dominates screen usage in teens.

**Daily Phone Usage and Depression Levels**

**Observation**

* Rank 1 (1639.9) shows the highest depression levels tied to daily phone usage.
* Rank 6 (1627.7) is very close, suggesting multiple usage levels correlate with high depression.
* Ranks 4, 9, 5, and 10 are also strongly associated with elevated depression (1490–1560 range).
* Lower ranks (2, 8, 3, 7) still show high depression but are slightly lower than top ranks (1388–1487).

**Pre-analysis**

* Higher phone usage = higher depression — the top ranks consistently align with higher depression levels.
* Non-linear trend: It’s not a smooth increase; some mid-ranks (like 6) show almost the same depression impact as the very top.
* Critical range (1600+) — daily usage at ranks 1 and 6 stands out as a threshold where depression effects may peak.
* Depression impact is universal — even the lowest point (rank 2 = 1388.7) still shows a strong correlation, meaning almost all levels of heavy daily phone use carry significant mental health risks.

**Gender Differences in Smartphone Addiction Levels**

**Observation**

* Females (9013.3) show the highest addiction levels, though only slightly higher than males.
* Males (9009.2) are almost at the same level, suggesting gender differences are minimal.
* Other genders (8623.2) report lower addiction levels, though still significantly high.

**Pre-analysis**

* Near parity between male and female teens: The difference between females and males is very small (~4 points), meaning addiction is not strongly gendered.
* Slight female lead: Females may spend more time on social media, browsing, and communication apps, which could explain the tiny edge.
* Males close behind: Male addiction may be more driven by gaming and browsing, keeping them almost equal to females.
* Other gender group: The slightly lower level (still >8600) might suggest less overall engagement, or differences in activity preference, but addiction remains consistently high across all groups.
* Big takeaway: Smartphone addiction is universal among teens regardless of gender — patterns differ, but intensity is the same.

**Addicition level by usage purpose**

**Observation**

* Browsing (5582.8) has the highest addiction level, showing teens are most hooked on general internet use (news, streaming, random searches).
* Other uses (5561.4) are very close, suggesting miscellaneous phone habits (chatting, entertainment, shopping, etc.) strongly drive addiction.
* Education (5328.3) surprisingly ranks third, which may reflect prolonged screen reliance for school, assignments, or e-learning.
* Gaming (5141.5) is slightly below education but still a major contributor to addictive use.
* Social Media (5031.7) has the lowest score, although still significant — indicating that while social media dominates in visibility, other uses actually trigger stronger addiction patterns.

**Pre-analysis**

* Browsing is the biggest hook: Teens get more “stuck” on browsing-related activities than even social media or gaming, possibly due to endless scrolling/streaming.
* Non-traditional addiction sources matter: “Other” uses ranking second shows that addiction isn’t only about gaming/social media — activities like chatting, shopping, or video streaming contribute heavily.
* Education as a double-edged sword: High addiction levels in education suggest that while it’s productive, extended reliance on devices for school can also fuel compulsive screen habits.
* Gaming vs. social media shift: Contrary to popular belief, gaming and social media are not the top addiction drivers — instead, browsing and education lead.
* Overall pattern: Teens’ phone addiction stems more from multi-purpose, always-available activities (browsing, mixed use) than single-focused ones (gaming/social).

**Nighttime Screen Time and Phone Usage Purposes**

**Observation**

* Browsing (638.7) takes the lead as the most common nighttime activity.
* Education (627.6) is a close second, showing that a significant number of teens also use nighttime hours for study purposes.
* Other uses (603.7) rank mid-level, suggesting miscellaneous activities (e.g., streaming, chatting, shopping).
* Gaming (585) comes in slightly lower, showing that while popular, it’s not the top priority during the night.
* Social Media (565.2) has the lowest nighttime usage, which is interesting because it often dominates daytime screen time.

**Pre-analysis**

* **Shift in priorities at night:** Unlike daytime, where **social media leads**, nighttime is dominated by **browsing and educational use**. This suggests teens might use late hours for research, assignments, or catching up on information.
* **Balanced education and entertainment:** The close competition between **education (627.6)** and **browsing (638.7)** indicates a dual-purpose use — both productive and leisure-driven.
* **Reduced social media activity:** The drop to the lowest position at night (565.2) suggests that **peer interactions may decline late at night**, perhaps due to school schedules or family restrictions.
* **Gaming still active:** Though not the top, **gaming remains significant (585)**, reinforcing its steady role in teen screen habits.

**Age Trends in Smartphone Addiction Levels**

**Observation**

* Age 16 has the highest smartphone addiction level at 4175.6, a clear peak across all ages.
* Age 15 (3826.7), 13 (3795.2), and 14 (3770.1) form the next cluster, showing early to mid-teen high dependency.
* Age 19 (3755.4) is still relatively high, but lower than mid-teens.
* Age 17 (3666.7) and 18 (3656) record the lowest addiction levels, showing a dip in late teens.
* The gap between the highest (4175.6 at 16) and the lowest (3656 at 18) is about 520.6, indicating significant variation.

**Pre-analysis**

* 16 as the critical age: Smartphone addiction peaks sharply at 16, likely due to increased social pressure, academic stress, and entertainment reliance.
* Early teens (13–15): Already show high addiction levels, indicating that problematic use starts quite early.
* Late teens (17–18): Addiction dips slightly, suggesting possible adaptation, maturity, or lifestyle changes (e.g., preparing for graduation, work, or exams).
* Age 19 rebound: Levels rise again slightly, possibly due to more freedom at university or early adulthood.
* General Trend: Smartphone addiction remains consistently high across all ages, with no group dropping below 3600.

