

# The Usage of Android Phone and the Academic Performance of the Grade 10 Students in Jose Abad Santos National High School

---

## ABSTRACT

The study aimed to determine the impact of Android phones to academic performance of Grade 10 students in Jose Abad Santos National High School. The study employed a descriptive-correlational research design. There were 182 respondents selected using stratified random sampling technique who responded the adapted survey guide questionnaire. The frequency count and percentage, mean, and Pearson product-moment correlation coefficient were the statistical tools used.

Most of the respondents were 17-18 years old, female, used Vivo android phone, and have average socio-economic status. The usage of android phones occasionally used by the respondents, in particular in the cognitive aspect. The average grade of the Grade 10 students in the first grading period of the school year 2022-2023 was 83.09 indicating that their academic performance was approaching proficiency level. Significant relationship found between the usage of android phone and academic performance of the Grade 10 students.

Moreover, the findings indicated that there was a significant relationship between android phone and academic performance of the Grade 10 students particularly their cognitive aspects in which the students develop their mental skills and acquisition of knowledge.

*Keywords: Android Phone, Academic Performance, Jose Abad Santos National High School*

## 1. INTRODUCTION

Today, there is a common focus on raising student achievement while integrating technology as a tool like smartphone use might have on both time spent and productivity for academic-related activities, smartphone use can have an additional indirect impact on educational performance by influencing students' health (Rosen et al., 2016). In recent years, an increasing amount of literature provides evidence for a negative relation between technology use, including smartphone use, and health indicators have in turn been associated with educational performance (Baert et al., 2015).

As such, negative associations were uncovered between smartphone use and sleep quality (Christensen et al., 2016), mental health (Leppet al., 2014), and physical fitness (Jackson et al., 2011). According to Johnson (2020), the computer and technology, if used correctly, has the ability to invoke dream in the minds of visionary educators who saw endless potential for altering traditional notions of teaching and learning.

High stakes testing and accountability have plagued school districts across the country since No Child Left Behind's inception in which school officials and administrators have tried everything to increase student engagement and success in the classrooms, including

incorporating technology into curricula (Hanushek & Raymond, 2005). According to the United States Department of Education (2002), the No Child Left Behind Act also sought to eliminate the digital divide and to have student technologically literate by the end of the eighth grade, regardless of race, socioeconomic status, geographic location, and disability.

Jose Abad Santos was considered a developing municipality in Davao Occidental. As to this, local government units also considered and gave much attention to the advancement of internet connectivity in the area for the benefits of the community in terms of communication, business transactions, and other personal purposes; as an outcome of this advancement, technology progression was also observed among its constituents, particularly young children, who are more exposed to the use of gadgets, particularly Android phones, for easy access to various media. As a result, the researchers were motivated to determine the level of Android phone usage among Grade 10 students in relation to their academic performance. In addition, this gave significant results on the contribution of android phones in the learning development of the students.

## 2. MATERIAL AND METHODS

The researchers employed a descriptive-correlational research design. Descriptive research is summarized using descriptive statistics while correlational research designs measure two or more relevant variables and assess a relationship between or among them (Lappe, 2000). In this study, the descriptive research design was employed to determine the level of usage of android phone while correlational research design determine the relationship between the level of usage of Android phone and the academic performance of the students in Jose Abad Santos National High School.

### Sampling Design and Technique

The respondents of the study were systematically chosen by the researchers using a stratified random sampling technique. The term "random sampling" describes several selection methods in which sample participants were chosen at random but with a known probability of selection. The sample units were people, places, land locations, or other analytical units. A crucial component of the entire survey study design is random sampling (Creswell, 2015). The respondents of the study were the one hundred eighty-two (182) students coming from Jose Abad Santos National High School. In particular, the identified Grade 10 students who used android phones for their learning. In addition, Slovin's formula was used to get the desired sample size from the given population of the study.

