

# Smartphone Ownership and Use Among Primary School Students in Sweden: A Student-Led Survey

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## Abstract

The study examines the factors that affect students' choices regarding phone ownership, device selection, and usage. The aim is to better understand the reasons behind these preferences—particularly related to phones—and how they vary with age among students aged 9 to 13 in a Swedish school.

The information was collected through a digital survey containing a mix of multiple-choice and short-answer questions. This approach provides students with structured response options while also allowing them the freedom to express their views about their choices and its usage related to personal electronic devices such as phones.

The findings show a clear increase in both phone ownership and brand preference with age. Additionally, the study reveals a gender bias in phone color selection and highlights differences in the reasons behind phone usage across different age groups.

This study offers valuable insight into the digital behavior of younger students in a Swedish school context, aligning with trends observed internationally. The results provide a foundation for future research on the impact of device use on students' academic performance and personal development.

\*These authors contributed equally to this work. They completed their research when they were 12-13 years old and while in Year Level 6 at Internationella Engelska Skolan Krokslätt, Göteborg, Sweden.

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**Keywords:** smartphones, student preferences, electronic device usage, gender differences, primary education, Sweden, children and technology

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## 1. Introduction

Students today are more connected with each other and the world around them due to the development and easy access to digital technology, particularly smartphones and the internet. According to a report published by the UK government, 99% of children spend time online, and 9 out of 10 children own a smartphone before the age of 11 (UK Parliament, 2024). A similar trend is observed in other countries, such as Sweden, where 30% of 11-year-olds reported screen time exceeding 4 hours per day, compared to 51% of 15-year-olds (Dahlgren et al., 2021). Additionally, the 2023 Global Education Monitoring Report by UNESCO highlights that smartphone use among students often leads to distractions and negatively impacts learning, emphasizing the need to regulate and control smartphone usage both inside and outside school environments (UNESCO, 2023).

There are various reasons behind smartphone exposure among children aged 9-12, ranging from necessity (e.g., contacting parents and friends), educational purposes (e.g., schoolwork), and entertainment (e.g., video games, social media, and videos) (Özkul, 2022). Although studies have examined the effects of smartphone use on the mental health of students aged 9-12, particularly during the COVID-19 pandemic, as well as the impact of smart devices on learning ability and academic performance, much less is known about how smartphone preference develops in this age group. This includes preferences for specific types or aesthetic appeal, and how their usage patterns have changed during the given time frame (Hong et al, 2021; Adachi et al., 2022; Rideout et al., 2019). Recognizing the gap in the field, this study aims to investigate the reasons why students of this age group choose smartphones and their most common purposes for using smartphones. This study also focuses on identifying patterns in phone preferences and usage of these devices across different age groups. Our research was divided into two main parts: the first focused on smartphone selection criteria, and the second explored the general use of smartphones for their daily life.

Our investigation reveals that smartphone usage increases as students grow older, with a clear preference emerging between iPhone and Android devices. Furthermore, the use of smartphones and computers varies, encompassing activities such as schoolwork, contacting parents or friends, and engaging with social media.

## 2. Methods

This research study explores changes in the perception and preference of smartphone devices among students aged 9 to 13 years. The work focused on identifying differences among students from four year levels (YL3 to YL6). This was accomplished through a digital survey that included questions related to their preferences for smart devices and their usage.

## 3. Survey design

The student survey was designed to explore changes in perception towards smart devices, especially phones, and their usage. The survey, developed by the students themselves, is concise, time-efficient, and available in both English and Swedish. It features clear response options and uses visual aids, such as pictures, to enhance question comprehensibility wherever possible. Given the large sample size (411 students), multiple-choice questions were included. These well-defined, close-ended options encourage critical thinking and help students select the most relevant answers, reducing the likelihood of neutral responses. This quantitative approach also facilitates the evaluation of responses, especially for quantitative questions such as "how many," resulting in more objective data. It simplifies the identification of patterns and



themes without external bias, thus making the outcomes more reliable.

The student survey is done via Google forms and consists of 10 questions, 9 of which are multiple-choice and the last is a short open-ended question.

