

Smart Devices Usage and Digital Transformation Among Generation Z: An Analytical Study on Trends, Behaviours, Challenges and Implications

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Abstract—Gen Z (Generation Z) means the group of people born roughly between 1997 and 2012. Since they grew up with smart phones, social media, and the internet they coined the Digital Generation. Young people spend more time looking at screens because their devices enable them to communicate with others while using social media and accessing entertainment content

, educational materials and playing games, searching for information. While learning new things and accessing information instantly, their excessive use of screen time causes problems that affect people across multiple areas of their existence[5]. which includes their relationships, academic performances, health issues, affects mental health concerns, distraction and reduced focus, social isolation[2]. Smart phones and tablets, interactive learning apps, exposure to global issues like sustainability and social justice, which are some positive outcomes for online courses and digital libraries[7]. The researchers used an analytical approach to link existing research results with current texting patterns that Generation Z uses on their smartphones [1]. Current research emphasizes smartphone dependency, detention span reduction, and social anxiety among Gen Z.

The proposed system suggests a balanced digital ecosystem: integrating digital literacy programs, promoting mindful device usage, and designing smart applications that encourage productivity and well being. The main objectives are:(1).To analyze the data that how gen z people are spending time on their smart devices and to identity the major activities, (such as social media,entertainment, gaming, education , and communication).(2).To examine the challenges and impact of smart phones usage among gen z people on their life style and behaviour, which includes sleep patterns, academic performance, and social interactions.(3).To identify the key influencing factors on smartphone dependency among gen z.

This Analytical study aims to track daily routines, screen

time, and multitasking habits to understand how devices influence productivity and lifestyle and also impacts on the psychological effects and this extensive usage reflects on their health and carrer[3]. The methodology used is collecting the primary data with 40 respondents and secondary data from 60 respondents with an age group of 18 to 20 years with an analytical research design to study usage patterns, exploring trends, attitudes, motivations, challenges in depth, record screen time, categories, and multitasking behaviors. For the purpose of data analysis and presentation of results, bar charts and pie charts are used to represent comparisons and percentage distributions of smartphone usage patterns. The data interpretation calculates the results and shows that smartphones impact both on positive and negative. The study concludes that these Gen Z people are spending more time on smart devices especially on gaming and social media. And this reflects on health and career. The scope of the study can be extended with all age groups.

Index Terms—Generation Z,screen time, communication, education, digital behavior, lifestyle impact, behavioral changes, physical health, mental well-being, academic performance, social interactions, smartphone dependency.

I. INTRODUCTION

Smart devices have become essential for daily life since Generation Z members use their smartphones to access their entire digital world. The modern digital world sees Generation Z using smart devices as essential devices throughout their everyday activities because they have known technological advancements and internet access since birth. Generation Z members use smartphones. To connect with others but also use them for multiple purposes which include social media

platforms and entertainment content and educational resources and gaming activities and online shopping and information retrieval. Young people now spend more time using their mobile devices because mobile technology lets them access their phones which causes changes in their daily activities and relationships with others and their overall behavior patterns. Generation Z uses smartphones for their social interactions and their learning processes and their recreational activities. The primary means through which people connect with each other now involve social media platforms and streaming services and digital applications. The use of smartphones provides users with immediate access to information and educational resources and worldwide content yet people who use their phones excessively without control will experience problems which include less physical exercise and sleep issues and lower in-person social contact and higher use of electronic devices. Users need to know both the duration of their smartphones because this information shows how their smartphone behavior affects their daily activities. The study of Generation Z smartphone usage will show researchers how much time they spend on their devices and which factors lead to their phone addiction. Main activities and daily phone usage patterns should be studied because they show how smartphones create both beneficial and harmful effects on users. The understanding of this information supports the development of effective promotional strategies.

II. REVIEW OF LITERATURE

1. It is a recent empirical study by nurhatisyah et al. (2026) examined about the relationship between digital transformation and gen z performance. findings revealed about the digital transformation has a significant positive effect on performance, with digital literacy acting as a key mediating factor. Approximately 45.7% of the impact of digital transformation on employee performance was transmitted through digital literacy. This study gives special importance that Gen Z are digital natives, advanced digital literacy skills are still essential to fully leverage smart technologies in organizational environments from the title “Digital Transformation and Gen Z Performance”.