**Table 1:** Distribution of the Respondents of the Study

Grade & Section	POPULATION	SAMPLE SIZE
<b>Grade 10-A</b>	<b>56</b>	<b>49</b>
<b>Grade 10-B</b>	<b>48</b>	<b>43</b>
<b>Grade 10-C</b>	<b>52</b>	<b>46</b>
<b>Grade 10-D</b>	<b>50</b>	<b>44</b>
Total	206	182

Respondents of the Study

The respondents of the study were the one hundred eighty-two (182) Grade 10 students at Jose Abad Santos National High School. The actual number of populations were taken from the school planning officer designated to figure out the number of actual sample size in the study. Moreover, to ensure the qualification of the respondents, the following inclusion criteria were established: First, the respondents were the bonafide students at Jose Abad Santos National High School. Second, the respondents were the residents of the municipality of Jose Abad Santos for more than one year. Lastly, the respondents must be a Grade 10 students and used Android phones.

#### Research Instrument

To ensure that the research objectives were attained, an adopted survey questionnaire from Aksan (2021) was used in this study. This was subjected to checking, evaluation, and validation by the pool of experts. The questionnaire's Cronbach's alpha was measured at 0.85-0.91 for all 5-dimension sub-scales which indicated a high reliability score implying that the internal consistency of the items was acceptable. The questionnaire composed of the following parts: Part I- socio-demographic profile of the respondents. Part II- usage of android phones to students cognitive, psychomotor, and affective domain.

#### Data Analysis

To determine the level of usage of android phones of students in terms of cognitive, psychomotor, and affective a 5-point Likert scale was used.

Table 2. Level of usage of android phones of students in terms of cognitive, psychomotor, and affective a 5-point Likert scale

RANGE OF MEANS	DESCRIPTIVE EQUIVALENT	INTERPRETATION
4.21-5.00	Everytime	Android phones are always used by students.
3.41-4.20	Almost Everytime	Android phones are often used by students.
2.61-3.40	Occasionally	Android phones are sometimes used by students.
1.81-2.60	Almost Never	Android phones are rare used by students.
1.00-1.80	Never	Android phones are not used by students.

To determine the level of academic performance of the Grade 10 students DepEd Order No. 31, s. 2020 was used.

Table 3. level of academic performance of the Grade 10 students

PARAMETER LIMITS	DESCRIPTION	ACADEMIC PERFORMANCE
90% above	Advanced	The students at this level exceed the core requirements in terms of knowledge, skills and understanding, and can transfer them automatically and flexibly through authentic tasks.
85-89	Proficient	The students at this level has developed fundamental knowledge, skills and understanding, and can transfer them automatically and flexibly through authentic tasks.
80 -84	Approaching Proficient	The students at this level developed fundamental knowledge, skills and with guidance from the teacher or with the peers, and can transfer them these understanding through authentic tasks.
75-79	Developing	The students at this level possess the minimum knowledge and skills and core understanding but needs help throughout the performance of the authentic tasks.
74%	Beginning	The students at this level struggles with his/her understanding prerequisite and fundamental knowledge or skills have not been acquired or developed.

**Source:** DepEd Order No. 31 s. 2020

#### Data Gathering Procedure

The following data collection procedures were considered in the study:

The researchers sought approval from the Dean of the Institute of Teachers Education and Information Technology to commence the study. The approved letter was sent to the principal of the participating school for the conduct of the study. The respondents were given consent to fill out indicating their willingness to participate in the study and that they were oriented for them to fully aware of their rights and obligations in their participation. The distribution and collection of the respondents' research questionnaire were followed. The data gathered were examined using statistical methods.

#### Ethical Consideration

**Informed Consent.** Prior to the actual conduct of the study, the researchers ensure that signed informed consent is obtained from the respondents (Gablinske, 2014). In this study, the researchers made it clear that the participation was entirely voluntary, and the respondents were free to withdraw their participation at any time without incurring liability.

**Potential Risks.** The researchers explained the risks of participating in the study, particularly when answering personal questions (Siegle, 2019). In this study, the researchers, assured the respondents that the questions being asked are only those required to complete the study and are carefully crafted to avoid invasion of personal space. The researchers guaranteed that any information they share were kept strictly confidential.

