

## **Exploring Percentages of Elementary School Students Utilizing Visual Electronic Devices for Learning and Homework Assistance**

Prepared by

**Dr. Magdee Abdelnabi Helal<sup>1</sup>**

### **Abstract**

This research paper aims to determine both the percentage of elementary school students who utilize visual electronic devices (such as desktops, tablets, smartphones and televisions) for learning purposes and their percentage in utilizing these devices for homework assistance. A descriptive approach was employed with data collected through a structured questionnaire administered to a sample of 170 fifth-grade students. These students were randomly selected from schools in Giza Governorate during the 2024/2025 academic year. The findings revealed that a high percentage of students use visual electronic devices for learning purposes, with smartphones being the most frequently used device, reported by 85% of students. Television is the second most commonly used device for learning, with 64% of students relying on it, followed by tablets at 62%, and desktops as the least preferred, used by 56% of students. Additionally, a moderate to high percentage of students use these devices for homework assistance. Among these, smartphones are the most widely used, with 71% of students relying on them for homework, followed by tablets used by 52% of students. Televisions rank third, used by 45% of students, and desktops are the least utilized for homework support, used by 42% of students.

**Keywords: Percentage, Visual Electronic Devices, Homework, Elementary School Students**

### **Introduction**

Throughout history, people have aspired to glimpse distant events and gather information as if peering into a crystal ball. This long-standing dream has nearly become reality through the discovery of electricity and subsequent scientific innovations. Beginning with the telegraph and telephone, followed by radio, television, computers, and mobile phones, these advancements have created electronic devices that serve as our modern-day crystal balls, bringing distant sights and sounds within reach.

Electronic devices, encompassing both interactive and non-interactive tools, have revolutionized communication and computing, significantly shaping the modern world. One of the most significant benefits of these inventions is their impact on education, as they facilitate the development of learning by overcoming time and space constraints. Learners are

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<sup>1</sup> Research Professor in the Educational Activities and Talent Nurture Research Division at the National Center for Educational Research and Development, Cairo. E-mail: magdee.helal@yahoo.com

able to access education at any time and from any location, according to their individual learning capacities. These inventions not only assist students in acquiring knowledge but also support them in completing homework and assignments through various online platforms dedicated to educational support.

In this context, numerous studies have been conducted to examine the benefits of using electronic devices for learning and homework assistance. For instance, Aduwa-Ogiegbaen and Iyamu (2005) conducted a study aimed at investigating the impact of computer-assisted learning (CAL) on students' academic achievement in Nigeria. The findings of their study suggest that computer-assisted learning can be a valuable tool for enhancing students' academic performance in the Nigerian context.

Additionally, Beschorner and Hutchison (2013) conducted a study to examine the impact of tablet use on learning. The results highlighted several potential benefits, including increased student engagement, personalized learning experiences, and access to digital resources. Similarly, Ezenwafor et al., (2020) carried out research to investigate the effect of computer-assisted instruction (CAI) on students' academic achievement and interest in auto-mechanics technology in technical colleges. Their findings revealed that CAI positively influences students' academic performance and stimulates interest in the subject of auto-mechanics. It was found to be more engaging, effective, rewarding, and valuable in the teaching of auto-mechanics at technical colleges.

Herodotou and Christothea (2017) also conducted a study aimed at reviewing research that addresses the effects of tablets on young children's learning and development. Their findings indicated that the majority of studies reported positive effects of tablet use on literacy development, mathematics, science, problem-solving skills, and self-efficacy.

Furthermore, Ibragimov et al., (2023) conducted a study aimed at assessing the effectiveness of smartphones in education through a meta-analysis of recent research. The findings revealed that smartphones have a significant positive effect, as evidenced by the studies reviewed.

In the same vein, Khan and Paracha (2019) conducted research aimed at investigating the effects of educational television programs on children's academic performance. The findings revealed that watching educational programs during childhood enhances academic performance and positively impacts learning behaviour, cognitive development, socialization skills, as well as emotional and intellectual growth.

Considering that the percentage of electronic device usage indicates students' awareness of these technologies, the research team noted a scarcity of studies conducted on this topic. One such study is by Duran and Aytac (2016), which aimed to determine students' views on the use of tablet computers in learning and teaching processes. The findings indicated that a moderate percentage of the research sample preferred using tablet computers for learning, while a low percentage reported difficulties in using tablets in the classroom.

Ahmad (2020) also conducted a study aimed at examining students' perceptions, views, and opinions regarding the use of mobile phones in an educational setting at a higher education institution in Jamaica. The study results indicated that 79% of the research sample utilized cell phones to seek assistance from teachers, 84% used them to collaborate with peers on class projects, and 69% employed cell phones to obtain peer tutoring.

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Furthermore, Gay et al., (2006) conducted a study to examine the attitudes and usage of information and communication technology (ICT) among undergraduate management students in Barbados. The findings indicated that students were more inclined to use computers for typing assignments (90%) and for engaging in distance education from home (68%).