The student survey focuses on the following main areas:

- Information about their gender and year level;
- The type of phone the students are using—for example, Android or iPhone; and
- Students' phone preference, the reasoning, and its usage.

**Table 1:** List of Questions Included in the Google Survey.

Question	Question type
What year level are you in? / Vilken årskurs går du i?	Multiple-choice
What is your gender? / Vad är ditt kön?	Multiple-choice
Do you have a phone? / Har du en mobil?	Multiple-choice
Do you have an Android or iPhone? / Har du en android eller smartphone?	Multiple-choice
Why do you have that phone? / Varför har du den mobilen?	Multiple-choice
What phone would you rather have than the one you currently have? / Vilken mobil skulle du hellre ha en den som du har just nu?	Multiple-choice
What color is your PHONE? / Vilken färg är din MOBIL?	Multiple-choice
Do you think you spend more time on electronic devices or schoolwork? (BE HONEST) / Tror du att du spenderar mer tid på elektroniska apparater eller skolarbete? (VAR ÄRLIG)	Multiple-choice
What do you usually do on the electronic devices? / Vad brukar du göra på elektroniska apparater?	Open-end question



### 3.1 Participant selection

The subjects (students) were selected randomly and had the freedom to choose whether to participate in this survey. A total of 411 students from year level 3 to 6 (ages 9-13) participated, and they were given ample time to complete the survey. The reason for selecting these students is to investigate the changes in the preference of the phones and its usage among students with different age groups. There was no sampling bias related to students' academic ability, interests, or ethnicity, as all students were given an equal opportunity to participate in the survey.

### 3.2 Implementation in the collection of data material

The students were informed in advance about the type of survey and its objectives. They were given the opportunity to ask questions about the survey and its content. Each question in the survey was explained in detail to the students, and any related queries were addressed. The survey was bilingual, allowing students to respond in the language in which they felt most comfortable expressing themselves. It was shared via their school Gmail accounts and designed using Google Workspace, which is familiar to them. Once the students began the survey, they were given ample time and the opportunity to complete it in a calm and safe environment. Pedagogical support was provided as necessary during the survey.

### 3.3 Implementation in the analysis of data material

Once the data were collected, the information was sorted based on the responses to each question. The data from the student survey were analyzed and visualized using Google Sheets and Google Charts. Primarily, Google Charts (specifically pie charts and bar graphs) were utilized for data obtained from multiple-choice questions because they provided a clearer depiction of the information, thus making it easier to compare with other data sets.

For qualitative questions such as "What do you usually do on electronic devices?" The responses were collected, interpreted, and organised into categories based on frequent, dominant, and significant themes that emerged (**Fig. 3**). The inductive method of qualitative data analysis, as described by Thomas (2003), was used to organise the raw data. This method relies on analyzing the data without any preconceived ideas or theories, thus providing flexibility and allowing the raw data to guide the research analysis in order to identify emerging patterns, themes, and concepts.

The overall response rate for the survey was above 90% for YL3, YL4, and YL6 students, while the response rate for YL5 students was 65%. The lower response rate for YL5 was due to the inability to find an appropriate time to conduct the survey for all students in that year group. Additionally, in YL6, out of the 150 responses collected, only 128 were considered valid and used for all statistical analyses. The remaining 22 responses were incomplete and therefore excluded from the data analysis.

It is crucial to maintain ethical standards in research, ensuring that all participants are fully informed about the study and their rights from the outset. This practice guarantees that their information is managed responsibly (Christoffersen & Johannessen, 2015). We will establish strict rules to limit access to this information and prevent any unauthorized alterations. We will not include personal details such as names, grades, or information about additional support received