**Confidentiality.** The researchers notified the respondents that the confidentiality of the information they provided for the study were prioritized. The respondent's participation were kept private until it is no longer applied. In this study, the researchers kept the data for as long as it is necessary and only be kept and used by the researchers. The privacy of the respondents were treated with respect.

**Permission from the Organization/Location.** Prior to the conduct of the study permission from the participating organization is deem necessary (Zukauskas et al., 2018). In this study, the researchers asked permission from various authorities to ensure the legality of the procedures and the authenticity of the collection of information.

**Authorship.** Acknowledging the authors of the study were considered in the conduct of the research (Horkoff, 2015). In this study, the researchers acknowledged all authors mentioned and listed in the reference section by the researchers.

#### Statistical Tools

The following are the statistical tools were used in the study:

##### Frequency and Percentage

This was used to determine the number of occurrences and percentage of the respondent's socio-demographic profile such as gender and brand of android phones.

##### Mean

This tool was utilized to determine the level of effectiveness of android phones to students cognitive, psychomotor, and affective.

##### Pearson r Correlation Analysis

This tool was used to determine the significant relationship between the effectiveness of android phones and academic performance of Grade 10 students in Jose Abad Santos National High School.

### **3. RESULTS AND DISCUSSION**

#### Socio-Demographic Profile of the Respondents

Table 4 presents the socio-demographic profile of the respondents in terms of age, gender, and socio-economic status. In terms of age, the results revealed that the highest percentage

of the respondents is (86.26%) was 17–18 years old, and the lowest was 21 years old and above, with 2.76% of the total respondents. This implies that most respondents were in the usual or exact age bracket of a Grade 10 student. The results agrees to Connelly and Zheng (2013) that in many parts of the world, students in tenth grade are usually 17 or 18 years of age. In the Philippines, the typical age range for 10th grade students is 16-17 years old. However, it's important to note that this can vary depending on a student's birthday and country of residence. In the United States, for example, students are typically 15 years old when they enter 10th grade and turn 16 during the school year. In other countries, the age range may be slightly different (Kidoneo, 2023).

In terms of gender, majority of the respondents were female with the proportion of 57.14% which was the highest. While LGBTQ got the lowest percentage of 2.20 out of the total population. In addition, male got the percentage of 40.66%. The Philippine Statistics Authority (2020) confirmed that in secondary schools, females (56.1%) outnumbered males (43.9%). Studies conducted across the world among the 10th grade students found a significant gender difference between male and female. It was confirmed in the study that their higher percentage of female (58%) than male (42%) students enrolled in 10th grade (Khwaileh & Zaza, 2022).

Lastly, for the socio-economic status, it was found that most of the respondents were in the average level of living, with the highest percentage of 86.81%, and those who were in the low level of living had the lowest percentage of 8.79%, and the high level of living was only 4.40%. This signifies that several respondents have average condition as to their socio-economic status. This agrees to the findings of Colley (2012) who stated that 45% of the students in the Philippines belong to average level of socio-economic status in which most of them can sustain their education from primary to higher education. In addition, Philippine Population (2020) reported that 53% of the Filipino students studying in public schools are belong to the middle class with parents working for living.

**Table 4. Socio-Demographic Profile of the Respondents**

PARTICULAR	FREQUENCY	PERCENTAGE
Age		
17-18	157	86.26
19-20	20	10.98
21 and above	5	2.76
Gender		
Male	74	40.66
Female	104	57.14
LGBTQ	4	2.20
Socio-Economic Status		
High	8	4.40
Average	158	86.81
Low		

	16	8.79
<b>Total</b>	<b>182</b>	<b>100</b>
Age		
17-18	157	86.26
19-20	20	10.98
21 and above	5	2.76

\*

#### Level of Usage of Android Phones

Table 5 presents the summary of level of usage of Android phones that affects students' academic performance. The results revealed that cognitive domain got the highest mean of 3.50 (almost everytime). This implies that students often used Android phone. Meanwhile, psychomotor got the lowest mean of 3.31 (occasionally). This means that sometimes students used Android phone. Moreover, a grand mean of 3.40 was accumulated which describes as occasionally. This further implies that students sometimes used Android phones for their learning at school.

