# The Relationship between Mobile Phone Usage and Academic Performance of Secondary School Students: A Case Study in Asian International School

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## ABSTRACT

Technology is a global imperative because of its contributions to human existence and has improved global socioeconomic relations. As a result, the mobile phone has become the most important mode of communication today. It is also an important learning tool for today's school students. It enables students to access online learning platforms, course resources, and interact digitally. The goal of this study was to determine the relationship between mobile phone usage and academic performance of secondary level students at an international school in Sri Lanka. The study's sample consisted of 523 Secondary level students from an International School, ranging from Form 1 to Upper 6. For the study, a survey research design and questionnaires were used. Google Forms was used to create the students' survey. The findings show that there is a positive relationship between mobile phone usage and academic performance among secondary school students, no relationship between mobile phone usage and academic performance among secondary school students of different parents' occupations, and a relationship between the frequency of mobile phone usage and academic performance among secondary school students.

**Key Words:** Mobile Phone, Academic performance, secondary level, International schools

## INTRODUCTION

Since their rapid rise in popularity in the late 1990s, mobile phones have become an almost indispensable part of people's daily lives. Today, the mobile phone has become the most important mode of communication. It has practically affected society's accessibility, security, safety, and coordination of business and social activities, and has thus become a part of global culture. There were 24 percent of teens go online "almost constantly," which is made possible by the widespread availability of smartphones. In relation to the mobile phone device, there is a conflicting priority among young people, parents, and teachers, with educators more concerned about issues such as classroom discipline and parents concerned about ways to contact their children at all times (Amanda et al, 2015). However, research on the relationship between mobile phone usage and academic performance of school students today has received little attention.

The problem's assertion Mobile phones are extremely common today, particularly in the hands of senior secondary school students who own some of the most expensive and sophisticated (smart) mobile phones, tablets, and iPads capable of connecting to the internet and all forms of social media platforms, other web sites, and so on. As a result, they can use their phones to communicate, access, upload, and download various types of media, play games, and take photographs. This is due to the benefits of mobile learning, such as the ability to share knowledge without regard for space or time, as well as the ability to facilitate the

development of critical thinking, participatory learning, problem solving, and lifelong communication skills (Abidin and Tho, 2018). Mobile phones, on the other hand, have a variety of applications that can help with teaching and learning, such as general presentation software, word processing, and spreadsheets. Online lessons can be accessed via a mobile phone. The mobility of mobile phone use distinguishes it from other learning technologies. Regardless of these benefits, it is the student's responsibility to use the phone properly and not abuse it. As a result, the purpose of this study was to investigate the relationship between student academic performance and mobile phone usage.

# LITERATURE REVIEW

A mobile phone is a portable telephone that can make and receive calls while the user is moving within a telephone service area using a radio frequency link. The first mobile phone was used in 1973, and technological advancements in the millennium revolutionized mobile phones. Text messaging, MMS (Multimedia Message Service), email, Internet access, short-range wireless communications (infrared, Bluetooth), business applications, video games, and digital photography are all supported by mobile phones from the 2000 s.

A smartphone is a mobile phone that can perform many of the functions of a computer, typically with a touch screen interface, Internet access, and an operating system that can run downloaded apps (Gordon.Gow, 2006). Technology is a global imperative because of its contributions to human existence and has improved global socioeconomic relations. Wireless communication has emerged as one of the world's fastest disseminating media, fueling the emergence of a "mobile youth culture." Teens are increasingly owning and using cell phones as they become more widely available. Furthermore, as handsets become more capable of performing tasks such as video recording, Furthermore, as handsets become more capable of video recording and sharing, music playback, and internet access, teens and young adults have an ever- expanding repertoire of uses. (Report of PEW Research Center, 2018).

According to Edgar Dale's model (See graph 1), people remember 50% of what they see and hear (1959). This category includes the use of smart phones for education today. Students can watch/listen to audio and video materials at their own pace in the classroom. On mobile phones, there are a plethora of simulation applications. According to the model, 90% of what students do can be recalled, so running simulations on mobile phones is also an excellent learning tool.