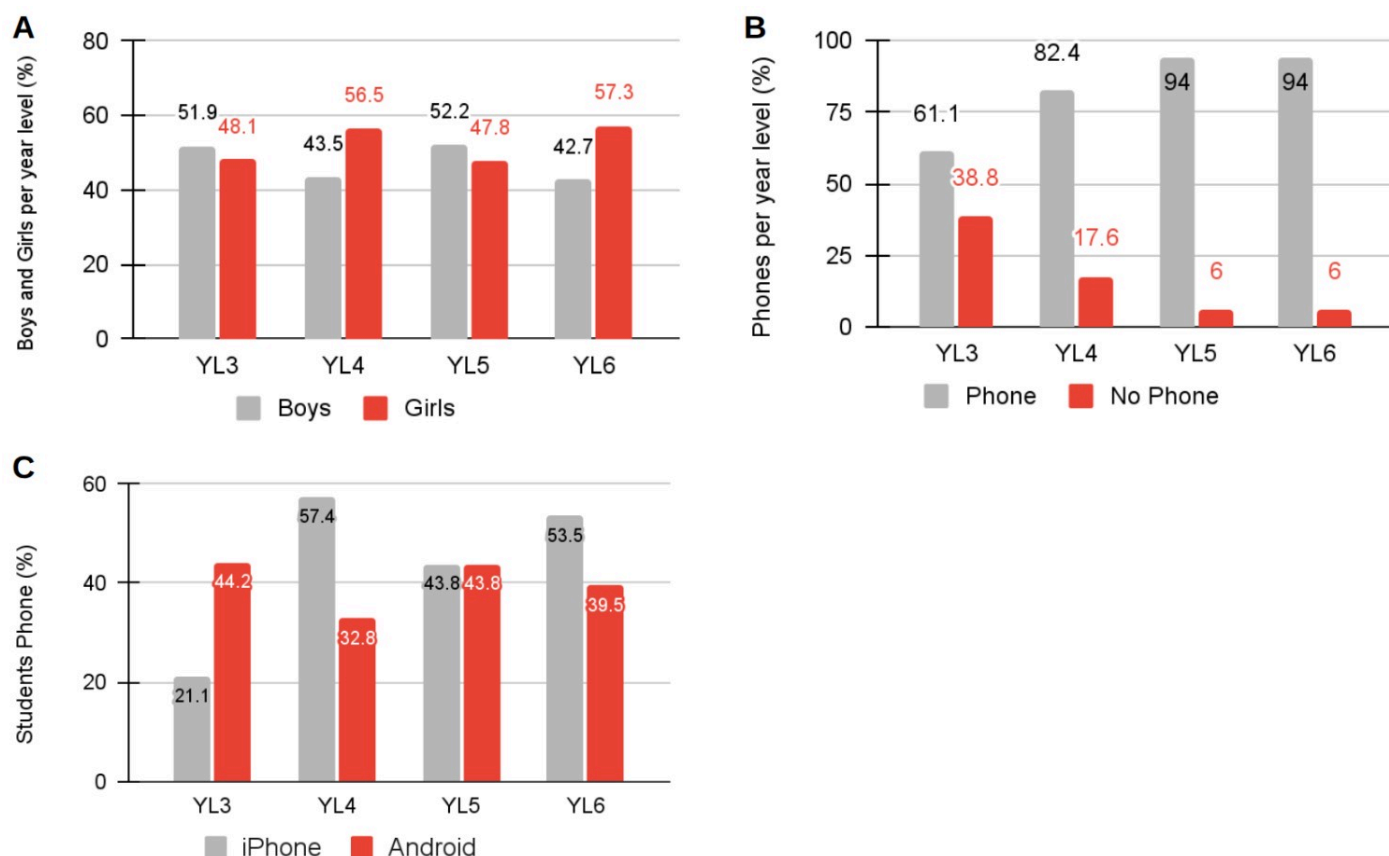


in the study. The survey was designed to avoid collecting participants' email addresses or names. It was conducted using the school's Google Workspace, which complies with local and GDPR regulations applicable to school environments, thereby ensuring the privacy of the minors involved in the research.