2. Rashid (2025) explored how artificial intelligence is reshaping the digital transformation and about its implications for Generation Z. The study mainly highlights that AI-driven systems are creating new business models, leadership styles, and digital work environments, where Gen Z plays a central role due to the conditions by modifying behaviors, strategies, or mindsets. The research also points out that ethical AI usage and digital responsibility, this concerns especially for younger generations engaging deeply with smart technologies with title “AI-Driven Digital Transformation and Gen Z”.

3. Rosenberg (2025) conceptualized Generation Z as “mobile natives,” emphasizing their deep integration with smartphones and smart devices. The study has a special importance deep integration with smart devices and smart devices. This make a structure, idea that smart device usage is not just a tool but a core component of Gen Z’s lifestyle and digital behavior with title “Mobile Natives and Smart Device Usage”.

4. A 2025 study on digital transformation in education highlights that educational systems must adapt to provide digital competencies and personalized learning environments for students, particularly Gen Z (Aquino et al., 2025). this research highlights the necessity for educational systems and demands of a digital economy. Similarly, another 2025 study found that Gen Z students understand or view digital transformation in education as both an opportunity (flexibility, accessibility) and a challenge (distraction, digital overload) with title “Digital Transformation in Education and Gen Z Learning”.

5. Shonubi (2025) analyzed the challenges faced by organizations during digital transformation and found that integrating new technologies often leads to innovation barriers, structural changes, and adaptation difficulties. These challenges indirectly impact on Generation Z, who are the primary users and workforce participants in digitally transforming environments and integrating with new technologies. with title “Organizational and Innovation Challenges in Digital Transformation”.

6. Rani (2025) reported that Generation Z expects workplaces to provide: Digital learning platforms Remote work options Advanced technological

infrastructure. These expectations indicate that Gen Z favours work environment that are digitally transformed and prefers digitally transformed, flexible, and technology-enabled work environments with the title “Expectations in Digital Work Environments”

7.Recent technological reviews (Hu et al., 2025) show that smart devices such as wearable and wearable technologies are evolving into multifunctional systems for health monitoring, communication, and interaction. These are moving forward by ranging from bio - integrated sensors to AI-powered wearables, are shaping a growing, interconnected ecosystem. with the title “Emerging Smart Device Ecosystems (Wearables & IoT)”.

III. OBJECTIVES OF THE STUDY:

1. To analyze the data that how gen z people are spending time on their smart devices and to identify major usage activities (such as social media, entertainment, gaming, education, and communication).
2. To examine the challenges and impact of smart phones usage among gen z people on their lifestyle and behaviour which includes sleep patterns, academic performance, and social interaction.
3. To identify and analyze the key influencing factors on smartphone dependency among gen z.

IV. RESEARCH METHODOLOGY

The research uses primary data obtained from academic studies, survey reports, technology usage statistics, and global digital trend analyses about Generation Z. the research investigates smart phone usage patterns through two major components which include daily screen time and different usage activities the people use for social media and entertainment and education and communication and gaming purposes and all the ways that explore their life choices and factors lead to people being dependent on smart phones. The study investigates how generation z uses smartphones which results in specific daily life changes. Each objective of the study focuses on a specific dimension which results in specific daily life

changes usage patterns and behavioral,trends and challenges, impact and dependency factors . The combination of these dimensions enables researchers to comprehend how gen z people use smart phones while determining which smartphone usage practices need to be improved for responsible use. For the purpose of data analysis and presentation of results, bar charts and pie charts are used to represent comparisons and percentage distributions of smartphone usage patterns.

V. DATA ANALYSIS AND INTERPRETATION:

5.1 Objective 1: To analyze the data that how gen z people are spending time on their smart devices, and to identify the major activities, (such as social media, entertainment, gaming, education and communication.)

