Evaluating Secondary School Student's Distinct Preferences for Smartphones and its use

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The author is a Year 6 teacher for Science and Technology subjects.

Abstract

This study explored the factors influencing students' decisions regarding phone ownership, device selection, and general usage. It aimed to better understand the reasons behind students' choices and their use of phones and other electronic devices, particularly computers, across different year levels (3–6), involving ages ranging from 9 to 12 years.

The research was conducted using a Google survey that included multiple-choice questions with pictures for visual support and short-answer questions, allowing students to provide more detailed responses. The collected data was analyzed, and graphs were created to illustrate patterns and trends.

The results revealed that phone ownership and the ability to decide on the type of phone increased with age. Additionally, the data showed a clear gender-based bias in phone color preferences, with boys and girls demonstrating distinct choices. There was also a notable difference in the preference for iPhones versus Android devices. Furthermore, the findings highlighted variations in the use of electronic devices, especially phones and computers, among students of different age groups.

This study sheds light on preference patterns among younger students in Swedish schools and their alignment with findings from other regions worldwide. These findings serve as a foundation for future research, particularly on the effects of phone usage on students' personal and academic well-being.

Keywords: Student, Iphone, Android, Preference, smartphone, School, Sweden

Introduction

Today, students 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) to educational purposes (e.g., schoolwork) to entertainment (e.g., video games, social media, and videos) (Özkul, 2022). In this study, we aimed to investigate the reasons why students in our school choose smartphones and their most common purposes for using electronic devices such as smartphones and computers. We were also interested in identifying patterns in preferences and usage of these devices across different age groups. Our research was divided into two main parts: the first focused on smartphone use and selection criteria, and the second explored the general use of electronic devices, specifically computers and smartphones.

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.

Methods

This research study explores changes in the perception and preference of smartphone devices among students aged 9 to 12 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.

Design of survey

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 (433 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 like android or iphone
- Students phone preference, the reasoning and its usage.

Table 1 shows the list of questions that are 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	Multiple choice

one you currently have?/ Vilken mobil skulle du hellre ha en den som du har just nu?	
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

Participent Selection

The subjects (students) were selected randomly and had the freedom to choose whether to participate in this survey. A total of 433 students from Year Level 3 to 6 (ages 10-13) 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.

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.

Implementation in the analysis of data material

Once the data was 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 analysing 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.

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.

Results

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).