## 4. Results

### 4.1 Student phone ownership and device preferences by gender and year level

To determine whether the age of students influences their likelihood of owning phones and to identify any patterns of selection bias between iPhone and Android users, the survey results reveal clear patterns in both criteria. Across all year levels (YL3-6), there is nearly an equal number of male and female students participating in the survey (**Fig. 1a**), thus contributing almost equally to the survey outcomes. It is interesting to note a clear trend in the likelihood of owning phones as students age, with 61% of YL3 students having phones compared to 94% in YL5 and YL6 (**Fig. 1b**). Notably, there is a significant jump from 61.1% of students having phones in YL3 to 82.4% in YL4 (**Fig. 1b**).



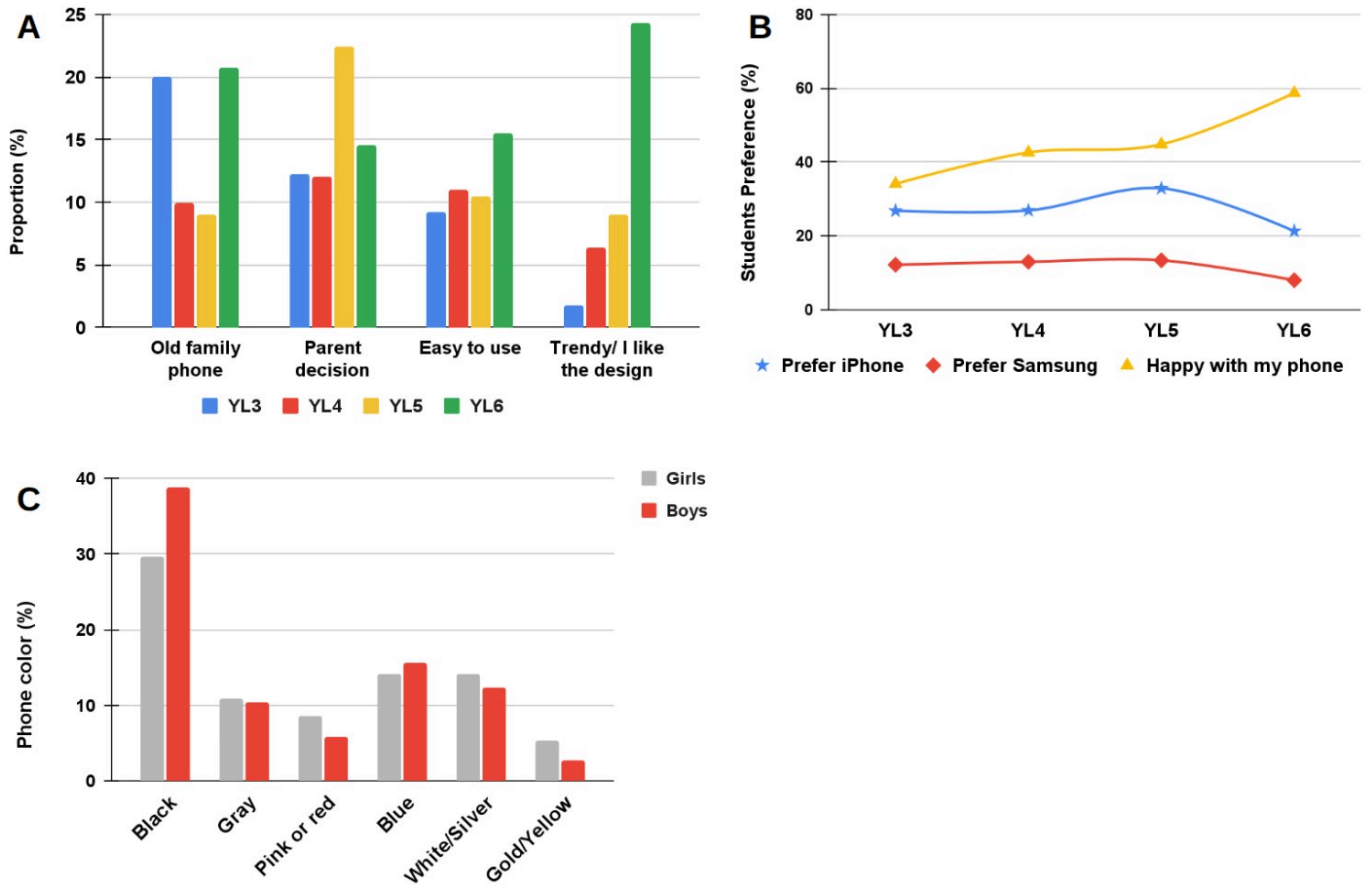
**Figure 1:** Panel A displays the percentage of female and male students across different year levels (YL3 to YL6), with the total number of students surveyed per year level provided as follows: YL3: 108, YL4: 108, YL5: 67, YL6: 128. Panel B illustrates the percentage of students who own phones in each year level. Panel C represents the distribution of students owning Android or iPhone devices.



