Digital Dependencies: A Descriptive and Comparative Analysis of Technological Habits and Health Implications among College Students

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***Abstract*—During recent years most of us started to use the smart technologies and electronic gadgets even to fulfill every day-to-day life activities. This will help the human society in a great deal especially in the situation like COVID 2019. During the past five years especially the technology usage grows to a greater extent due to this COVID situation. Even now it extends to maintain the same level of technology usage. It is the right time to decide whether we have to continuously use the smart technologies or not, and it is friutful to discuss whether it has create any health implications to the human society. This research study tries to analyze this fact using the sample students' data. The results show that there is a little health impact issue due to the usage of technology and a few number of recommendations is given to avoid health implications due to the usage of technology.**

***Index Terms*—device usage pattern, health implication, time spent for technology, mobile phones, smart devices**

I. INTRODUCTION

Technology is nowadays different, playing a greater part in many details of our being-in-the-world tense. This has a particular significance even for college students. Besides assisting in academic endeavors including virtual lessons, research, and online assignment submission, technology has also saturated recreational activity from social networking sites, online dating, digital games, etc. With the rapid technological immersion into our world, one must be able to acknowledge why this is such a problem for kids today. This is a demography that is made up of highly techie and susceptible college students. Firstly, they use digital tools to enhance their learning abilities but also there is a possibility of overusing such technologies with accompanying health risks, as well it is quite difficult for them to combine using modern technologies with study in general. There are two key areas that will be investigated in this paper; the patterns of technology use among the college students and its effects on their health as well as their academic outcomes. The objective of this study is twofold: second, to offer a descriptive account of technical habit patterns demonstrating the extent and intensity of student interaction with digital gadgets. To provide a comparative analysis of the health impacts resulting from, which could act as a reference for the making of institutional policies, lesson plans, and students' welfare schemes.

II. Literature Review

Digital technology has changed the landscape of education through the introduction of various ways/tools and platforms for learning. Recent literature has discussed the omnipresent nature of technology in schooling and its effect on pupils' lives and learning.

The use of digital tools, such as e-books and specialized software, improves students' learning experiences, according to studies by Smith et al. (2019) and Richardson et al. (2019). Online platforms enable access to a vast reservoir of information, promoting self-paced learning and fostering collaborative environments (Haleem & Suman, 2022).

There is another side to the coin when it comes to digital distractions and academic performance. Technology according to Thompson (2015), especially social media and gaming, can be distracting. Digital distractions can affect students' academic performance, causing them to lose focus and become less productive (Dontre, A.J., 2021).

Health Implications of Prolonged Technology Use: The health ramifications of extended screen time have been a focal point in recent research. Green et al. (2020) found a direct correlation between prolonged device usage and ailments like eye strain, neck pain, and disrupted sleep patterns. Additionally, the sedentary nature of technology-driven activities poses risks of obesity and related health issues (Dixit & Nandakumar, 2021).

Balancing Technology and Academics: Many students still find it difficult to strike equilibrium between the use of Technology and studying. As cited in Lewis (2019), integrating technology into learning should always have a purpose-based approach that supports and does not impede the instructional objectives. Specifically, institutions have a vital role in guiding students to effectively use technology that will support and not disrupt their learning.

Evolving Dynamics of Education in the Digital Age: With time, understanding of how students relate to technology in a digital age as education evolves is necessary. Although past research was important, there is a need for ongoing research due to constant changes in technologies.

III. Methodology

A. Research Design

The use of descriptive and comparative design with a structured student questionnaire to assess technology habits, associated health impacts, and the impact on academic attainment.

B. Sample Selection

This study involved college students from different states and streams. The conveniences sampling was utilized, based on college student's referral channels as part of an anonymous peer-to-peer email distribution. However, a random sample of 200 responses collected is regarded for this study.