Learning management system (LMS) are being used for the administration, documentation, tracking, reporting, automation and delivery of educational courses, training programs, or learning and development programs. An LMS gives the ability to track the progress of learners in the course material. They help to track the learners' understanding of the material, measure their interaction with the content provided, see if it meets all of their needs, or be enhanced with some text, audio, and video files to enrich it.

Empirical Study of the Relationship between Education and Mobile Phones Based on previous research on phones and teens, the first studies to investigate the social consequences of the mobile phone were conducted in the early 1990s, when researchers investigated its impact on residential markets [Jarrat & Coates, 1990]. Adolescents appear to become extremely self-conscious and pay significant attention to what their peers think of them, so attachment to internet-enabled phones is an area of conflict and regulation that should be investigated. As a result, students are enthralled by current events and fashion trends found in social structures of societal settings. People may check their phones out of habit or compulsion, but doing so can be used to avoid interacting with others. When some people are without their smartphones, they may experience withdrawal symptoms similar to those associated with substance abuse, such as anxiety, insomnia, and depression, and all of this contributes to the academic relapse of students who fall into this category. Surprisingly, these addictions have a significant impact on students without their knowledge, and some of them find it difficult to believe that they are addicted to their phones. As a result, academics are

given more weight than the amount of time spent on these phones. Choliz, (2010) stated that excessive cell phone use and dependency may be classified as an addictive disorder.

Many researchers conducted in-depth studies on the factors that influence student performance at various levels of study. It is generally assumed that students who performed better or higher in their first classes of study performed better in subsequent academic years at the degree level. However, it has been observed that many of the researchers disagree with this point of view or statement. Talcott & Reddy, (2012) disagreed with these assumptions that future academic gains are determined by deteriorating performance. Students' academic achievement is also related to their parents' socioeconomic status, which includes their academic and professional qualifications, income, and occupational affiliation. Many studies have found that a student's academic achievement is influenced by his or her parents' socioeconomic status. As a result, students from higher socioeconomic backgrounds will perform better than students from lower socioeconomic backgrounds. "In general, students' social and economic status is determined by combining their parents' qualifications, occupation, and income standard" (Jeynes, 2002). Students from elite schools are expected to perform well because they attend these elite schools, which are typically very rich in resources and facilities. Some researchers believe that school ownership and the resources available in schools have an impact on student performance.

According to Crosnoe and Elder (2004), school ownership, provision of facilities, and availability of resources in school are important structural components of the school. Private schools outperform public schools due to better funding, smaller class sizes, serious ownership, motivated faculty, and access to resources such as computers.

Chen and Tzeng (2010) discovered that information seeking was associated with better academic performance among heavy Internet users, whereas video game playing was associated with lower levels of academic performance. Several recent studies have found a link between social networking site use (e.g., Facebook, My Space, Twitter) and poor academic performance.

In their study, Norries, Hossain, and Sloway (2011) demonstrated that when students use mobile learning devices, such as smartphones, during learning time, their achievement increases significantly. This is due to the fact that as they use the device, their time spent on task completion will increase. They also discovered that students were constantly using their smartphone cameras to photograph abstract concepts taught in class so that they could later relate them to concrete ideas. Similarly, Cooper and Rau. (2012) found that respondents in their study believed that smartphones had improved their productivity and, eventually, their learning performance. Smartphone usage positively impacts academic performance by improving communicability and accessibility to study materials, while negatively affecting concentration and lifestyle. Most respondents use smartphones for social media, with web-browser being the most frequently used mobile application for study purposes (Chathuranga and Jayasundara, 2020)

More studies on smartphone use and academic performance have been conducted in recent years. For example, Leep. Barkley and Karpinski (2015) discovered a negative relationship between calling, texting, and self-reported grade point average (GPA) among university students in the United States in their study. In another study, Further they discovered that students who used their cell phones more frequently had a lower GPA than students who used them less frequently. Based on a sample of 536 undergraduates from 82 self-reported majors at a large public university, the researchers concluded that there is an urgent need to educate students and educators about the potential academic risks associated with excessive cell phone use.