In **Fig. 1c**, 44.2% of YL3 students use Android phones compared to iPhones, whereas iPhone usage becomes more prevalent in YL4 (57.4%) and YL6 (53.5%) students. In contrast, YL5 students show no significant difference in the usage rates between iPhones and Android devices.

#### 4.2 Analysis of student phone trends: motivations, preferences, and colors by age and gender

To understand the reasoning behind students' choices in acquiring and selecting the type of phone, we asked them why they chose their phone and provided multiple options to select from. The results show the top four response categories among all the students who responded (**Fig. 2a**).



**Figure 2:** Panel A depicts the percentage of student's reasons for owning phones. Panel B illustrates students' phone type preferences as percentages, representing desired rather than currently owned models. Lastly, Panel C displays the predominant phone colors among boys and girls across various year levels.

Interestingly, for YL3 students, using an old family phone is the major deciding factor, while design/popularity is the least important factor. On the other hand, both old family phones and popularity are major factors contributing to phone type



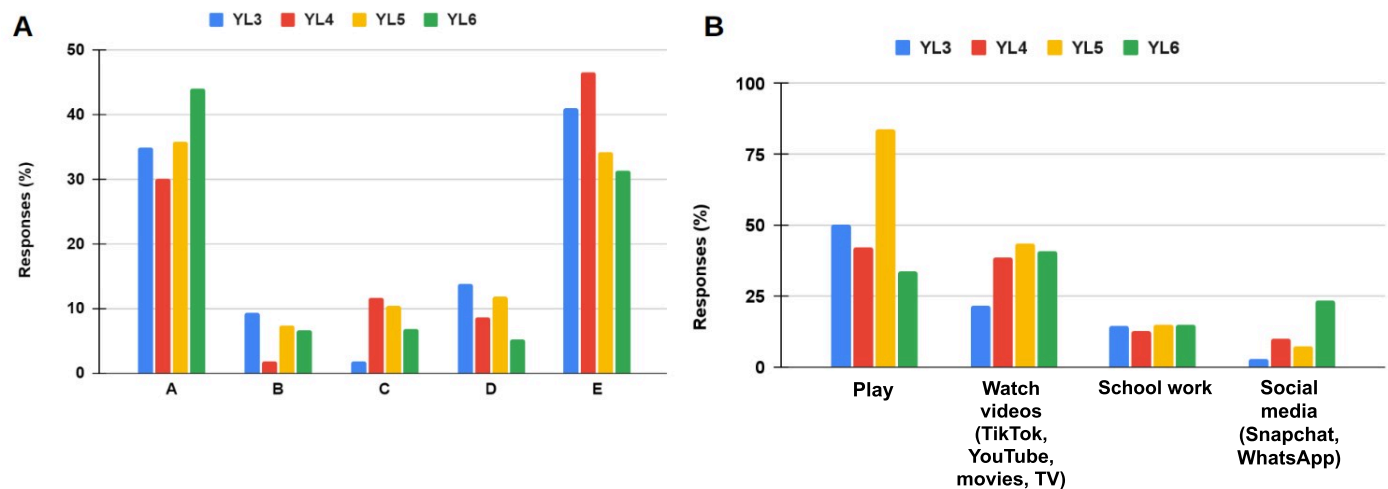
selection among YL6 students (**Fig. 2a**). Furthermore, parents' decision is the main reason given by YL4 students, and ease of use is the leading reason among YL5 students (**Fig. 2a**). A chi-square test of independence was conducted to examine the relationship between year level and reasons for phone ownership. The association was statistically significant,  $p = .0023$ , indicating that the distribution of reasons varied significantly across year levels.