Given the versatile functions, Android phones have been rapidly integrated into communication and learning, among other domains, and have become an inseparable part of daily life for many. Android phones are perceived as convenient, easy-to-use tools that increase psychomotor and affective skills and facilitate both formal and informal learning that promotes cognitive development (Looi et al., 2016). Yi et al. (2016) have investigated the impacts of Android phones in education particularly in the learning development of the students as to their cognitive, psychomotor, and affective skills. For example, Anshari et al. (2017) asserted that the advantages of smartphones in educational contexts include rich content transferability and the facilitation of knowledge sharing and dynamic learning. Modern students expect to experience multiple interactive channels in their studies.

**Table 5. Summary of the Results on the Level of Usage of Android**

<b>DOMAINS</b>	<b>MEAN</b>	<b>DESCRIPTION</b>
<b>Cognitive</b>	<b>3.50</b>	<b>Almost Every time</b>
<b>Psychomotor</b>	<b>3.31</b>	<b>Occasionally</b>
<b>Affective</b>	<b>3.40</b>	<b>Occasionally</b>
<b>Grand Mean</b>	<b>3.40</b>	<b>Occasionally</b>

#### Level of Usage of Android Phones in Terms of Cognitive

Table 6 shows the descriptive results of the level of usage of android phones in terms of cognitive. Respectively, a grand mean of 3.50, described as almost everytime, was accumulated across the given indicators. This implies that the respondents often used their Android phones as support for their study. Further, the student has a balance when using an Android phone and does not rely heavily on it in doing task at school or become addicted to it. It was found out that students in Grade 10 are already responsible for the proper usage of Android phones. Kibota and Mgaya (2015) asserted that students used Android phones for their studies and other recreational activities, which helped increase their academic performance.

Furthermore, Ezemenaka (2013) cited that some learning systems have emerged over the years and used by the students in their studies to achieve better academic outcomes.

The cognitive domains of the Android phone usage obtained the highest mean of 3.50, which is described as almost every time. Further, the Grade 10 students often used their Android phones in the process of thinking about and understanding the lesson. Constant access to a limitless database of knowledge should improve cognition, much has been written about how the rapidly changing landscape of technology is negatively affecting how we remember our own lives, the places we have been, and those with whom we have interacted (Özkul & Humphreys, 2015). However, as with attentional impact, the body of empirical evidence demonstrating tangible effects of mobile media devices on memory and knowledge is limited (Frith & Kalin, 2015).

In cognitive domain item numbers 2 “They can verify whatever discussions have in the lesson that leads me for better understanding” and 5 “They can search additional information that broadens my knowledge” got the highest mean of 3.65 described as almost everytime which indicates that android phones are often used by students. This means that the respondents often broaden their understanding by having verification of the lessons or topics they did not understand by using the android phones for searching and often looking for more details or additional information that widens the discussion of the topics. The results was similar to the findings of Pentzold and Sommer (2011) that android phones help the students access information about their lessons. This also widen their understanding on the particular topic presented by the teachers. Educational activities that incorporate android phone use are accessing of course content, inspiring sharing and discussion session between teachers and students and retrieving information regarding students’ performances (Cochrane, 2010).

Meanwhile, the item number 1, “They can search and explore the topic for them to understand it better” obtained the lowest mean of 3.34 describe as occasionally which means that android phones are often used by students. This implies that the respondents often utilized their Android phones to search for topics or lessons to enhance and improve their prior knowledge of the lessons presented by their teachers. Studying and dissemination is a contribution which the educational institutions can do best, (Franca, G. 2021).

Though it may seem as if constant access to a limitless database of knowledge should improve cognition, much has been written about how the rapidly changing landscape of technology is negatively affecting how students interacted socially (Frith & Kalin, 2015; Özkul & Humphreys, 2015). However, as with attentional impact, the body of empirical evidence demonstrating tangible effects of mobile media devices on memory and knowledge is limited (Frith & Kalin, 2015).