Despite widespread smartphone use among tertiary students, the extent to which this technology has aided their academic performance remains unclear. In summary, emerging research suggests that texting, Internet use, email, and social-networking sites like Facebook may increase multitasking and task switching during academic activities while decreasing academic performance. Notably, all of the previously investigated

activities show that smartphone functions are no longer limited to texting and calling; rather, a wide range of activities must be considered. As a result, measurements of cell phone use should not be limited to texting and calling, but should include a wide range of activities. As a result, measurements of cell phone use should not be limited to texting and calling, but should include a wide range of activities.

# METHODOLOGY OF THE STUDY

### Main Research Question

Is there a relationship between mobile phone usage and the academic performance of secondary school students?

### Objectives of the Study

- Find out the relationship between mobile phone usage and academic performance among secondary school students.
- Determine the relationship of the frequency of mobile phone usage with academic performance among secondary school students.
- Find out the relationship of mobile phone usage and academic performance among secondary school students of different parents' occupation.

### Hypotheses

- There is no relationship between mobile phone usage and academic performance among secondary school students.
- There is no relationship of the frequency of mobile phone usage with academic performance among secondary school students.
- There is no relationship of mobile phone usage and academic performance among secondary school students of different parents' occupation.

### Sample of the Study

A sample was chosen using the purposive sample method. The secondary school had a total of 569 students. However, only 523 students use their own phones or their parents' phones. As a result, the study's sample included 523 secondary school students from Form 1 to Upper 6. A structured random sampling method was used, with each unit in the population having an equal chance of being chosen. Secondary students were asked to participate in the study voluntarily. Respondents in this study were required to have a smartphone in order to be selected. Students could have their own smartphone or regular access to their parents' or guardians' smartphones. Given the long-standing practice of students at the target school, it was not surprising that all students used smartphones in connection with their schoolwork on a regular basis. There was no attempt to account for the gender distribution of student participants. There was no attempt made to account for the specific smartphone brand or model, or service provider that each respondent used during the study period. This decision was based on Elias (2011)'s findings that smartphone users, particularly younger users, tend to choose their preferred instrument based on factors such as the cost of the smartphone, the cost of Internet access service, screen size, ease of use, and equipment choices made by their peers. Given this, attempts to standardize the manufacturer and model of smartphones used by students in any given learning environment are unlikely to be fruitful.

### Research Design

The quantitative survey research approach was used in the method selection.

### Tools and Techniques used for Data Collection

Google Forms was used to create the students' survey. Google Forms is a tool within Google Drive that allows to create online survey forms. The personalized survey can be used to collect information from students using Google Forms. The students' data was automatically saved to a spreadsheet on Google Sheets. The spreadsheet is updated in real-time with survey responses. Google forms are widely used to quickly and easily create surveys because they allow you to plan events, ask questions of your employees or clients, and collect a variety of information in a simple and efficient manner.

In addition to the introductory questions, the students were asked the following key survey questions:

- Type of phone used by student (smart phone or traditional) • How long has the student owned the phone
- What activities do you use your phone for? The student must choose from a list of possible uses. Communication, research, social media, entertainment, and education were all on the list.
- The amount of time spent on the phone
- Time spent on the phone divided by the above-mentioned activities
- How much time is spent studying?
- Is the phone with the student when he or she goes to bed?
- Is the phone turned off when you sleep? Is the student bothered at night?
- Have parents imposed any phone usage restrictions?
- Parents' occupation
- Is the phone brought to school?
- Does the student talk on the phone at school?

The sample's academic performance for the academic years 2019 and 2020 was obtained from International School. The data was obtained in Microsoft Excel spreadsheet format from the school's Student Management System.

### Procedure of Data Analysis

This study used a quantitative method, as well as a correlational and chi-square research design, in addition to standard mean calculations. It aimed to describe the selected demographic characteristics and discover relationships between smartphone usage and academic performance among secondary school students at an international school in Sri Lanka.

## DATA ANALYSIS

### Background information of the sample

### Phone ownership and access

Table 1 in the table list shows the phone ownership and access of the International School's secondary school students. In the beginning, there were 269 students selected. However, 46 students (eight percent) do not own or have access to a smart phone. The information provided by these students was not taken into account for the remainder of the analysis. As a result, the student sample is the remaining 92 percent, or 523 students. More than 75% of students had their own phones, and 16% used their parents' phones to access the internet, according to this sample. As a result of the COVID-19 pandemic, schools are now offering online classes. As a result, there is an urgent need for students to use digital devices. The increase in smart phone ownership over the last year suggests that many parents purchased their children their own devices in

response to the requirement for online schooling.