Additionally, students were asked if they are satisfied with their current phone or if they would prefer to switch to either an iPhone or a Samsung phone (Android). Interestingly, students in every year level prefer to switch to an iPhone over a Samsung phone. However, the majority of students are satisfied with their current phones (**Fig. 2b**). YL6 students are the most satisfied with their current phone, whereas YL3 students are the least satisfied (**Fig. 2b**).

Furthermore, we investigated whether there are color preferences influenced by gender norms among students. The results show that black is the most common phone color among students, with 9% more boys preferring this color compared to girls. On the other hand, girls show a slight preference for pink/red and gold phone colors (**Fig. 2c**).

### 4.3 Student's time management and electronic device usage patterns

To understand students' preferences for using electronics (phone, TV, and gaming console) in their daily lives and their time management between phone usage and other activities, students were asked to answer questions about their electronic usage and its purpose. The responses revealed that nearly equal proportions of students across all year levels spend significant amounts of time using electronics and doing schoolwork compared to engaging in other activities or balancing both schoolwork and electronics equally. A small proportion of students reported not focusing on either schoolwork or electronics at all (**Fig. 3a**).



**Figure 3:** Panel A displays the percentages of students spending the majority of their time on electronic devices or school work, categorised into different groups: A: Spend more time on electronics; B: Do not focus on either electronics or school work; C: Focus equally on both; D: Focus on activities other than electronics or school work; E: Spend more time focusing on school work. The response includes all the students irrespective of them having a phone. Panel B displays the percentage of students across year levels who primarily use their electronic devices for various purposes.

Interestingly, more students in Year 6 (41%) spend greater amounts of time on electronic devices compared to studying (31.4%). In contrast, Year 4 students tend to spend more time studying (46.6%) than on electronics (30.1%) (**Fig. 3a**). This difference is statistically significant ( $p = .029$ ), based on the chi-square test of independence used to determine whether students' self-reported focus (between electronic devices and schoolwork) varied across year levels (YL3–YL6).

To identify the reasons behind students' use of electronic devices, they were given predetermined options to select from. The majority of students across all year levels reported using electronics primarily to play video games and watch videos, while a smaller percentage indicated using them for schoolwork or accessing social media. Notably, there is a significant increase in the number of Year 6 students using social media (23%) compared to students in younger year levels (**Fig. 3b**). The observed differences in students' use of electronic devices across year levels (YL3 to YL6) are statistically significant, as indicated by the chi-square test of independence ( $p < .001$ ) on the data obtained.

## 5. Discussion

The findings of these studies indicate that various factors determine and influence students' decisions regarding the use and appearance of the phones they choose, as well as the use of electronics (phones and computers). Additionally, some of these findings align with those of previous studies.

### 5.1 Phone Ownership Trends

The results show a clear correlation between student age and phone ownership, with ownership increasing significantly from 60% in Year Level 3 to 82.4% in Year Level 4, and reaching 94% among Year Level 6 students. These findings align with the observation (after school activity personal) that most Year Level 3 students are often accompanied by parents, whereas older students typically travel independently to and from school and need phones to stay connected with friends and family.

A similar trend was reported by Rideout et al. (2019), who observed a substantial increase in phone usage, rising from 26% to 69% among children aged 9–12. Likewise, Perowne & Gutman (2023) demonstrated that parental decisions to provide phones during this period are largely driven by practical or safety-related considerations. On the other hand, there is no significant difference in the proportion of boys and girls owning phones across different year levels.

### 5.2 Device Preferences and Motivations

The analysis of the findings indicates age-dependent effects on device preference and differences in motivation. For younger children (e.g., Year Level 3), parents tend to decide on the device, often opting for a cost-effective approach such as providing an older phone. This aligns with studies showing that families typically adopt cost-effective strategies when acquiring technology for younger children (Livingstone & Blum-Ross, 2020).