Table 6. Level of Usage of Android Phones in terms of Cognitive

Statements	Mean	Interpretation
1. They can search and explore the topic for them to understand it better.	3.34	Occasionally
2. They can verify whatever discussions they have in the	3.65	Almost Every time

lesson that leads them for better understanding.		
3. They can search for more terms and words for deeper understanding.	3.42	Almost Every time
4. It helps widen their understanding though browsing in different websites for further information	3.45	Almost Every time
5. They can search additional information that broadens their knowledge.	3.65	Almost Every time
<b>Grand Mean</b>	<b>3.50</b>	<b>Almost Every time</b>

Table 7 presents the level of usage of android phones in terms of psychomotor. The results revealed that the level of usage of android as to the psychomotor domain revealed a grand mean of 3.31 described as occasionally which means that students sometimes used android phones. This implies that sometimes, using Android phones affects students' academic performance based on psychomotor domain. Psychomotor skills are skills that require integration of motor skills that related to knowledge and values with require practice to master, example of psychomotor skills in teaching a subject is using android phones (Tollefson & Hillman, 2019).

Accordingly, it was found in item number 4 "They are more motivated to perform the learning task because they can search it in their android phone" has the highest mean of 3.56 describe as almost everytime which indicates that students often used android phones. This means the students often used android phones in searching in the internet increased respondents' motivation for learning. Similar to the study of Tollefson and Hillman (2019), that the manipulation of Android phones as it integrates and is used for students' learning enhances their motivation for learning through psychomotor abilities, which are skills that need integrating motor skills.

On contrary, the lowest mean 2.79 described as occasionally was found in item number 1 "They can manipulate technology by watching demos in their android phone" which illustrates that android phones are sometimes used by students. This further implies that the skills of the respondents often observed in manipulating technology for learning becomes easy by watching free demos on the internet using Android phones. The Android phone display is mostly a "touch" screen that can enable its user for using a virtual keyboard for typing words and numbers along with simply pressing on-screen icons for activation of various app-based features. It allows students to watch free various demos for them to familiarize themselves and master the learning contents they wanted to learn (Bisen & Deshpande, 2016).

**Table 7. Level of Usage of Android Phones in Terms of Psychomotor**

<b>Statements</b>	<b>Mean</b>	<b>Interpretation</b>
1. They can manipulate technology by watching demos in their android phone.	2.79	Occasionally
2. They can perform the	3.19	Occasionally

performance task through watching videos in their android phone.		
3. They can finish their task easily with the help of android phone.	3.49	Almost Everytime
4. They are more motivated to perform the learning task because they can search it in their android phone.	3.56	Almost Everytime
5. They can choose different apps that guide them in performing different tasks.	3.52	Almost Everytime
<b>Grand Mean</b>	<b>3.31</b>	<b>Occasionally</b>

### Level of Usage of Android Phones in Terms of Affective

Table 8 as to the level of usage of Android phones in the affective domain, the results disclosed a grand mean of 3.40, which was described as occasionally, which means that the students sometimes used Android phones. In some previous studies on small displays (Chen et al., 2013; Maniar et al., 2017), Android phones were found to create affective advantages related to students' attention and perception (Kim & Kim, 2013). However, students have also reported wanting to have more options to make learning tools more convenient so they can study when and where they want to. Typically, the use of personal devices affords students' ownership of learning, which may lead to positive language learning experiences (Kukulska-Hulme, 2017).

Indicatively, item number 4, "They develop a sense of confidence presenting their outputs because they can ensure that the information, they search in their android phone is relevant," shows the highest mean percentage of 3.57, described as almost every time, which stresses that android phones are often used by students. This means that the respondents gain higher confidence in presenting their outputs knowing that the information written or included in their outputs was accurately searched on the internet using their Android phones. Lan and Huang (2016) agreed with the results, as he stated that the advances in mobile technologies have enabled students to learn in advance and make them confident while expanding their knowledge across the curriculum. Maniar et al. (2017) supported the idea that technology increases the productivity of students, which leads to better academic performance.