### Gender, Age and the Grade distribution of the sample

Table 2 in the table list displays the sample distribution by age, gender, and grade level. According to the table, 44 percent of the population is between the ages of 12 and 14. These students range in age from 7 to 9. Grade 7 is the first post-primary grade, and grade 9 is the final year before the two years of ordinary level (IGCSE) classes. 29 percent of those polled are IGCSE students, while the remaining 27 percent are Advanced Level students in the Lower and Upper Sixth Grades.

### Daily usage of smartphones by students

Table 3 in the table list shows how much time students spend on their mobile phones each day for education, social media, or gaming. 79 percent of students polled spend more than 5 hours online for educational purposes, owing to the fact that weekly online school lessons typically begin at 8 a.m. and last until 12.00 or 1 p.m**.**

### Academic Performance of Students

The current situation provides a unique opportunity to compare tests administered to students, where the first set of tests was administered prior to online schooling and the second set of tests was administered after online schooling. Students who did not have their own smart phones were required to use their parents' or guardians' smart phones or any other digital device for online schooling. According to Table 4 of the table list, the overall average of students before and after online schooling shows a 1.158 drop. Four of the seven grades show a decrease in average, with Form 1 showing the greatest negative difference (-9.252). Form 5 students have the highest class average gain of 3.652.

## TESTING HYPOTHESES

**Hypotheses 1:** There is no relationship between mobile phone usage and academic performance among secondary school students.

To determine whether or not there was a link between mobile phone usage and academic performance among the sample students, the Correlation Coefficient method was used. The mean student average was taken before and after online schooling, and the correlation coefficient was calculated using Microsoft Excel. The population's correlation coefficient is 0.834, which equates to 83.44 percent, according to table 5 in the table list. In addition, a grade-by-grade correlation coefficient was calculated. These values indicate a range of 79 to 93 percent for the various grades. According to the findings, there is a positive relationship between students' use of mobile phones and their academic performance.

**Hypotheses 2:** There is no relationship of the frequency of mobile phone usage with academic performance among secondary school students.

The chi-square value in Table 6 of the table list indicates that there is a relationship between time spent on mobile phones and academic performance. When students use their phones for more than 7 hours, the number of students who obtain simple passes increases significantly. The chi-square statistic is 55.9373. The $p$-value is $< 0.00001$. The result is significant at $p < .05$. Graph 2 in the Graph list also shows the grade distribution with Time Spent on mobile phone.

**Hypotheses 3**: There is no relationship of mobile phone usage and academic performance among secondary school students of different parents' occupation.

Table 7 in the table list shows that a chi-square test of independence was used to investigate the relationship between mobile phone usage and academic performance among secondary school students from various occupations. The relation between these variables was not significant, $X^2$ (1, N = 523) = 7.8798, p = .794449. The result is not significant at p < .05. There is no significant relationship between the students' grades and parents' occupation.

## FINDINGS AND DISCUSSION

The study found a link between mobile phone usage and academic performance among secondary school students in international schools, as well as a relationship between the frequency of mobile phone usage and academic performance among secondary school students. Students were found to frequently use their smartphone cameras to capture abstract concepts in class, which they then used to connect them to concrete ideas (Norries, Hossain, and Sloway, 2011). The study further indicated that there is no relationship between mobile phone usage and academic performance among secondary school students of different parents' occupations. However, the literature review found that smartphone usage positively impacts academic performance by improving communicability and accessibility to study materials, while negatively affecting concentration and lifestyle. Most respondents use smartphones for social media, with web browsers being the most frequently used mobile applications for study purposes. Chathuranga and Jayasundara (2020)

## CONCLUSION

Students can use mobile phones as a learning tool, and they can reap numerous benefits from doing so. . Schools or parents, on the other hand, must monitor students' phone usage on a daily basis. Otherwise, the student's life will suffer as a result.