The main source of data collected was through an online self-administered questionnaire. There were both closed-ended and open-ended questions in this questionnaire, designed to capture:

- Demographic details of the respondents
- Types and frequency of device usage
- Duration of technology usage for academic and non-academic purposes
- Perceived effects on health due to technology usage
- Strategies employed by students to balance technology with academic activities

This is how it was made accessible for a large number of respondents by hosting the survey on a specific platform such as Google Forms and sending it through social media, emails, and chats. The information was extracted and compiled after leaving the survey open for some days.

Descriptive statistics such as frequencies, percentages, and mean were used to analyze the data. Chi-square tests (or other appropriate tests) were employed in the identification of considerable variations between gender, academic stream, and state groups. The analysis was accomplished with Python and R.

The participants were informed about the study purposes, and the participation was entirely voluntary. All of the information was provided by anonymous people while no one's personal details were disclosed at any stage of the research. Data was held in confidence by all means.

The main data points from the survey are:

- Demographics (Gender, Course and Streams, and States)
- Device usage patterns
- How do you spend your time? On technology for academic uses and leisure or non-academic purposes?
- Adverse health effects following digital gadgets use The post-health Implications Reported Due To Technology Use appeared first on essay4me.com
- Balancing between technology and academic activities

Once the data are extracted and summarized, visualization is created to support the findings. Based on the demographic distribution, the data are given as below:

- Gender: Male – 69%, Female – 31%
- Course stream: CS/IT – 43.5%, EEE – 17%, Mechanical – 15%, Medical – 7%, ECE – 6%, Law, Arts, Commerce – 3% each, Civil – 1.5%, Agriculture – 1%
- State: Tamil Nadu – 40%, Punjab – 31%, Karnataka – 12.5%, Rajasthan – 8.5%, Uttar Pradesh – 8%

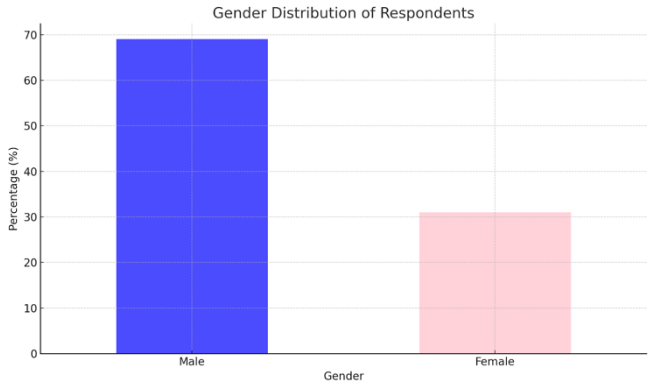

Figure 1. Gender Distribution

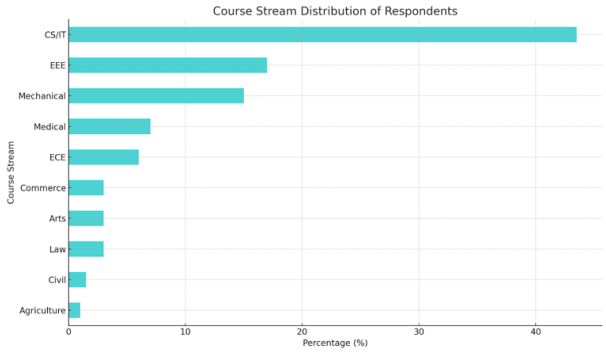

Figure 2. Course Stream Distribution

Smart phone is the widely-spread device used by most respondents. Desktop computers experience another form of popularity but laptops rank higher in this regard. Other devices, including tablets, have a lower usage percentage for the respondent.

Many participants reported spending one or two hours on a daily basis using technology for academic work. It subsequently finds some distribution that is relatively uniform among various time categories. Respondents who

use technology for non-academic purpose are represented by 1-2 hours subcategory. It is interesting to note that quite a number of students use more than four hours per day for other non-educational uses of technology suggesting that its recreational role in their lives cannot be overemphasized.