Meanwhile, statement number 1, "They feel at ease while learning using their Android phone", has the lowest mean of 3.24, which indicates that the respondents sometimes use Android phones. This implies that the students felt at ease and convenient using their Android phones as digital devices to search for information for higher learning.

With new technologies like Android phones, students become more convenient and at ease while engaging in different subjects and completing learning tasks through voice, image, and text. Using mobile devices for educational purposes is becoming a common expectation among learners (Chen et al., 2013). Similarly, Valk et al. (2015) demonstrated that Android phones facilitate learning and give

students an avenue to access educational materials and services, particularly in rural and remote regions.

Table 8. Level of Usage of Android Phones in Terms of Affective

Statements	Mean	Interpretation
1. They feel at ease while learning using their android phone.	3.24	Occasionally
2. They give more value about the lesson by searching relevant information.	3.41	Almost Everytime
3. They are empowered to perform related activities because they can search information in android phone.	3.42	Almost Everytime
4. They develop a sense of confidence in presenting outputs because they can ensure that the information search in android phone is relevant.	3.57	Almost Everytime
5. They feel connected with the lesson presented by the teacher because they can review it using android phone.	3.35	Occasionally
<b>Grand Mean</b>	<b>3.40</b>	<b>Occasionally</b>

### Level of Students AcademicPerformance

Table 9 exhibits the descriptive results on the level of students' academic performance. In general, the respondents' academic performance is found to be approaching proficiency with a mean of 83.09, which implies that the students at this level have developed fundamental knowledge and skills with guidance from the teacher or with their peers and can transfer these understandings through authentic tasks. Further, it implies that teachers need to guide and help the students learn and meet their learning needs within the specific learning areas. This is a good indication of the numerous benefits that Android phones have brought to students: it advances their understanding by increasing academic performance, social media participation, and information sharing; it helps their social skills by giving them opportunities to seek academic assistance and support; and many more (Mokoena, 2012). However, in school, teachers need to guide the students, especially in using technology like Android phones, to ensure that learning takes place (Emerson & Berge, 2018).

Indicatively, it was revealed that 50% of the total respondents academically performed with a grade range of 80–84% (approaching proficient), which implies that the students at this level developed fundamental knowledge and skills with guidance from the teacher or with their peers and could transfer these understandings through authentic tasks. Despite the positive contribution of technology like Android phones, some students struggle in their academic performance, and the guidance and presence of teachers and peers are highly

considered for students to have better performance in their studies (Tikoria & Agariya, 2017). Academic learning is now innovative as a result of Android phones and other media in promoting and advancing 21st century skills and knowledge with the guidance of parents and teachers (Tulenko & Bailey, 2013; Emerson & Berge, 2018). Students have experiences of digital surroundings in a tactile and personal manner, which is brought about by some mobile devices like Android phones, which helps improve academic performance (Cano, 2012).

On the contrary, 0.55% of the respondents, which was the lowest, got a grade range of 74% below. This means that the student at this level struggles with understanding prerequisites and that fundamental knowledge or skills have not been acquired or developed. According to Tikoria and Agariya (2017), with the advent of technology like Android phones, learning has become easier and more accessible. However, some students still struggle in their studies due to misuse of technology or lack of capacity to manipulate technology, which results in low academic performance.

In addition, 20.33% of the respondents have a grade of 85%–89% described as proficient, another 20.33% have a grade of 75%–79% described as developing, and 8.79% have a grade of 90% and above described as advanced. Mokoena (2012) argues that the use of Android phones by students improves collaborative learning through their connection to the internet. This statement implies that the use of Android phones drives students to be more engaged in learner-centered participation learning, which increases their academic performance.