Average screen time:

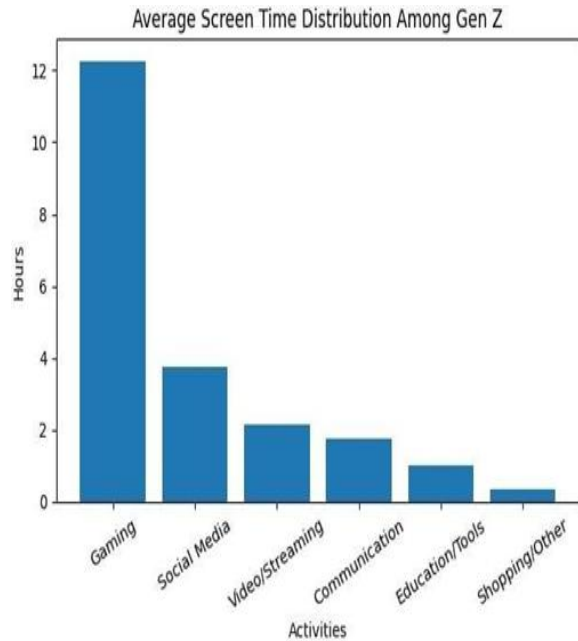
For Gen Z, the smartphone is the central hub of entertainment, communication, and learning. According to the secondary data which is collected from the referred papers an analytical study gives the average time spent on mobile usage by Gen Z is between 6-9 hours per day . This is s significantly higher than older generations.The activity table,analysis and pie chart is given below.

ACTIVITY	TIME SPENT	PRIMARY PLATFORMS
GAMING	12h 15m	Free fire,PUBG mobile, roblox
SOCIAL MEDIA	3h 45m	Tik tok, instagram, twitch
VIDEO/STREAMING	2h 10m	You tube, netflix, twitch
COMMUNICATION	1h 45m	Whats app, discord, message
EDUCATION/TOOLS	1h 00m	chatGPT, duolingo, notion
SHOPPING/OTHER	0h 20m	Amazon, temu, banking apps

Average calculation:

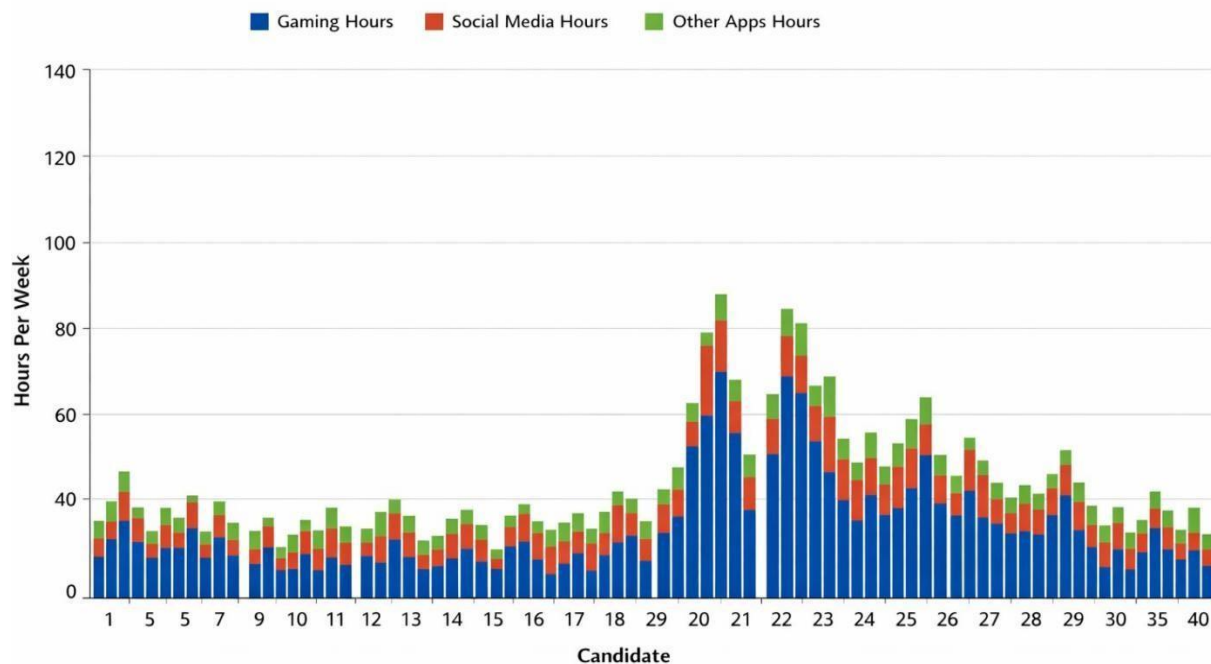
Gaming =12hrs 15min,Social media =3hrs 45min, video/streaming=2hrs 10min, Communication =1hr 45 min,Education /tools=1hr 00min,