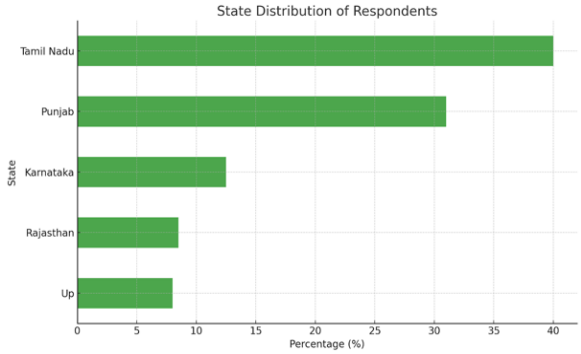

Figure 3. State Distribution

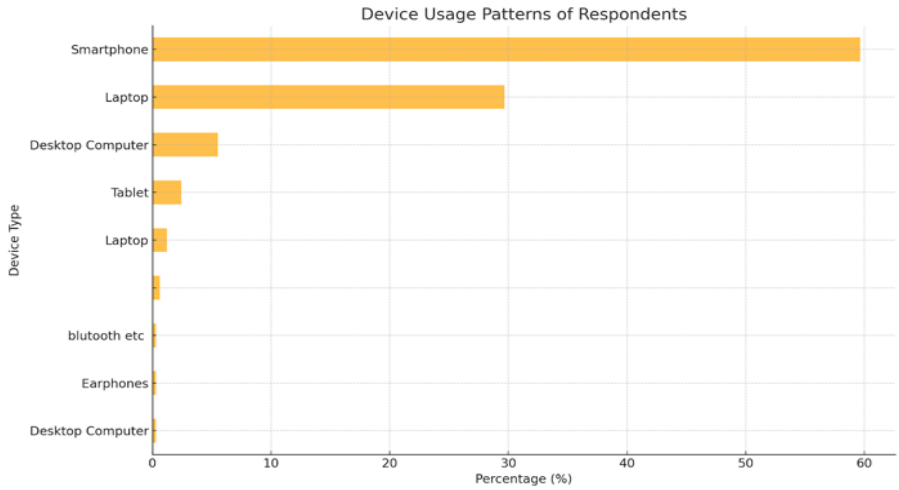

Figure 4. Device usage pattern Distribution

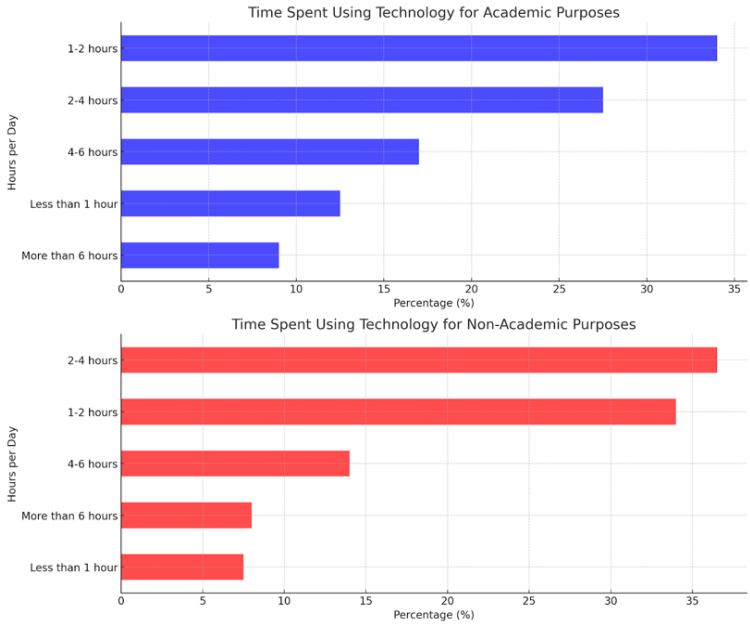

Figure 5. Time spent using technology

C. Health Implications Reported

Many respondents asserted that they experienced physical ill effects associated with technology use, for example, eye soreness, backaches, etc. however, a much lower proportion claimed to have had no such health repercussions. In addition, it shows the possibility that long-term or wrongful usage of technology may be harmful. Students utilize tactics to strike equilibrium between technology usage and academics. A considerable proportion of respondents prioritize other activities over technology, indicating a conscious effort to manage their time effectively. Another segment prioritizes technology over other activities, suggesting a potential reliance on digital tools for their academic and personal endeavors. Some respondents reported a balanced approach, ensuring that neither domain overshadows the other. These insights underscore the diverse strategies students adopt to navigate the challenges and opportunities presented by technology in the academic setting.