Accordingly, the findings of these studies could assist education policymakers in adopting the most effective approaches for integrating visual electronic devices into the learning process.

### **Research problem**

Based on the previously mentioned studies that highlight the importance and extent of using visual electronic devices in education, particularly for learning and homework assistance, It has become evident that devices such as desktops, tablets, televisions, and smartphones play a significant role in supporting students' academic performance.

Despite fifth-grade elementary students' awareness of how to use these devices both in school and at home (Helal et al., 2024), and the inclusion of similar students as samples in previous studies in the same field (Mendicino et al., 2009), the research team could not identify any prior studies conducted in Egypt that explore the percentage of visual electronic device usage among elementary school students.

Based on this context, the research problem can be defined through the following questions:

1. What percentage of elementary school students utilize:
  - a. Desktops
  - b. Tablets
  - c. Smartphones
  - d. Televisionsas visual electronic devices for learning?
2. What percentage of elementary school students utilize:
  - a. Desktops
  - b. Tablets
  - c. Smartphones
  - d. Televisionsas visual electronic devices for homework assistance?

### **Research Objectives:**

Based on the research questions, the study objectives are as follows:

- To determine the percentage of elementary school students who utilize visual electronic devices for learning.
- To determine the percentage of elementary school students who utilize visual electronic devices for homework assistance.

### **Research Methodology**

#### **Design**

The research team approved a descriptive approach for this study, as it is suitable for achieving its objectives.

**Sample**

The research sample consisted of 170 fifth-grade students, comprising 88 boys and 82 girls, with an average age of approximately 11 years. These students were randomly selected from fifth-grade classes in schools located in Giza Governorate during the 2024/2025 academic year.

**Data Collection Tool**

The research team utilized a questionnaire as the data collection tool. The preparation of the questionnaire involved the following steps:

1. Reviewing pertinent research and reports related to the topic to identify potential items for inclusion.
2. Developing the questionnaire items and formulating statements for each item based on the insights gained from the previous step.
3. Identifying the psychometric properties of the questionnaire, which was achieved through the following procedures:

**A. Assessment of questionnaire validity**

The validity of the questionnaire was established through content validity, which involved submitting it to a panel of professors who served as experts to evaluate the following aspects:

- Clarity of the questionnaire instructions.
- The extent to which the items in the questionnaire relate to the research objectives.
- The relevance of the statements of each item to the respective categories to which they belong.
- Clarity of the wording of items and statements, ensuring their suitability for the comprehension of fifth-grade primary school students.

The responses from the experts confirmed the content validity of the questionnaire, with consensus levels for items and statements ranging from 66% to 100%.

**B. Identification of Questionnaire Reliability**

The questionnaire was administered to a sample of 25 male and 25 female fifth-grade students from the research population. A statistical analysis of their responses using the Cronbach's alpha method indicated an alpha coefficient of 0.823, confirming the reliability of the questionnaire.

## Research Results

**Table (1) Percentages of elementary school students who utilize visual electronic devices for learning purposes (n=170)**

<b>The device</b>	<b>User number</b>	<b>%</b>	<b>Rank</b>
Desktop	96	56%	4
Tablet	106	62%	3
Cell phone	144	85%	1
Television	109	64%	2

The results presented in Table (1) indicate that the cell phones are the most commonly used electronic devices for learning, with 144 students utilizing them, representing 85% of the total respondents for this item. Television is the second most commonly used device, employed by 109 students (64%), followed by tablets with 106 students using them (62%). The least commonly used device is the desktop computer utilized by 96 students, accounting for 56% of the total responses for this item.

**Table (2) Percentages of elementary school students who utilise visual electronic devices for homework assistance**

<b>The device</b>	<b>User number</b>	<b>%</b>	<b>Rank</b>
Desktop	71	42%	4
Tablet	88	52%	2
Cell phone	120	71%	1
Television	77	45%	3

The results presented in Table (2) indicate that cell phones are the most commonly used electronic devices for homework assistance, with 120 students (71% of the total sample) using them. Tablets are the second most common, with 88 users (52%), followed by television with 77 users (45%). The least utilized device is the desktop computer, with 71 users, representing 42% of respondents.

## Discussion of Results

According to the findings in Table (1), which show that cell phones ranked first among the listed devices, the research team attributes this result to data from the Ministry of Communications and Information Technology in Egypt. This data indicates that the mobile phone penetration rate reached 96.95% by the end of the period from January to March 2023,

(2), reflecting the widespread usage of mobile phones in Egypt. This prevalence may be due to the small, portable size of mobile phones, which facilitates their use both inside and outside the classroom. Furthermore, students find smartphones easy to operate, as they do not require advanced computer literacy skills.

This result is consistent with those of the study by Darko-Adjei (2019) which showed that the majority of the sample used smartphones for learning activities. It also aligns with the findings of Ifeanyi and Chukwuere (2018) which reported that most undergraduate students believed smartphones support their academic activities.