**Effect of Daily Phone Use on Academic Performance**

**Observation**

* Highest academic impact (93 → 429.8): Students using phones at this daily level show the strongest negative effect on academic performance.
* Moderately high impact (98, 84, 59, 62 → 347–378): These ranks indicate a steady decline in performance, but not as severe as 93.
* Mid-range (75, 95, 57 → 331–340): Academic performance impact here is noticeable but less intense compared to the top.
* Lowest levels (82, 85, 61, 87 → 319–329): Still linked to reduced academic outcomes, but represent the least severe effect in the dataset.

**Pre-analysis**

* Strong negative correlation: The higher the daily phone use (especially around 90+ levels), the greater the decline in academic performance.
* Critical threshold (~90+): Once daily usage crosses into the 93+ range, performance dips sharply (biggest effect at 429.8).
* Steady slope of decline: From 84 down to 87, the drop is consistent, showing that even moderate levels of daily use accumulate academic strain.
* No “safe zone”: Even the lowest usage levels (in your dataset) still show performance reduction, meaning all daily overuse has measurable academic consequences.

**Post-analysis Insight**

**General Observation**

Age Trends:

Teens around 16 years old show the highest screen time and addiction levels, suggesting this is the most vulnerable age.

Both younger teens (13–14) and older ones (18–19) show slightly lower, but still high, levels.

Usage Purpose:

Browsing and “Other” activities top both nighttime use and addiction levels — meaning unstructured, non-educational use is the biggest driver of addiction.

Education-related use also ranks high, showing that even school-related screen time adds to overall exposure.

Gender Differences:

Females and males show almost equal addiction levels, meaning this is not strongly gender-specific — all groups are affected.

Mental Health:

Higher daily phone use correlates with higher depression scores — especially in heavy-use brackets.

Nighttime use amplifies this effect, as disrupted sleep worsens mental health.

Academic Performance:

Higher daily phone use strongly correlates with declining academic performance, especially at extreme usage levels (90+ units).

Even moderate use still has a measurable negative effect.

**GENERAL RECOMMENDATION AND INSIGHT**Set Healthy Limits: Encourage daily screen time caps, especially for teens around age 16, to reduce both addiction and negative academic/mental health outcomes.

Purposeful Use: Promote structured screen time (education, productive apps) while limiting unstructured browsing and excessive social media.

Nighttime Digital Hygiene: Limit phone use at night to protect sleep quality, which is closely tied to both academic success and mental health.

Parental/School Role: Schools and parents should educate on balanced phone use and possibly integrate digital wellness programs.

Mental Health Awareness: Since depression and addiction rise with high phone use, early mental health interventions should target heavy users.

Gender-Inclusive Programs: Since both males and females are equally affected, awareness and prevention programs should be broad and inclusive, not targeted to one gender.

Critical Usage Threshold: Watch for teens with extremely high daily usage (~90+), as this group shows the sharpest drop in academics and well-being — they should be priority intervention targets.

**Actionable Insights**

1. **Create Screen Time Guidelines for Teens:**  
   Since 16-year-olds show the highest addiction and screen time levels, schools and parents should collaborate to set realistic daily limits — ideally below the high-risk usage zone (90+ units). Encourage activities that replace excessive screen time, like sports, clubs, or reading.
2. **Promote Purposeful and Productive Use:**  
   Most phone use is for browsing or “other” unstructured purposes. Schools can integrate tech-driven learning tools that keep students engaged productively, while parents can monitor and guide toward educational or creative apps rather than random online use.
3. **Enforce Nighttime Digital Curfews:**  
   Late-night phone use disrupts sleep, fueling both depression and poor academic results. Introduce digital “cut-off” times — for instance, no phone use 30–60 minutes before bed. Campaigns or school clubs can help normalize this habit.
4. **Strengthen Mental Health Support:**  
   The link between screen addiction and depression highlights the need for counseling and peer-support programs. Schools could partner with mental health professionals to offer awareness sessions and stress-management workshops for heavy users.
5. **Boost Academic Performance through Awareness:**  
   Demonstrate to students the real data on how phone use affects grades. Use charts or interactive classroom sessions to show that reduced screen time can directly improve concentration and results.
6. **Involve Parents and Teachers in Joint Supervision:**  
   Encourage open communication between teachers and parents to identify early signs of addiction. Parent workshops or digital wellness training can help them better guide their children’s habits at home.
7. **Adopt Gender-Neutral Campaigns:**  
   Since both males and females show similar addiction patterns, all intervention strategies should target students equally. Focus messages on shared experiences and collective responsibility.
8. **Prioritize High-Risk Users:**  
   Teens with extremely high daily usage should be monitored more closely. Offering mentorship programs, wellness check-ins, or school-based interventions can prevent further decline in both academics and mental health.

**Broader Impact**

This analysis highlights a growing concern: **smartphone addiction among teens**.  
Beyond grades, excessive screen use can affect **mental health, confidence, and social behavior**.  
Understanding these data patterns helps educators and families take early steps to build healthier digital lifestyles.

**Conclusion**

This project gave me deeper insights into how teenagers interact with technology and how it shapes their learning and wellbeing.  
While technology is an amazing tool, it becomes harmful when overused.  
The key takeaway? **Balance is everything.**  
With proper awareness and data-driven decisions, we can guide young people to use their devices smartly — not excessively.