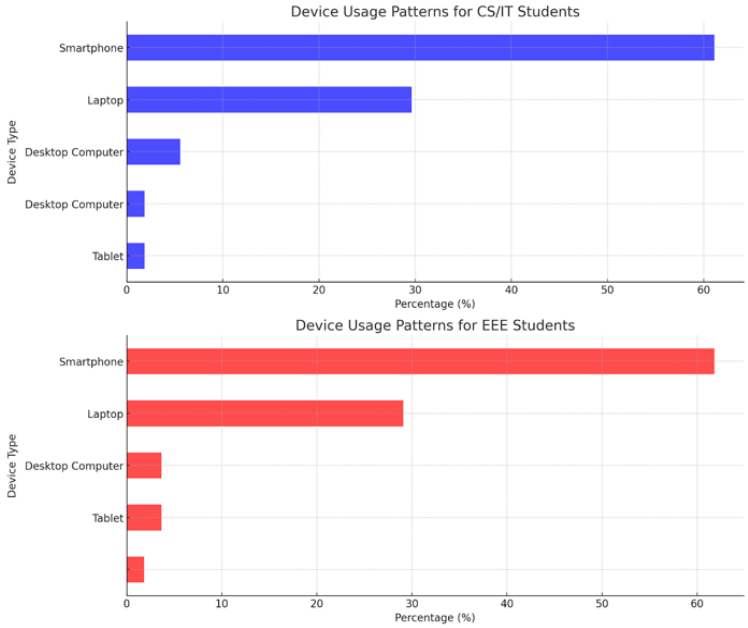

Figure 6. Device usage pattern for CS/IT students and EEE students

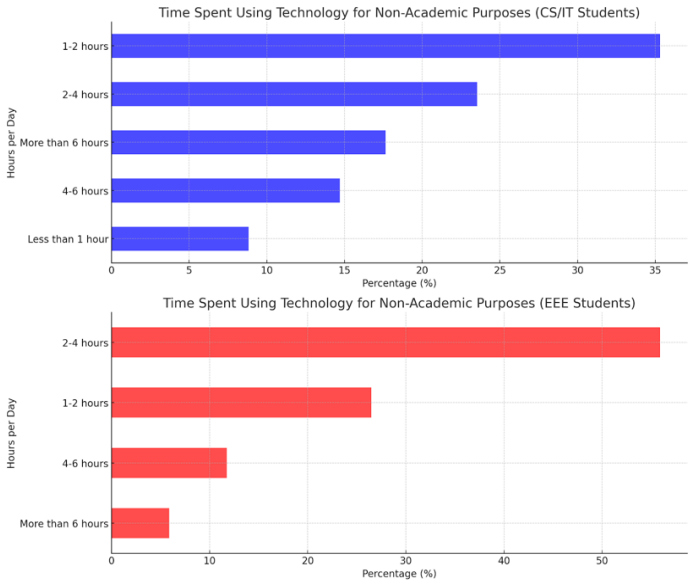

Figure 7. Device spent for non-academic purpose

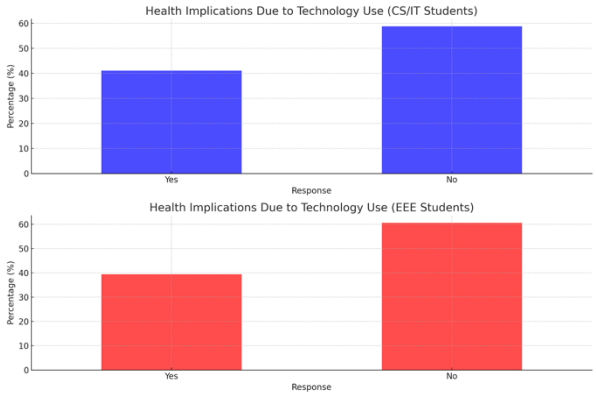

Figure 8. Health implications due to technology use

To perform a comparative analysis between CS/IT (Computer Science/ Information Technology) students and EEE (Electrical and Electronics Engineering) students are considered with equal random samples. These two samples are examined with various parameters such as use of technology devices, time spent on technology, and health implications. The device usage pattern is shown in figure 6. The time spent on technology is shown in figure 7. The report health implications due to technology usage is shown in figure 8.

As per the figure 6, it is noted that more than 50% of CS/IT students use technology for 1-2 hours a day for academic work. Some of them involved more than 4 hours. It is same in the case of EEE students also. In both the cases, the students who use gadgets are using the technology for more hours.