shopping/other=0hr 20min, The average total screen time=21hrs 25min



According to the primary data which is collected from the 40 respondents(18-20 years), an analytical study gives the average time spent on mobile usage by Gen Z 16 hours per day . This is significance analysis and the bar graph is given below higher than older generations.The activity table.

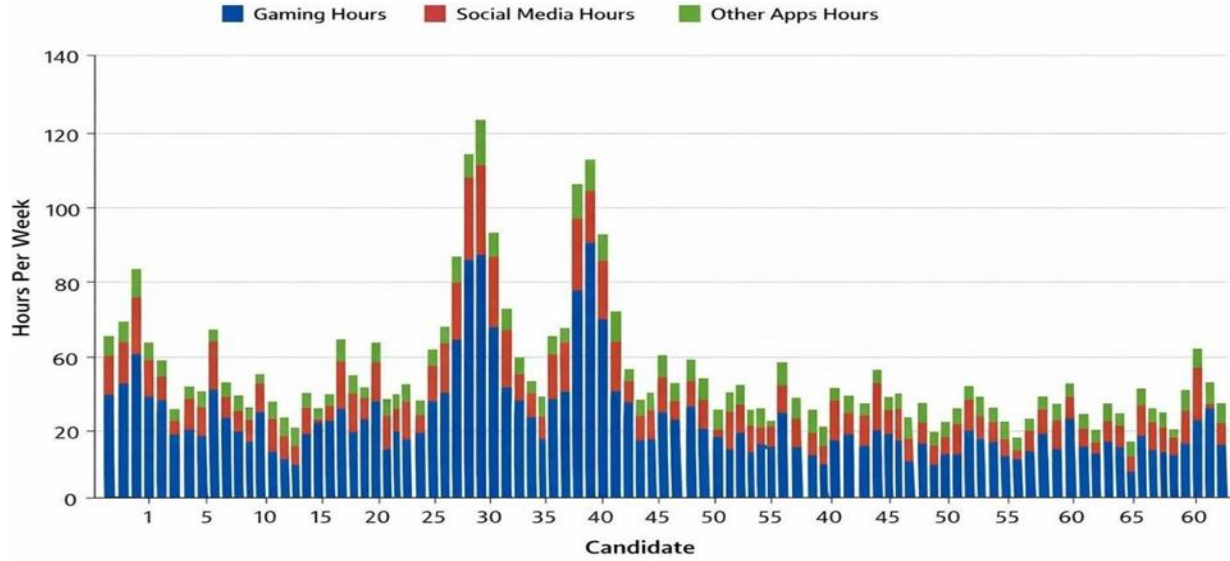
Weekly Activity Hours of 40 Candidates



Descriptive statistical analysis is used. The average (mean) screen time of the students was calculated for gaming, social media , and other applications. This method helps to summarize and analyze the collected data in a simple numerical form. This graph shows that

screen time differs widely among candidates, but gaming is the dominant activity. A few candidates have extremely high usage, which may indicate overuse of mobile devices.