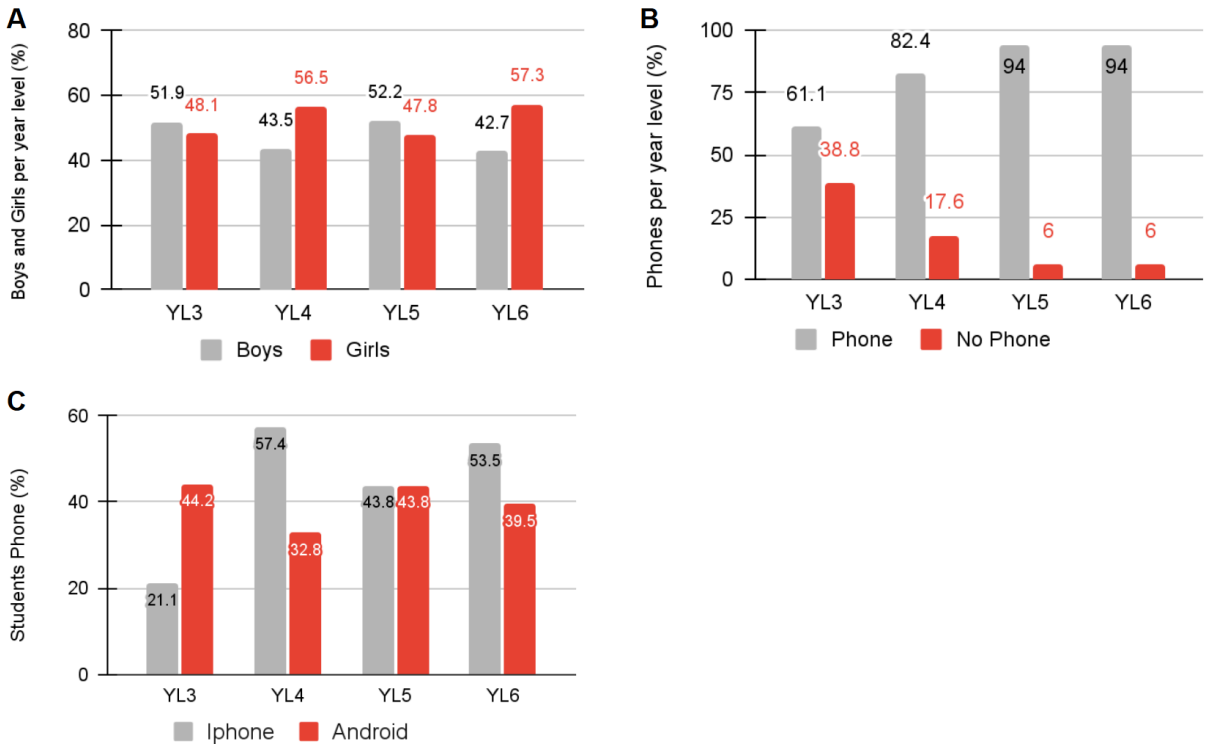

Figure 1: Panel A displays the percentage of female and male students across different year levels (YL3 to YL6), with the total number of students surveyed per year level provided as follows: YL3: 108, YL4: 108, YL5: 67, YL6: 150. Panel B illustrates the percentage of students who own phones in each year level. Panel C represents the distribution of students owning Android or iPhone devices.

In Figure 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.

Analysis of student phone trends: motivations, preferences, and colours 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).

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 phone 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).

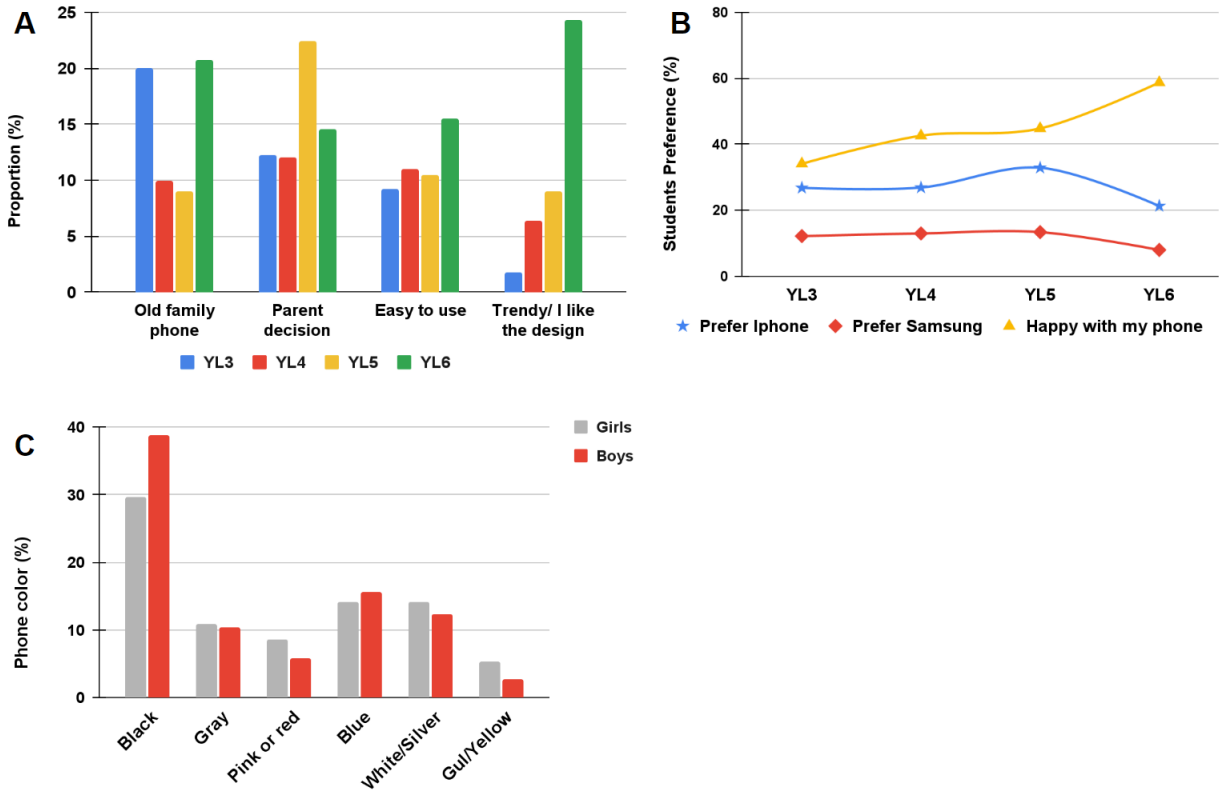

Figure 2: Panel A depicts the percentage of student's reasons for owning phones. Panel B illustrates students' phone type preferences as percentages, representing desired rather than currently owned models. Lastly, Panel C displays the predominant phone colors among boys and girls across various year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