As per the figure 7, it is noted that more number of students from CS/IT use technology for non-academic purpose when compared to the EEE students. As per the figure 8, it is noted that most of the CS/IT students suffer from technological-based physical ill-health conditions and minority noted with no effects on their health. EEE students also shared the same regarding the health implications similar to CS/IT students.

D. Gender-based comparative analysis

The sample data considered are having up to 138 male respondents and 62 female respondents. The gender-based comparative analysis is performed with device usage pattern, time spent for technology use, and the health implications.

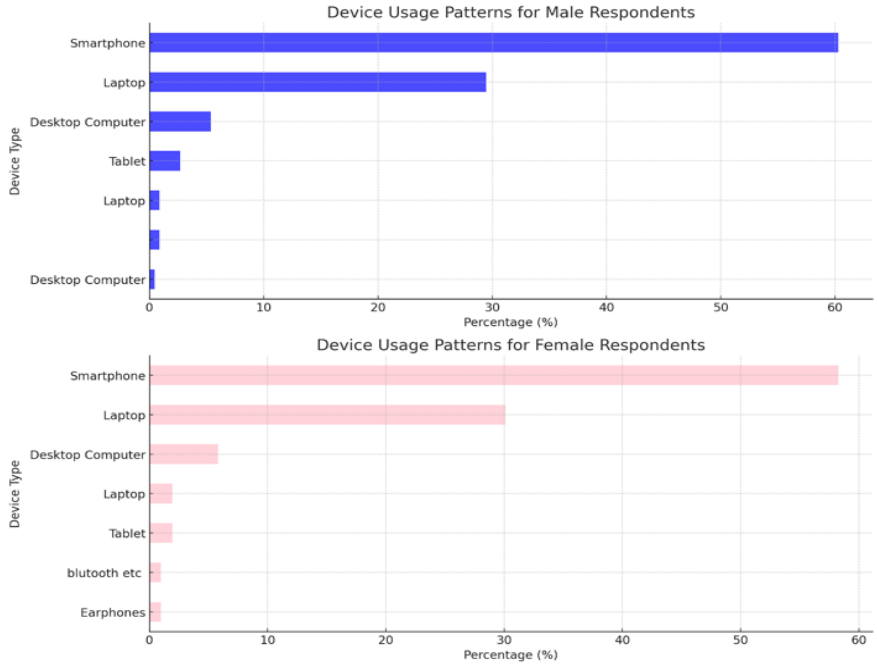

Figure 9. Device usage pattern for male and female respondents

From the male respondents, it is noted that the most popular device is smartphone, and the second most used device is laptop. Although it is less widespread, desktop computers and tablets also have a representation. Similarly, from the female respondents, smartphones and laptops are the leading devices in the device usage pattern. Female respondents use tablets a little bit more than do the male respondents. The percentage of women using the desktop computers is much smaller.

