

# Week 4 Report

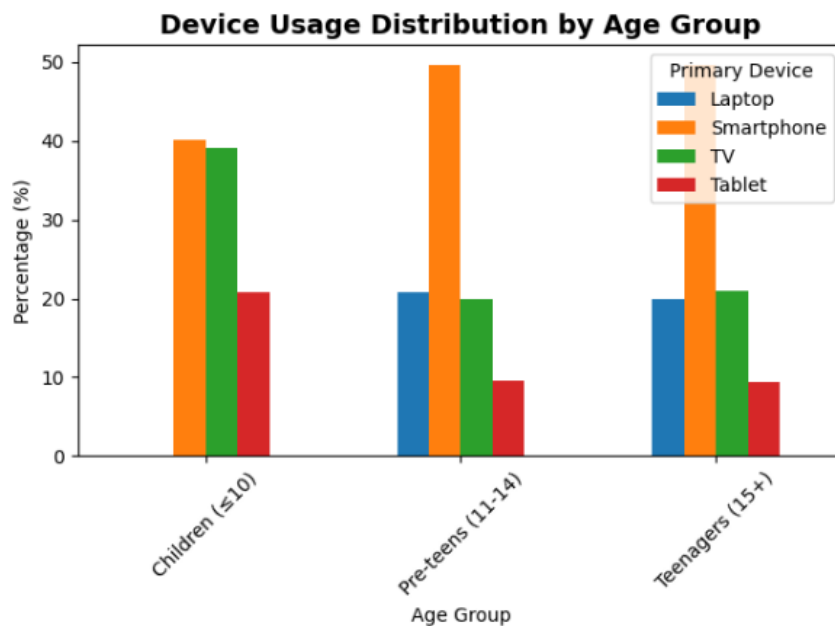
## Objective

The objective of this analysis is to examine how screen time varies across different devices and activity categories among various demographic groups. It aims to identify usage patterns and preferences based on age, gender, and location. Additionally, this week's analysis focuses on comparing screen time behavior between weekdays and weekends to understand how daily routines influence digital activity. The goal is to uncover meaningful insights into when, how, and on which devices users spend most of their screen time, providing a deeper understanding of lifestyle and usage trends.

## Plot 1: Device Usage Distribution by Age Group

This visualization illustrates how primary device preferences vary across different age groups. The results show that **younger users (pre-teens)** predominantly use **smartphones and tablets**, reflecting easy accessibility and entertainment-driven usage

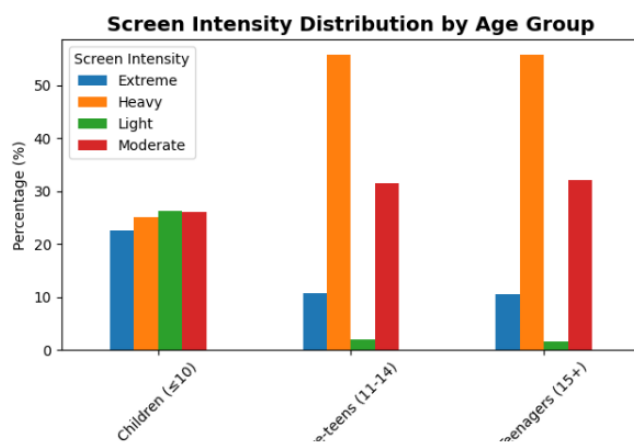
```
# Plot 1: Device Distribution by Age
plt.figure(figsize=(10, 6))
device_age = pd.crosstab(df['Age_Group'], df['Primary_Device'], normalize='index') * 100
device_age.plot(kind='bar')
plt.title('Device Usage Distribution by Age Group', fontsize=14, fontweight='bold')
plt.ylabel('Percentage (%)')
plt.xlabel('Age Group')
plt.xticks(rotation=45)
plt.legend(title='Primary Device')
plt.tight_layout()
plt.show()
```



## Plot 2: Screen Intensity Distribution by Age Group

This chart compares screen intensity levels—categorized as *Light*, *Moderate*, and *Heavy*—across age groups. The analysis reveals that **heavy screen usage** is notably more common among **teenagers**, likely due to increased social media activity, online learning, and entertainment. On the other hand, **younger users** display a relatively balanced distribution between moderate and light screen time. The findings highlight the importance of monitoring screen exposure among older students to mitigate health impacts such as eye strain and sleep disruption.

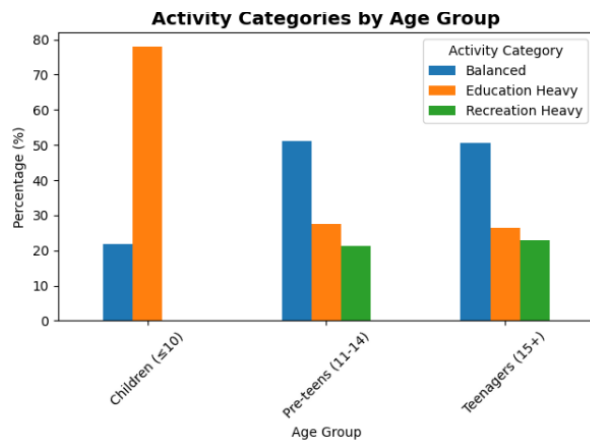
```
plt.figure(figsize=(10, 6))
intensity_age = pd.crosstab(df['Age_Group'], df['Screen_Intensity'], normalize='index') * 100
intensity_age.plot(kind='bar')
plt.title('Screen Intensity Distribution by Age Group', fontsize=14, fontweight='bold')
plt.ylabel('Percentage (%)')
plt.xlabel('Age Group')
plt.xticks(rotation=45)
plt.legend(title='Screen Intensity')
plt.tight_layout()
plt.show()
```



## Plot 3: Activity Categories by Age Group

This plot examines the distribution of activity types—*Recreation Heavy*, *Balanced*, and *Education Heavy*—across age groups. The results suggest that **pre-teens** are more inclined toward **recreational screen use**, whereas **teenagers** show a gradual shift toward **balanced or educational activity patterns**. This transition reflects the changing nature of digital engagement as academic responsibilities increase. However, the continued dominance of recreational activities among younger users underlines the need for early digital literacy and time-management awareness.

```
plt.figure(figsize=(10, 6))
activity_age = pd.crosstab(df['Age_Group'], df['Activity_Category'], normalize='index') * 100
activity_age.plot(kind='bar')
plt.title('Activity Categories by Age Group', fontsize=14, fontweight='bold')
plt.ylabel('Percentage (%)')
plt.xlabel('Age Group')
plt.xticks(rotation=45)
plt.legend(title='Activity Category')
plt.tight_layout()
plt.show()
```



#### Plot 4: Average Educational Ratio by Primary Device

The final bar chart compares the **average Educational-to-Recreational ratio** across different primary devices. The analysis reveals that **laptop users** have the highest educational usage ratio, suggesting that laptops are primarily used for learning and productivity tasks. In contrast, **smartphone and TV users** show lower educational ratios, emphasizing their stronger association with entertainment and leisure. This insight reinforces the idea that device type plays a significant role in shaping the purpose and quality of screen time.

```
plt.figure(figsize=(8, 6))
edu_ratio = df.groupby('Primary_Device')['Educational_to_Recreational_Ratio'].mean()
bars = plt.bar(edu_ratio.index, edu_ratio.values, color=['lightblue', 'orange', 'lightgreen', 'coral'])
plt.title('Average Educational Ratio by Primary Device', fontsize=14, fontweight='bold')
plt.ylabel('Educational to Recreational Ratio')
plt.xlabel('Primary Device')
plt.xticks(rotation=45)
```