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 is an aesthetic bias, such as the selection of phone color, among male and female 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 and gold phone colors (Fig 2c).

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).

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).

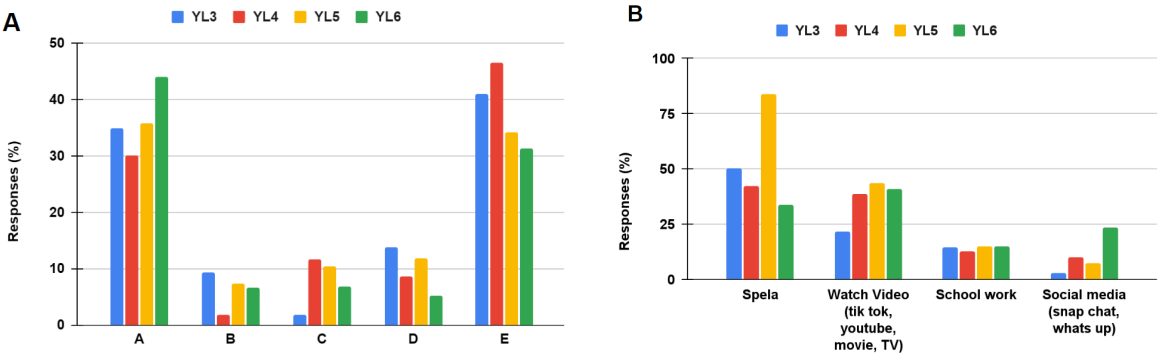

Figure 3: Panel A displays the percentages of students spending the majority of their time on electronic devices or school work, categorised into different groups: A: Spend more time on electronics; B: Do not focus on either electronics or school work; C: Focus equally on both; D: Focus on activities 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.

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).

Discussion

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

Phone Ownership Trends

The results show a clear correlation between student age and phone ownership, with ownership increasing significantly from Year Level 3 (61%) to 82.4% in Year Level 4, and reaching 94% among Year Level 6 students. These findings align with the observation 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.

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.

Gender Differences in Aesthetic Preferences

The study found a gender difference in phone color preferences, with boys tending to prefer black phones, while girls showed a stronger inclination toward red, pink, and gold. 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).

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).

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 additional aspects, such as the impact of electronic device usage on students' academics and overall well-being.

Furthermore, these findings provide valuable insights into the trends and preferences of students when choosing or using phones and other electronic devices, as well as how age influences these decisions.

Acknowledgement

We would like to thank Internationella Engelska Skolan for providing the resource, the school principal for providing the permission, feedback and financial support to conduct this study and the school Academic Manager to give feedback on the manuscripts and help with designing the survey.

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Peer Review Report
Title: *Evaluating Secondary School Students' Distinct Preferences for Smartphones and Its Use*
Recommendation: *Minor Revisions*

General Evaluation

This is an engaging and thoughtfully designed study that explores how children between the ages of 9 and 12 in a Swedish primary school make decisions about smartphones—both in terms of ownership and use. The study examines patterns in device preference, brand loyalty, color choice, and the nature of digital engagement among students across four year levels. What makes this project particularly noteworthy is not only its sizable sample (433 students), but the fact that it was led and co-authored by students themselves, under the guidance of a teacher.

The work is highly commendable for a journal that seeks to elevate youth voices in academic discourse. The paper's relevance to broader conversations around children's digital lives, social behavior, and educational environments makes it an excellent fit for *Convergence*. It shows clear evidence of rigorous planning, effective data collection, and a genuine curiosity about how young people interact with digital technologies in their everyday lives.

Areas for Improvement

Although the paper is overall strong, there are a few areas where revisions would improve its clarity and academic rigor.