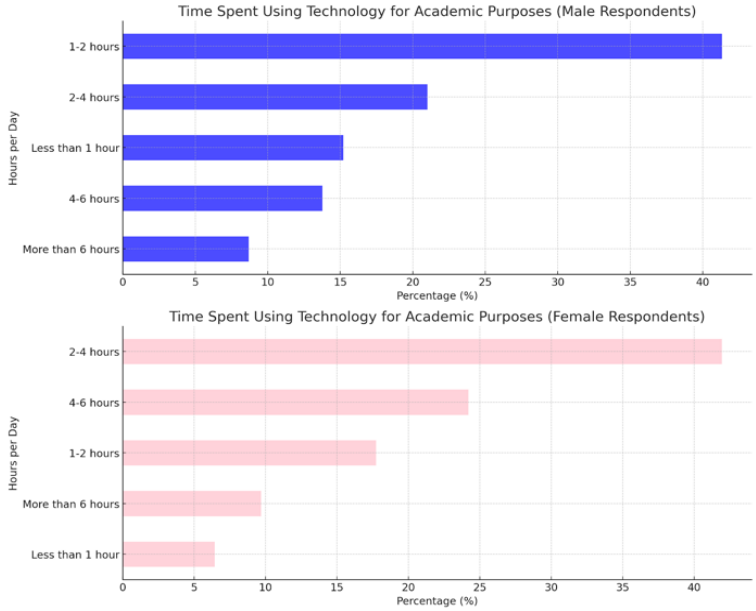

Figure 10. Time spent for academic purpose by male and female respondents

It is noted that, most of the male respondents spend an average of 1-2 hours per day using the technology for their academic purpose. The number of female respondents is higher who spend more than 4-6 hours when compared to the male respondents.

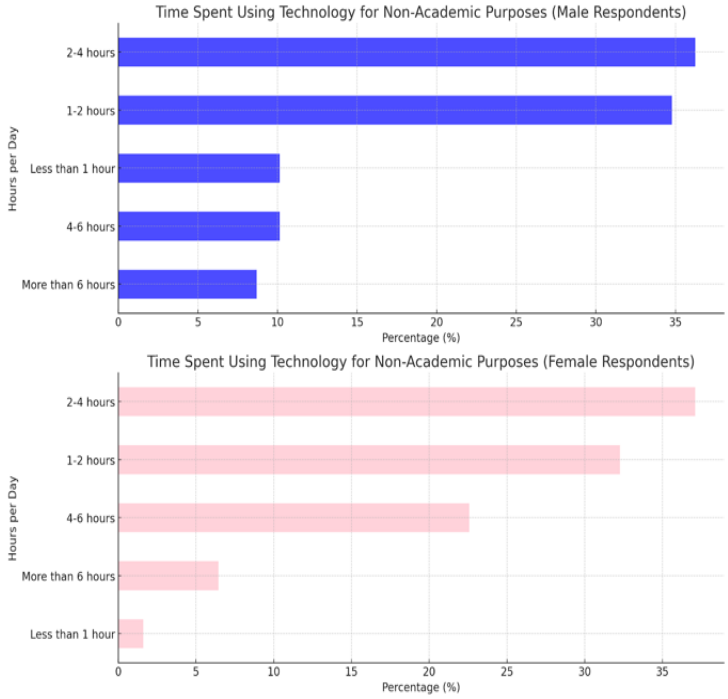

Figure 11. Time spent for non-academic purpose by male and female respondents

The number of male respondents who spent time for non-academic purpose of up to 2-4 hours is mostly the same when compared to the female respondents. Whereas the time spent more than 6 hours for non-academic purpose by

male respondents is higher than the female respondents. The time spent for non-academic purpose by male and female respondents is given in figure 11. Similarly the health implication is given in figure 12. It shows that the female respondents had more health implications than the male respondents.