In contrast, older children tend to prioritize the social status of brands when choosing their phones. A similar tendency is observed among adolescents, who place greater importance on brands and social status when shopping for themselves (Misuraca et al, 2021).



Additionally, older students exhibit higher levels of satisfaction with their phones compared to younger students. This is consistent with the fact that older students have greater decision-making freedom when choosing their devices, although more students want to switch their phones to iPhones instead of Androids suggesting a brand bias. This shift may be influenced by various factors such as peer pressure, brand image, word of mouth, or lifestyle. Interestingly, Heri et al. (2025) found that word of mouth is more influential than brand image in shaping teenagers' smartphone purchasing decisions. In contrast, other studies have shown that brand image, ease of use, and product features are among the primary factors affecting teenagers' purchase intentions (Yang et al, 2025). It will be interesting to see in future research whether these factors also play a significant role in the decision-making processes of young Swedish students.

### **5.3 Gender Differences in Aesthetic Preferences**

The study found a gender difference in phone color preferences (described as aesthetic preferences), with boys tending to prefer black phones, while girls showed a stronger inclination toward red, pink, and gold/yellow. These findings highlight the influence of established gender color associations on students' phone color choices, shaped by social norms and marketing strategies (Ben-Zeev & Dennehy, 2014).

### **5.4 Electronic Usage and Time Management**

The findings of these studies on time management between the use of electronic devices (phones and computers) and schoolwork reveal an age-dependent shift. Younger students prioritize school work, whereas older students spend more time on electronic devices. For instance, Year 6 students spend more time on electronics (41%) compared to Year Level 3 students (31.4%).

This aligns with previous research, which indicates that phone usage tends to increase as students grow older, reflecting a gradual age-related shift (Anderson & Subrahmanyam, 2017). Furthermore, Year 6 students are more active on social media (23%) compared to younger students, making them more likely to prioritize electronic devices over schoolwork. Similar patterns have been observed among teens and older students in other studies (Emily et al., 2022). It will be interesting to investigate whether students' prioritization of electronic devices over schoolwork has a negative effect on their academic performance, as suggested by previous studies. For instance, Lepp et al. (2015) found a negative correlation between phone usage and academic grades among students. Additional studies show similar trends among teenagers, where non-academic use of information technology negatively impacts academic performance. Interestingly, students in one such study also acknowledged this effect and correlation (Salomon & Ben-David Kolikant, 2021).

The overall findings of these studies indicate an age-dependent motivation for students' choice of phones and their usage, ranging from schoolwork to playing games and engaging with social media. While this is a small-scale study, the findings highlight the need for long-term research to explore other aspects, such as the impact of electronic device usage on students' academics and overall well-being.

It is important to note that this study has certain limitations that should be considered. The findings are based on data from a single school, and it would be valuable to explore whether similar patterns emerge in other Swedish schools. Moreover, the role of socioeconomic background in influencing students' choices needed further exploration. In addition, potential response biases among the student body—especially given that this is an international school with students from diverse nationalities—should also be taken into account while interpreting the outcome. A future direction could be to



explore the possibility of expanding the study to include teenagers, in order to better understand how age influences smartphone preferences and usage decisions. The insights of this study can also be further explored across different age ranges or in diverse learning environments—such as countries other than Sweden—using alternative approaches and including more qualitative data collection methods.

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## Mentor Contribution Statement

The mentor played an integral role in the development of the project. He was involved in designing the survey and provided constructive feedback on the version created by the students, enhancing its clarity and suitability for all year levels. He also supported the coordination of the survey schedule, ensuring it could be administered across all year groups. Furthermore, he contributed to the organization of the collected data and the creation of the initial figures, which he later refined in response to feedback from co-authors. His contributions were particularly significant in drafting and revising the manuscript based on input from other authors.

## Author Biographies

**Omisha Agnihotri Kumar** is a 13-year-old student in Year 8 at IES Johanneberg, Sweden. She has a deep fascination with science and technology and aspires to excel in the field of biomedicine through higher education. In 2024, Omisha participated in the Chalmers Future Classroom of 2050 technology competition, where she won first prize in the innovation category for her project, “Emotional Classroom.” With a bright outlook on her future, she eagerly looks forward to the scientific research that lies ahead.