1. **Title and Abstract**
   The current title is slightly awkward in its phrasing. A clearer and more standard academic title might be: *"Smartphone Ownership and Use Among Primary School Students in Sweden: A Student-Led Survey"*. The abstract is comprehensive but could benefit from slightly more concise language and stronger topic sentences. Refining it will help capture the reader's attention more effectively.
2. **Ethics and Consent**
   While the manuscript states that ethical guidelines were followed and that students participated voluntarily, it would be important to clarify whether parental or guardian consent was obtained for this research, particularly given the age of the participants. This would strengthen the paper's compliance with ethical research standards for minors.
3. **Interpretation and Thematic Depth**
   The findings are well presented, but the discussion would benefit from deeper reflection on *why* certain trends may be occurring. For example, when older students prefer iPhones over Androids, is this linked to brand image, peer influence, or perceptions of quality? When students spend more time on social media, how might this affect their relationships or schoolwork? Even raising such questions—without necessarily answering them definitively—would elevate the paper's analytical strength.
4. **Limitations**
   Including a brief paragraph that acknowledges the study's limitations (e.g., limited to one school, potential response bias, or the influence of socioeconomic background) would

show a more mature understanding of research design. This is a standard practice in academic papers and would strengthen the authors' credibility.

5. **Language and Grammar**
   There are a few areas where grammar and syntax could be improved. These are generally minor and do not detract from comprehension, but they should be cleaned up for publication. For instance, “smartphone and its use” could be revised to “smartphones and their use,” and “aesthetic bias” might be more clearly described as “color preferences influenced by gender norms.”

In summary, this paper is an excellent example of what youth-led research can achieve. It is methodologically sound, clearly written, and makes a meaningful contribution to ongoing discussions around childhood technology use and digital behavior. With a few modest revisions—primarily focused on improving clarity, addressing ethics more explicitly, and strengthening the interpretative sections—I believe this paper would be a strong and valuable addition to *Convergence.*

Review of "Evaluating Secondary School Student's Distinct Preferences for Smartphones and its use"

Summary

This paper investigates smartphone preferences and usage patterns among Swedish secondary school students aged 9-12 years across Year Levels 3-6. Through a well-designed Google survey with 433 participants, the authors analyze several important aspects of youth technology engagement: phone ownership rates, device preferences between iPhone and Android platforms, color preferences, motivations behind phone selection, and overall electronic device usage patterns. The study reveals compelling age-dependent trends in smartphone ownership that increase substantially as students age, distinct gender-based color preferences, and notable shifts in how students allocate time between electronics and schoolwork as they advance through grade levels.

Strengths

The research addresses a highly relevant topic given the pervasiveness of smartphone usage among increasingly younger students. According to the UK government reports cited in the paper, 99% of children spend time online, and an alarming 9 out of 10 children own a smartphone before they reach 11 years of age. The Swedish context adds valuable geographic diversity to this research area.

The methodology demonstrates thoughtful consideration of the target population's needs. The survey design is appropriately age-accessible, incorporating visual aids and offering bilingual options in both English and Swedish to ensure comprehensive student comprehension. I particularly appreciate the balance between quantitative (multiple-choice) and qualitative questions, which creates a more nuanced understanding of student preferences and behaviors.

The sample size represents another significant strength. With 433 student participants distributed across four year levels, the authors have collected sufficient data to make meaningful comparisons between different age groups. This robust sample enhances the credibility of the observed patterns, particularly regarding the age-dependent changes in ownership rates and usage behaviors.

The data visualization throughout the paper deserves special commendation. The figures effectively illustrate key findings, with clear and accessible presentation of differences across year levels and gender categories. The graphical representations make complex data patterns immediately apparent to readers, enhancing the paper's overall impact and accessibility.

I was also impressed by the authors' careful attention to research ethics. They demonstrate appropriate consideration for informed consent and data privacy, which is especially important when working with younger research participants. This ethical foundation strengthens the overall integrity of the study.

In the discussion section, the authors successfully connect their findings to relevant literature, contextualizing their results within the broader research landscape on youth technology use. These connections demonstrate scholarly awareness and help situate the current study's contribution within existing knowledge. The parallels drawn between their findings and those from previous studies lend additional validity to their observations.

Suggestions for Improvement

The paper would benefit substantially from more rigorous statistical analysis to the extent the authors can. Throughout the results section, numerical differences between groups are described but not tested for statistical significance. Without such testing, it remains unclear whether observed patterns represent genuine population differences or merely sampling variations. Incorporating appropriate statistical tests (such as chi-square tests for categorical comparisons) would add considerable scientific weight to the findings.