Weekly Activity Hours of 60 Candidates



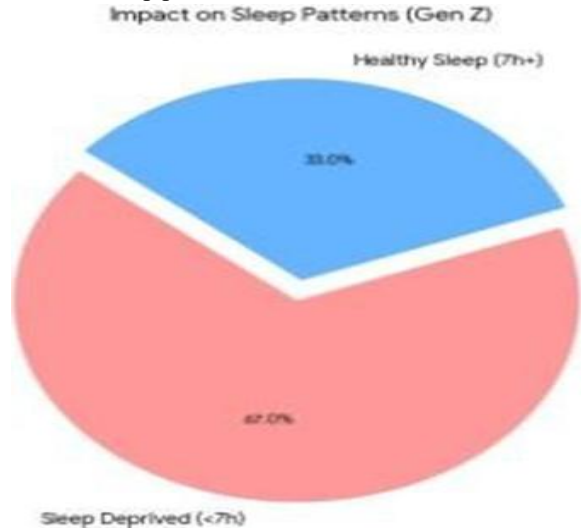
Here, the average gaming screen time is higher than the social media usage,

5.2 Objective 2: To examine the challenges and impact of smartphone usage among gen z on their lifestyle and behaviors, including sleep patterns, academic performance and social interactions.

report “doomscrolling” or late - night social media use, which contributes to insomnia and irregular sleep schedules.

- Emotional mediation: It shows negative emotions like anxiety, from online interactions, depression etc.

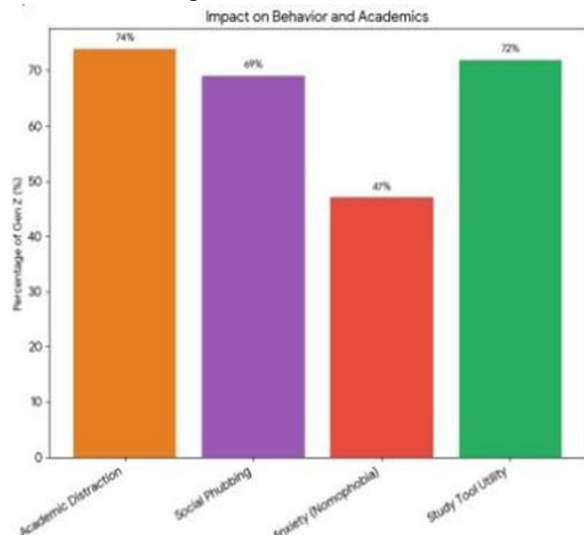
5.2.1 1. Sleep patterns:



Disrupted sleep quality: Excessive smartphone use, especially before bedtime, is linked to poor sleep quality and shorter sleep duration. Blue light exposure delays melatonin release (melatonin is a hormone that controls sleep) making it harder to fall asleep.

- Night- time scrolling: many Gen Z individuals

5.2.2. Academic performance reduced focus:



“Even though we have the world's knowledge in our pockets, the constant ping of the notifications makes it nearly impossible to actually sit down and focus on a single assignment for more than ten minutes”.

Digital distraction: Research highlights that smartphone overuse correlates with procrastination

and reduced productivity in academic settings. Mixed benefits: smartphones also provide access to educational apps, online resources, and collaboration tools, which can enhance learning when used responsibly.

Social interaction: While Gen Z is more 'connected' than any generation before, there's a real worry that we're getting better at sending memes than actually having a meaningful conversation in person".

{5.2.3} POSITIVE EFFECTS: Smart phones help maintain long-distance friendships and provide platforms like online education and for learning new ideas for self-expressions.

NEGATIVE EFFECTS: phones kill our focus on digital interaction can lead to social isolation, reduced empathy, and it unbalances our ecosystem difficulties in developing deep interpersonal relationships.

dimension	Positive impact	Negative impact
Sleep patterns	Easy access to relaxation apps	Sleep disruption, insomnia
Academic performance	Access to learning tools	Reduced focus, procrastination
Social interaction	Connectivity, self-expression	isolation, weaker face-to-face skills

5.2.4 ADVANTAGES:

Connectivity & Communication: Apps and social media smartphones allow Gen Z to stay connected with friends, family mainly when they are far away, and peers instantly through messaging. These smart devices are mainly helps in foster global communications

Access to Information & Learning: Educational apps, online courses, and digital libraries make learning more helpful. If we can't understand the video once, we can watch it for no time(Mainly it is helpful for studies) .Smartphones support multitasking and quick research, which can enhance academic performance when used responsibly in self-expression & social awareness.Platforms enable Gen Z to express creativity(videos, blogs, art) and advocate for social issues like diversity and inclusion, Convenience & productivity .Smartphones streamline daily tasks (banking, shopping, navigation).Productivity tools and reminders help with organization and time

management.