**Riya Ghosh** is a 14-year-old student at IES Johanneberg in Gothenburg with a strong interest in both science and technology. From a very young age, she was fascinated by space and the universe, particularly the idea of life beyond Earth. Over time, her curiosity shifted toward biology and the human body. She became deeply interested in how the body functions and was inspired by how science can be used to improve people's health. Her goal is to pursue a biology-focused education in gymnasium and eventually become a surgeon or dermatologist.

Curious about how technology and digital tools affect daily life, Riya and three of her classmates conducted a survey as part of a research project. The survey focused on how students and teachers at IES Krokslätt, in year groups 3 to 6, use technological devices such as mobile phones in their day-to-day lives. The results revealed patterns in how students and staff interact with technology—ranging from device models, appearance, and brand preferences to functions—and how mobile phone usage changes with age. It also showed that many use their devices not only for entertainment and communication but also for learning and educational purposes.

Through this project, Riya developed valuable skills in research, data analysis, and communication. It also gave her the opportunity to reflect on how science and technology shape the way we live, learn, and connect. She enjoys exploring how these fields influence our surroundings and looks forward to continuing her studies in both areas.

**Laial Almawed** is a motivated middle school student with a strong interest in technology, science, and user-centered design. She previously studied Technology at the IES International English School in Sweden, where she explored how digital tools impact everyday life, learning, and communication among students.

Early on, Laial began participating in school-level science competitions, using these opportunities to apply theoretical knowledge to real-world questions. One of her key areas of focus has been the intersection of user behavior and electronic device design.



As part of a collaborative school project, Laial led a research survey analyzing how students use digital devices such as phones, tablets, and laptops. The study examined daily usage patterns, digital habits, aesthetic preferences, and the core functions valued by students. She worked with classmates to interpret the data and present findings on how technology influences student lifestyles and learning behaviors.

Beyond academics, Laial embraces a multicultural learning environment through her studies at an international English-language school, gaining valuable experience working across diverse educational contexts. These experiences have shaped her interest in how technology can be adapted to meet the needs of users from different backgrounds.

Looking ahead, Laial is focused on deepening her technical skills and continuing to explore how data and design thinking can shape the future of digital tools and their role in everyday life.

**Meral Ecem Bilgiç** is a 14-year-old student at the International English School in Gothenburg (IES Johanneberg). She was born and raised in Turkey and moved to Sweden with her family at the age of eight, excited for a fresh start.

Her interest in science began at an early age—whether it was dreaming of becoming an astronaut or diving into research about DNA. In sixth grade, she had the opportunity to conduct research with her classmates. Together, they created a survey to collect data on students' use of electronic devices, which they later transformed into a narrative report. Meral was thrilled when their work was accepted for publication by the *Convergence Journal*.

Beyond science, Meral is passionate about many other things as well. She has been playing the violin for nearly seven years and dreams of continuing professionally. She also enjoys reading, a hobby she has loved since elementary school, and considers it a form of self-care—an escape into the fascinating world of books and imagination. Recently, she has developed a strong interest in debating and hopes to start a debate group at her school as a way to connect with others who share similar interests.

**Manish Rauthan** has been teaching Teknik (Technology) to students aged 12–14 for the past six years and has also taught science to this age group for several years. He is passionate about helping students understand the basic scientific principles and technological concepts they encounter in their daily lives. His goal is to spark curiosity and engagement by connecting classroom learning to real-world experiences.

To achieve this, Manish encourages students to work on projects rooted in everyday life, allowing them to explore how technology plays an active role in their routines. The project featured in this study was developed collaboratively with students, based on the idea that smart devices have become an integral part of modern teenage life and significantly influence their day-to-day activities. The students were highly motivated and took ownership of planning and executing the entire study.

Manish's aim with this project was to guide students through the process of transforming an idea into a structured study and to help them understand how scientific findings are presented and published. For him, it is essential to inspire the next generation to take interest in science and technology, as they are the future leaders of research and innovation.