The introduction establishes the general topic area effectively, but the paper lacks explicitly stated research questions or hypotheses. Formulating specific research questions would provide clearer direction for both the analysis and discussion sections. These questions would help readers understand precisely what gaps in knowledge the study aims to address and would create a stronger conceptual framework for interpreting the results.

Although the introduction provides relevant background information, a more structured literature review section would better establish the theoretical foundation for this work. An expanded review would more thoroughly identify existing knowledge gaps and more explicitly articulate how this study contributes to addressing those gaps. This context would enhance readers' understanding of the study's significance within the broader research landscape.

The methodology section would be strengthened by additional information about several key aspects of the research process. More details about survey distribution methods, overall response rates, and potential sampling biases would provide greater transparency about the study's implementation. This information helps readers evaluate the generalizability of the findings and potential limitations in the sampling approach.

The discussion mentions the need for "long-term research" but could provide more specific recommendations for future work. Articulating clear directions for subsequent studies would enhance the paper's contribution to advancing research in this area. This might include suggestions for longitudinal designs, mixed-methods approaches, or specific questions requiring further investigation.

Finally, addressing some grammatical inconsistencies and formatting issues would improve the overall presentation. There are occasional awkward phrasings and subject-verb agreement errors that could be remedied through careful proofreading.

Thank you for your feedforward comments and for identifying the key aspects of the study that required attention and development. Your suggestions were invaluable in helping us make the manuscript more concise, focused, reliable, and relevant to the field.

Please note: In the response below, all changes made within the manuscript are presented in *italics* for clarity and ease of identification.

Areas for Improvement

Although the paper is overall strong, there are a few areas where revisions would improve its clarity and academic rigor.

1. Title and Abstract

The current title is slightly awkward in its phrasing. A clearer and more standard academic title might be: *"Smartphone Ownership and Use Among Primary School Students in Sweden: A Student-Led Survey*". The abstract is comprehensive but could benefit from slightly more concise language and stronger topic sentences. Refining it will help capture the reader's attention more effectively.

Author reply: We have changed the title of the paper as suggested by the reviewer. The abstract has been edited to make it more concise while highlighting the key aspects of the study.

2. Ethics and Consent

While the manuscript states that ethical guidelines were followed and that students participated voluntarily, it would be important to clarify whether parental or guardian consent was obtained for this research, particularly given the age of the participants. This would strengthen the paper's compliance with ethical research standards for minors.

Author reply: Individual Consent was not obtained, as the survey was conducted anonymously within a school environment. The following statement has been added

to the “Implementation section under Analysis of Data Material” section, to make it clear that ethical guidelines have been followed.

“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.”

3. Interpretation and Thematic Depth

The findings are well presented, but the discussion would benefit from deeper reflection on why certain trends may be occurring. For example, when older students prefer iPhones over Androids, is this linked to brand image, peer influence, or perceptions of quality? When students spend more time on social media, how might this affect their relationships or schoolwork? Even raising such questions—without necessarily answering them definitely—would elevate the paper’s analytical strength.

Author reply: We have added a section in discussion about switch of phone preference and possible reason behind it.

“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.”

We have added a section in discussion about phone usage and its effect on academic performance.

It will be interesting to investigate in future research 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).

4. Limitations

Including a brief paragraph that acknowledges the study's limitations (e.g., limited to one school, potential response bias, or the influence of socioeconomic background) would show a more mature understanding of research design. This is a standard practice in academic papers and would strengthen the authors' credibility.

Author reply: We have added a section in discussion about switch of phone preference and possible reason behind it.

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. Additionally, 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.

5. Language and Grammar

There are a few areas where grammar and syntax could be improved. These are generally minor and do not detract from comprehension, but they should be cleaned up for publication. For instance, "smartphone and its use" could be revised to "smartphones and their use," and "aesthetic bias" might be more clearly described as "color preferences influenced by gender norms."

Author reply: The authors have revised the language and syntax as suggested by the reviewer. Additionally, the text has been made more reader-friendly by clearly explaining terms such as *aesthetic bias*.

Thank you for your feedforward comments and for identifying the key aspects of the study that required attention and development. Your suggestions were invaluable in helping us make the manuscript more concise, focused, reliable, and relevant to the field.