**List of Figures**



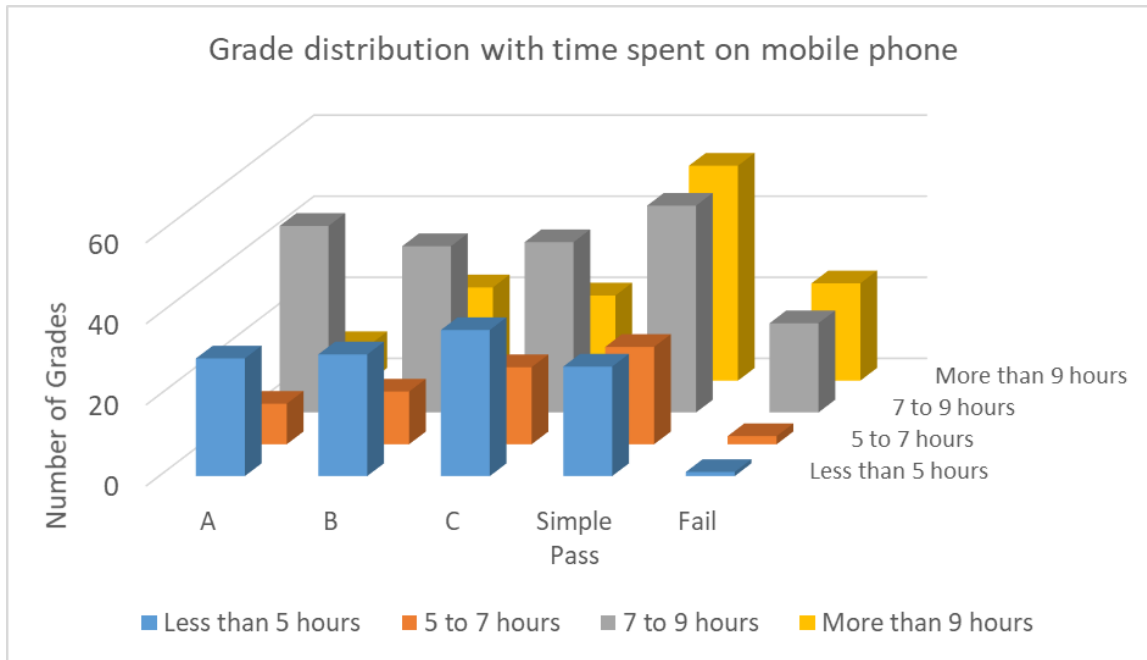Figure 1: Cone of Learning Example (Dale E. , 2021)

Figure 2: Grade distribution with Time Spent on mobile phone

**List of Tables**

Table 1: Phone Ownership/Access of the Student Sample

| Phone Ownership/Access | | |
|---|---|---|
| **Type of Phone** | **Number of Students** | **%** |
| Smart Phone | 433 | 76% |
| Parents' Phone | 90 | 16% |
| Don't have a phone nor access | 46 | 8% |
| **Total:** | **569** | **100%** |
| **Total Sample with phones** | **433+90 = 523** | |

Table 2: Sample Distribution by age, grade and gender

| Age | No. of Students | % | Boys | % | Girls | % |
|---|---|---|---|---|---|---|
| 12 to 14 | 232 | 44% | 135 | 58% | 97 | 42% |
| 15 and 16 | 151 | 29% | 69 | 46% | 82 | 54% |
| 17 to 19 | 140 | 27% | 81 | 58% | 59 | 42% |
| **Total:** | **523** | **100%** | **285** | **54%** | **238** | **46%** |

Table 3: Daily usage of Smart phone

| Task | Less than an hour | % | 1 to 2 hours | % | 3 to 5 hours | % | More than 5 hours | % |
|---|---|---|---|---|---|---|---|---|
| Online School/ Education | 5 | 1% | 5 | 1% | 80 | 18% | 343 | 79% |
| Social Media | 115 | 28% | 144 | 35% | 110 | 26% | 48 | 12% |
| Gaming | 83 | 30% | 78 | 28% | 72 | 26% | 48 | 17% |