Referring back to Table (1), television ranks second in usage, which may be attributed to its widespread presence in nearly all households. As a 'family device', television does not incur additional charges for use, unlike other devices listed in the table that require a paid internet connection to access information. This makes television a suitable option for students, particularly those from low-income families. However, it is important to note that this advantage comes at the cost of the interactive features offered by the other devices in the table.

The relatively high percentage of students using television for learning may be explained by Salomon's (1984) finding that school-aged children and college students generally perceive learning from television as easier than learning from print. Additionally, this high usage of television for learning could be attributed to students finding educational television programs beneficial, as supported by the findings of Akhter (2011).

Furthermore, Table (1) shows that the tablet ranks third in usage. This ranking may be attributed to the tablet's numerous advantages, including its portability—second only to that of the cell phone—its internet connectivity, and its relatively low cost, which may make it more affordable than other devices listed in Table (1).

A closer examination of Table (1) reveals that the desktop computer ranks last among the devices. From the research team's perspective, this result is logical, as desktop computers are not portable like smartphones and tablets, do not have the widespread usage of televisions, and they are generally more expensive than the other devices listed.

However, it is important to acknowledge an alternative perspective, which suggests that while smartphones and tablets are ideal for internet browsing due to their flexibility and portability, desktop computers and laptops continue to excel in handling resource-intensive and complex computing tasks. (3)

In light of this perspective, the research team believes that learning in elementary school does not require intensive or complex computing tasks. Therefore, the financial factor is considered to be the most influential in determining the ranking of the desktop computer in Table 1.

When analyzing the results in Table 2, the research team observes a similar pattern to Table 1, except that the tablet ranks second while the television moves to third. This result appears logical, as the tablet's features enable students to interact with both peers and teachers

<sup>2</sup> <https://www.youm7.com/story/2022/3/20/أبرز-٧-مؤشرات-للاتصالات-في-مصر-١٠٣-ملايين-مستخدم-٥٦٩٧٥٢٧/محمول>

<sup>3</sup> <https://techreport.com/statistics/hardware-gadgets/mobile-vs-desktop-usage-statistics/>

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and provide access to a wide range of online resources. These advantages support students in completing their homework, a function that television does not facilitate.

The first-place ranking of the cell phone and the second-place ranking of the tablet in Table 2 can be explained in light of the findings by Michael Mendicino et al., (2009) which demonstrated that students learned significantly more with web-based homework than with traditional paper-and-pencil homework. This study revealed a statistically significant difference in favour of the web-based homework system, suggesting that students may prefer devices that enable internet connectivity.

Regarding the television's third-place ranking in Table 2, the research team attributes this to several factors: its widespread presence in most households, the availability of free educational programming, and the absence of a requirement for advanced technological skills. However, its limited interactivity and the constraints imposed by scheduled programming contribute to its lower ranking.<sup>(4)</sup>

The research team attributes the desktop computer's fourth place ranking in Table 2 to several factors. Although it shares similar functionalities with the cell phone and tablet, its lack of portability, immobility, and relatively higher cost likely contribute to its lower position in the rankings.

### Conclusion

**In light of the research findings and discussion, the research team concludes the following:**

1. A high percentage of students use the visual electronic devices mentioned in this study for learning purposes. The most commonly used device is the cell phone, utilized by 85% of students. This high usage rate can be attributed to its features, such as internet connectivity, ease of interaction, and portability. The second most preferred device is the television, with 64% of students utilizing it for learning purposes. This preference is likely due to its widespread presence in most households and the availability of free educational programming. The tablet ranks third, with 62% of students using it, while the desktop computer is the least preferred, used by 56% of students.
2. A moderate to high percentage of students use the electronic visual devices for homework assistance. The most commonly used device for this purpose is the cell phone, relied upon by 71% of students. This preference can be attributed to the same reasons as its use in learning, particularly its ability to provide internet access for finding references and resources. The tablet ranks second, used by 52% of students, benefiting from similar features as the cell phone. The television is the third most preferred device, used by 45% of students, for reasons similar to its use in learning. The least preferred device for homework assistance is the desktop computer, used by 42% of students, likely for the same reasons as its lower use in learning—its immobility and higher cost.

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<sup>4</sup> [https://cct.edc.org/sites/cct.edc.org/files/publications/lft\\_rr96.pdf](https://cct.edc.org/sites/cct.edc.org/files/publications/lft_rr96.pdf)

## **Research Recommendations**

**In light of the research findings, the research team recommends the following:**

- 1-** The need for implementing programs to enhance awareness among parents and educators regarding the value of internet-connected devices as educational tools.
- 2-** The necessity of increasing awareness among teachers and students of educational websites and applications that support learning and assist in homework completion.
- 3-** The need for offering professional development opportunities for teachers to effectively integrate internet-connected devices into both classroom instruction and home-based learning activities.
- 4-** The necessity of organizing workshops for students so as to emphasize the benefits of collaborative work and peer interaction to enrich their learning experiences.
- 5-** The need for developing informational resources to educate parents on programs aimed at preventing the misuse of electronic devices, with guidance on the importance of monitoring students' usage.



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