Please note: In the response below, all changes made within the manuscript are presented in *italics* for clarity and ease of identification.

Suggestions for Improvement

Reviewer comments: The paper would benefit substantially from more rigorous statistical analysis to the extent the authors can. Throughout the results section, numerical differences between groups are described but not tested for statistical significance. Without such testing, it remains unclear whether observed patterns represent genuine population differences or merely sampling variations. Incorporating appropriate statistical tests (such as chi-square tests for categorical comparisons) would add considerable scientific weight to the findings.

Author reply: The author has performed chi-square tests on the data presented in Figures 2a, 3a, and 3b to determine whether the observed differences are statistically significant. The corresponding text in the manuscript has been updated accordingly.

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.*

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).*

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.*

Reviewer comments: The introduction establishes the general topic area effectively, but the paper lacks explicitly stated research questions or hypotheses. Formulating specific research questions would provide clearer direction for both the analysis and discussion sections. These questions would help readers understand precisely what gaps in knowledge the study aims to address and would create a stronger conceptual framework for interpreting the results. Although the introduction provides relevant background information, a more structured literature review section would better establish the theoretical foundation for this work. An expanded review would more thoroughly identify existing knowledge gaps and more explicitly articulate how this study contributes to addressing those gaps. This context would enhance readers' understanding of the study's significance within the broader research landscape.

Author reply: The author has rewritten a section of the introduction to clarify the purpose of the study and highlight its significance in relation to previous research.

There are various reasons behind smartphone exposure among children aged 9-12, ranging from necessity (e.g., contacting parents and friends) to educational purposes (e.g., schoolwork) to 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, including 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.

Reviewer comments: The methodology section would be strengthened by additional information about several key aspects of the research process. More details about **survey distribution methods**, **overall response rates**, and **potential sampling biases** would provide greater transparency about the study's implementation. This information helps readers evaluate the generalizability of the findings and potential limitations in the sampling approach.

Author reply: Based on the reviews comments, a text has been added to explain the overall response rate for the survey in Implementation in the analysis of data material section.

“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 data analyses. The remaining 22 responses were incomplete and therefore excluded from any analysis. ”

Based on the above information, the authors have updated the main text to clarify for readers that the total number of survey participants is 411 instead of 433, and that the total number of YL6 students who took part is 128.

Additionally, the text is added in the Participant Selection section to explain the concern related to sampling bias.

“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.”

In addition, the author has already explained the survey distribution methods in Implementation in the collection of data material section.

Reviewer comments: The discussion mentions the need for "long-term research" but could provide more specific recommendations for future work. Articulating clear directions for subsequent studies would enhance the paper's contribution to advancing research in this area. This might include suggestions for longitudinal designs, mixed-methods approaches, or specific questions requiring further investigation.

Author reply: The final part of the discussion section has been rewritten to incorporate the study's limitations and suggest directions for future research.

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 additional 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. Additionally, 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. Additionally the insights of this study can be further explored across different age ranges or in diverse learning environments—such as countries

other than Sweden—using alternative approaches, including more qualitative data collection methods.

Reviewer comments: Finally, addressing some grammatical inconsistencies and formatting issues would improve the overall presentation. There are occasional awkward phrasings and subject-verb agreement errors that could be remedied through careful proofreading.

Author reply: Proofreading of the manuscript was carried out by a native English speaker to check for grammar and sentence structure.

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

[names redacted by managing editor]

[school redacted by managing editor]

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*Author with equal contribution. These authors are 12-13 years old and in Year level 6 at

[school redacted by managing editor]

#The author is a Year 6 teacher for the subjects Science and Technology.

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.

Keywords: Student, Iphone, Android, Preference, Smartphone, School, Sweden

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.

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.

Design of survey

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.
- Students phone preference, the reasoning, and its usage.

Table 1 shows the list of questions that are 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

Participent 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.

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.

Implementation in the analysis of data material

Once the data was 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 analysing 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.

Results

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).