5.2.5. DISADVANTAGES:

Sleep Disruption: watching the smart devices at late nights and blue light exposure interface with melatonin production, it leads to decreased sleep time and irregular schedules.

Academic Distraction: by watching smart devices more, constant notifications and social media temptations reduce focus, and impair deep critical thinking.

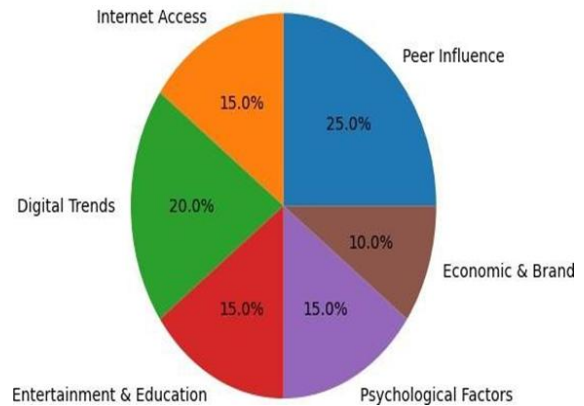
Mental Health challenges: Excessive usage of smartphones and social media causes anxiety, depression, and stress due to comparison culture and online pressures.

Social Isolation:Over reliance on digital communication can weaken face-to-face interaction skills, reduce empathy, and loneliness.

5.3. Objective 3: To identify and analyze the influencing factors on smart phone dependency among gen z .

5.3.1. Key Influencing Factors:

Key Influencing Factors on Gen Z Smartphone Usage



Peer Influence:

Peer influence is like an impact on individuals of the same age group. Its like being influenced by other actions or others attitudes or emotions. For example if your friend was using a new app or following a new style that influences your mind and you try to follow the same pattern.

Accessibility of Internet services:

Accessibility of internet services is to provide a good and available internet. And its like an easy to use the internet for smart devices. It is available for everyone

and everywhere. It gives access to use the internet.

Entertainment & Education Integration:

These smart devices are mostly used for entertainment purpose and educational purpose. For entertainment most of the gen z people reliable on games like free fire, or code blocks, and some other, etc And social media like Instagram, Snapchat, Facebook, Telegram, Twitter, linkedin, tik-tok, and etc And educational purpose they use smart devices for online classes, and some other are apps for learning, and some games for their passion example for fashion designing and smart devices were also used for researches, online classes, etc

Psychological & Behavioral factors:

Psychology and Behavioral factors are like a mind related reasons that makes people depends on smart devices. And its like constant checking for notifications like how these gen z people are are always scrolls their smart devices for time pass. It's like an curiosity and excitement and fear- out-missing something.

Lifestyle integration:

These smart devices are used for multitasking like education, entertainment, communication, research. These smart devices are involved much in our daily life. To communicate long distances or for online interviews we use smart devices mostly. For educationally they are used. And most of these people are using it for entertainment like gaming and social media. And these smart devices are not only tools but also symbols of social status.

VI. CONCLUSION

The analysis of smart phone usage patterns among 100 respondents revealed a clear hierarchy in screen time allocation.

The findings of the study highlight a clear trend: these genZ are increasingly spending more time on the smart devices with the significant portion of the screen time dedicated to gaming. This reflects on both positively and negatively like accessibility for online classes, libraries, research and more educationally, time consumption, and these are also effects on health issues. We took 100 respondents, 40 from primary data and 60 from secondary data. From primary data

we concluded genZ are spending more time on gaming and social media. that we have observed from primary data most of the respondents are spending on gaming (especially on free fire). And we took 60 respondents from secondary data using an AI tool. From secondary data most of the respondents are spending time on smart devices like gaming and social media. So we conclude most of the respondents are spending on gaming. We can use smart devices positively also. But most of the people especially these Gen Z people are using smart devices for their entertainment, and for their time pass.

VII. SCOPE FOR FURTHER

1. The use of smart devices among Gen Z will continue to increase with new technologies. It will move towards more responsible and productive usage.
2. Gen z (born 1997-2012) is shaping the future of smart devices usage through a demand for high performance, personalized, and eco- friendly technology.

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