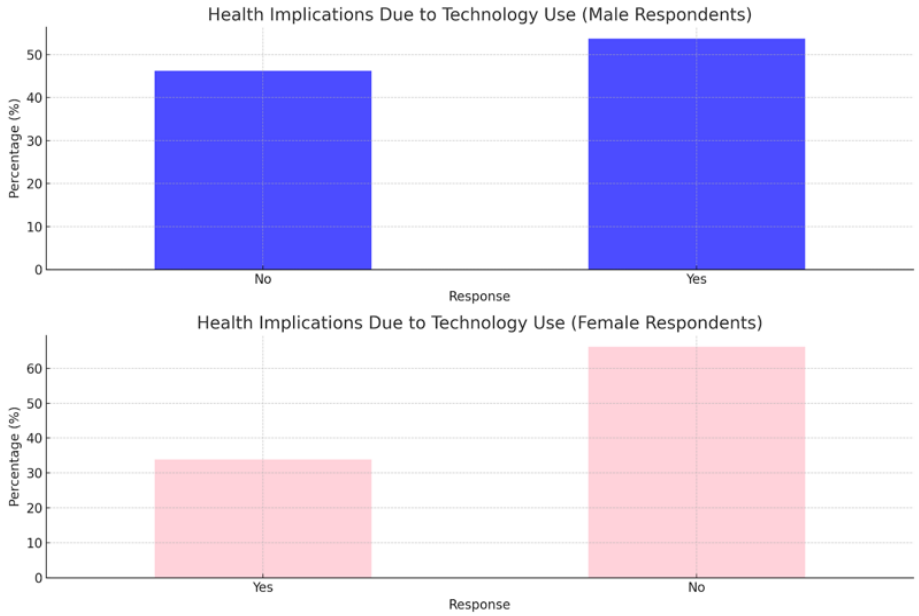

Figure 12. Health implications due to the technology use by male and female respondents

E. Recommendations

The sample data and its analysis based on various parameters like device usage pattern, time spent using technology for academic and non-academic purpose, and health implications due to the usage of technology. The following points are recommended to have a good impact of using technology:

i) Educational institutions can draft policies that promote equal use of digital technology by developing balanced technology use policies. Digital devices should be incorporated into teaching policies in a way that maximizes learning while minimizing potential health hazards

ii) Awareness and Education Programs: Devise educational programs for students on the dangers of indiscriminate use and overuse of technology

iii) Support Services for Technology Management: Students need to be assisted with such auxiliary services like counseling, workshops, etc., to aid in managing technologies utilized

iv) Incorporate Digital Well-being into Curriculum: Ensure digital well-being forms part of curriculum and teach pupils how they can be responsible in usage of technology. For instance, it may consist of classes on cyber ethics, time consciousness, and the significance of doing things beyond a computer screen

v) Research and Monitoring: Keep conducting and reviewing studies on ways that children's health can be affected by technological usage, and their educational achievements. The continued research will provide for revision of relevant policies as well as education practices that are updated to match with the changing digital environment.

vi) Customized Approach for Different Streams: Tailor programs and policies for the respective groups as the study brings out varying technology use and health implications among students from different academic streams.

vii) Promote Physical Activity and Offline Interactions: Promote, and stimulate physical movement and close contact among students in order to balance the sedentary character of computer based activity and foster a healthy sociable student environment.

viii) Parental and Guardian Involvement: Involve parents/guards on the importance of having balanced technology utilization and the need for them to assist learners in having healthy digital practices.

ix) Technology-Free Zones and Times: Create technology free areas or moments on the campus so as to help their students not to relate with technology all times thereby enhancing varied experiences during their stay in the campuses.

x) Focus on Mental Health: Provide enough mental health support and resources to help in dealing with mental distress, which can result from excessive technology use such as anxiety, depression, or disrupted sleep patterns.

IV. CONCLUSION

This study has presented an in-depth exploration of the intricate interplay between technology use and multidimensional effects on college pupils. The findings show that there are vast dissimilarities between different academic areas with respect to use of devices, duration of technologies and the outcome concerning health while necessitating a moderate attitude towards computerization in learning institutions. With advancing time and the growing digital age, educational institutions are required to devise strategies on how they can harness technology in a way which will promote good health among students while also enhancing their academic performance.

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