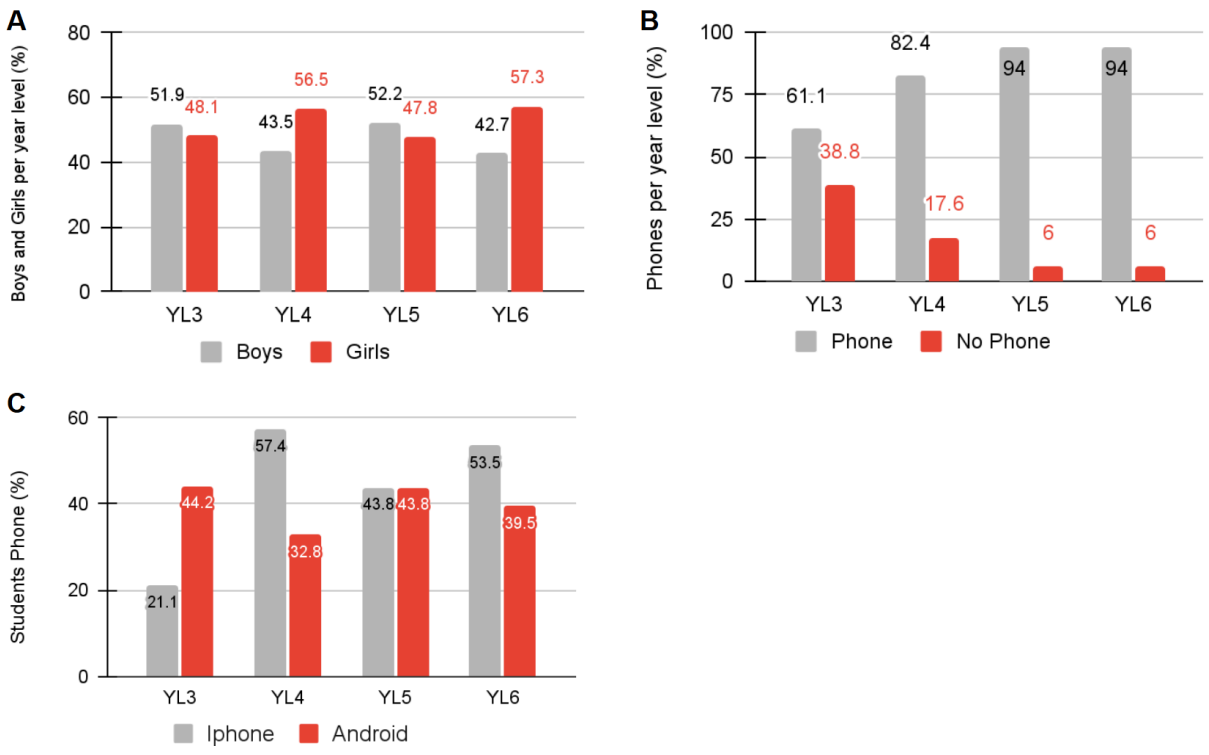

Figure 1: Panel A displays the percentage of female and male students across different year levels (YL3 to YL6), with the total number of students surveyed per year level provided as follows: YL3: 108, YL4: 108, YL5: 67, YL6: 128. Panel B illustrates the percentage of students who own phones in each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

In Figure 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.

Analysis of student phone trends: motivations, preferences, and colours 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).

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.