Table 4: Comparison of Student Class Average before and after Online Schooling

| Grade | No. of Students | Before Average | After Average | Difference |
|---|---|---|---|---|
| Form 1 | 71 | 76.629 | 67.378 | -9.252 |
| Form 2 | 82 | 64.733 | 61.764 | -2.969 |
| Form 3 | 79 | 62.558 | 65.461 | 2.903 |
| Form 4 | 71 | 64.027 | 62.363 | -1.664 |
| Form 5 | 80 | 58.385 | 62.036 | 3.652 |
| Lower 6 | 68 | 60.866 | 63.979 | 3.114 |
| Upper 6 | 72 | 64.820 | 60.931 | -3.889 |
| **Average of the Averages:** | **64.574** | | **63.416** | -1.158 |

Table 5: The calculation of the correlation coefficient between mobile phone usage and academic performance among the sample students

| | Mean Before | Mean After | a x b sum | $a^2$ sum | $b^2$ sum | Correlation coefficient | Correlation as a % |
|---|---|---|---|---|---|---|---|
| Form 1 | 76.629 | 67.378 | 17001.416 | 23684.852 | 19174.968 | 0.798 | 79.78% |
| Form 2 | 64.733 | 63.249 | 18429.629 | 19470.100 | 25995.698 | 0.819 | 81.92% |
| Form 3 | 62.558 | 65.461 | 22651.936 | 26323.103 | 28344.754 | 0.829 | 82.93% |
| Form 4 | 64.119 | 62.363 | 15771.164 | 17251.329 | 16669.909 | 0.930 | 93.00% |
| Form 5 | 58.385 | 62.036 | 14054.250 | 18558.885 | 14567.350 | 0.855 | 85.48% |
| Lower 6 | 60.866 | 63.979 | 14437.920 | 13232.245 | 23969.591 | 0.811 | 81.07% |
| Upper 6 | 64.820 | 60.931 | 17524.928 | 19490.995 | 20814.781 | 0.870 | 87.01% |
| Summary | 64.587 | 63.628 | 119871.244 | 138011.510 | 149537.050 | 0.834 | 83.44% |

Table 6: Chi-Square Calculation of the relationship between the time spent on mobile phones and the academic performance

| Grades | Less than 5 hours | 5 to 7 hours | 7 to 9 hours | More than 9 hours | Row Totals |
|---|---|---|---|---|---|
| A | 29 (22.11) [2.15] | 10 (12.22) [0.40] | 46 (36.31) [2.59] | 9 (23.37) [8.83] | 94 |
| B | 30 (25.16) [0.93] | 13 (13.91) [0.06] | 41 (41.33) [0.00] | 23 (26.60) [0.49] | 107 |
| C | 36 (27.75) [2.45] | 19 (15.34) [0.87] | 42 (45.58) [0.28] | 21 (29.33) [2.37] | 118 |
| Simple Pass | 27 (36.45) [2.45] | 24 (20.15) [0.73] | 51 (59.87) [1.31] | 53 (38.53) [5.44] | 155 |
| Fail | 1 (11.52) [9.61] | 2 (6.37) [3.00] | 22 (18.93) [0.50] | 24 (12.18) [11.47] | 49 |
| Column Totals | 123 | 68 | 202 | 130 | 523 (Grand Total) |

Table 7: Chi-square calculation to determine the relationship between mobile phone usage and academic performance among secondary school students from various occupations

| | Professional | Management | Personal Business | Other | Row Totals |
|---|---|---|---|---|---|
| A | 30 (24.98) [1.01] | 21 (23.19) [0.21] | 20 (24.26) [0.75] | 23 (21.57) [0.10] | 94 |
| B | 26 (28.44) [0.21] | 27 (26.39) [0.01] | 28 (27.62) [0.01] | 26 (24.55) [0.09] | 107 |

| C | 35 (31.36) [0.42] | 33 (29.11) [0.52] | 29 (30.46) [0.07] | 21 (27.07) [1.36] | 118 |
|---|---|---|---|---|---|
| Simple Pass | 36 (41.20) [0.66] | 36 (38.23) [0.13] | 42 (40.01) [0.10] | 41 (35.56) [0.83] | 155 |
| Fail | 12 (13.02) [0.08] | 12 (12.09) [0.00] | 16 (12.65) [0.89] | 9 (11.24) [0.45] | 49 |
| *Column Totals* | 139 | 129 | 135 | 120 | **523 (Grand Total)** |

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