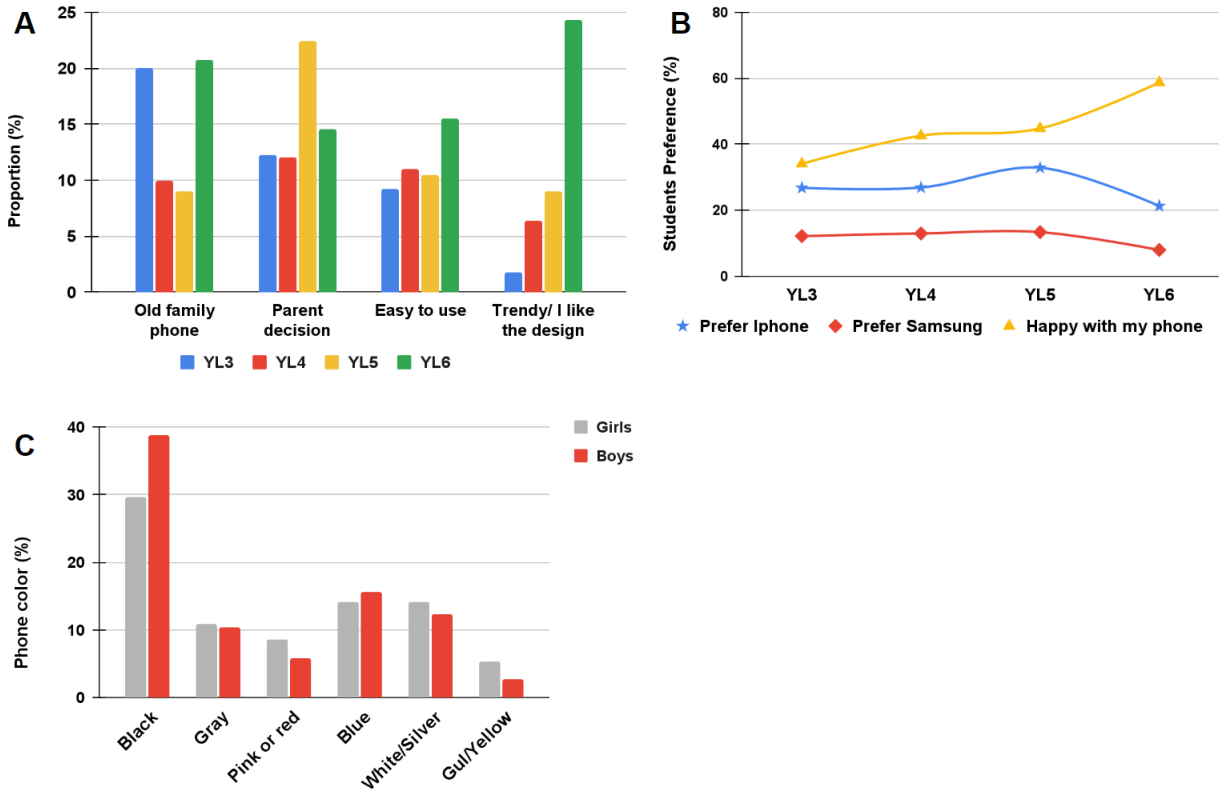

Figure 2: Panel A depicts the percentage of student's reasons for owning phones. Panel B illustrates students' phone type preferences as percentages, representing desired rather than currently owned models. Lastly, Panel C displays the predominant phone colors among boys and girls across various year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

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).

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).

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).

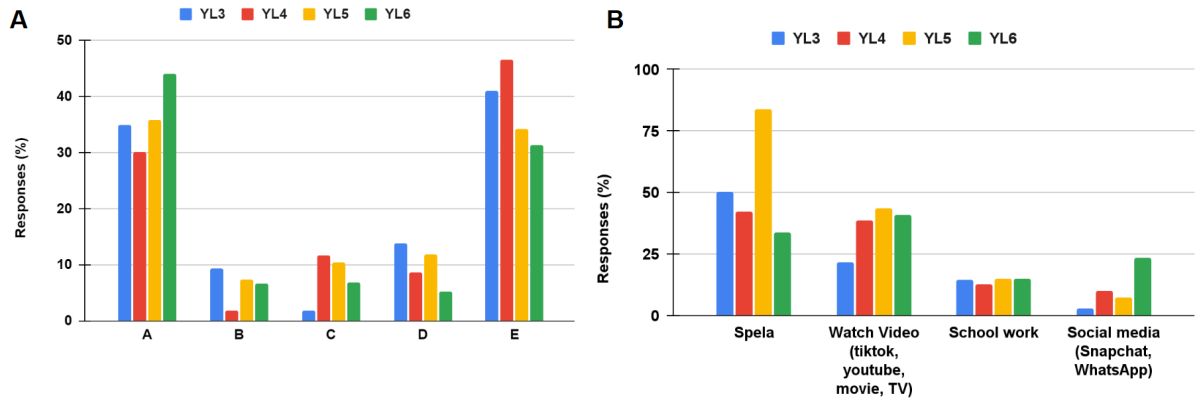

Figure 3: Panel A displays the percentages of students spending the majority of their time on electronic devices or school work, categorised into different groups: A: Spend more time on electronics; B: Do not focus on either electronics or school work; C: Focus equally on both; D: Focus on activities 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.

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.

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.

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.

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.

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).

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.

Acknowledgement

We would like to thank Internationella Engelska Skolan for providing the resources, the school principal for providing the permission, feedback and financial support to conduct this study. We would like to thank the school Academic Manager and Head of English for giving feedback on the manuscripts, helping with designing the survey and proofreading the manuscript.

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