**Table 9. Level of Students Academic Performance**

<b>GRADE RANGE</b>	<b>FREQUENCY</b>	<b>PERCENTAGE (%)</b>	<b>INTERPRETATION</b>
<b>90% and above</b>	<b>16</b>	<b>8.79</b>	<b>Advanced</b>
<b>85%-89%</b>	<b>37</b>	<b>20.33</b>	<b>Proficient</b>
<b>80%-84%</b>	<b>91</b>	<b>50.00</b>	<b>Approaching Proficient</b>
<b>75%-79%</b>	<b>37</b>	<b>20.33</b>	<b>Developing</b>
<b>74% below</b>	<b>1</b>	<b>0.55</b>	<b>Beginning</b>

\*n=182, mean= 83.09, SD=4.95

Relationship Between the Usage of Android Phone and Academic Performance of Grade 10 Students in Jose Abad Santos National High School.

Table 10 presents the relationship between the usage of an Android phone and the academic performance of grade 10 students at Jose Abad Santos National High School. The overall results revealed an r-value of -0.17, which describes a slight negative correlation which means that one variable increases the other variable decreases, and a p-value of 0.01, which is less than the 0.05 level of significance, which found a significant relationship between usage of an Android phone and academic performance; hence, the null hypothesis is rejected. Thus, the negative correlation indicates that as the level of one variable increases, the level of the other variable decreases. Abdullah et al. (2012) reported that students often use their Android phones for personal communication rather than for

learning. A recent study done by Tossell et al. (2015) found that Android phone use was perceived as favorable prior to study but later revealed students viewed Android phones as detrimental to their educational goals in the end.

Specifically, cognitive has an r-value of -0.23, which means negative low correlation, which implies that one variable increases the other decreases, and a p-value of 0.01 which implies a significant relationship. Students nowadays have experiences of digital surroundings in a tactile and personal manner, which is brought about by some Android phones devices (Cano, 2012). Mokoena (2012) argues that the use of Android phones by students improves cognitive learning skills through its connection to the internet. Psychomotor has an r-value of -0.12, which means negative slight correlation, which implies that one variable increases the other decreases, and a p-value of 0.09 implies no significant relationship; affective has an r-value of -0.13, which indicates a negative slight correlation, which implies that one variable increases the other decreases, and a p-value of 0.06 found not significant. Accordingly, only the cognitive domain has a significant relationship to the usage of Android phones. This further implies that using Android does not guarantee an increase in academic performance. Woodcock et al. (2012) confirmed that various areas of students' lives would change by increasing Android phone use as students began to utilize this device to increase their learning knowledge, but they did not guarantee an increase in academic performance.

However, as to the individual results on the indicators of academic performance, only the cognitive domain has a significant relationship to the usage of Android phones, with a p-value of 0.01 compared to a 0.05 level of significance and an r-value of -0.23 indicating a negative low correlation, which implies that one variable increases while the other decreases. Meanwhile, the psychomotor and affective domains show no significant relation to the usage of Android phones. Accordingly, psychomotor has a p-value of 0.09, which means it is not significant, and -0.12, which implies a slight negative correlation, which implies that one variable increases while the other decreases. Lastly, the affective domain has a p-value of 0.06, which means it is not significant, and -0.13, which directly means a low negative correlation. It further explains that one variable increases while the other decreases.

Similarly, Koszalka and Ntloedibe-Kuswani (2010) cited that the most popular trend in terms of Android phones use can be seen in the growth of dependency on mobile-connected devices, which is not limited to daily tasks but has also been utilized in educational environments. Cochrane (2010) supports the results by stating that educational activities that incorporate Android phone use include accessing course content, inspiring sharing and discussion sessions between teachers and students, and retrieving information regarding students' performances. Therefore, android phone use may lead to important influence in enhancing students' performance as this device might boost teaching and learning experience.

According to Clements (2021), using an Android phone in a classroom environment can further educate students about the advantages they may experience, such as the ability to learn anything at any time and from anywhere, as well as motivate them to engage in learning activities that improve their prospects, particularly academically.

Froese et al. (2012) conducted a self-reported survey to investigate students' Android phone activity in classes and the potential effect of the activities on students learning performance. The result indicates that the use of an Android phone distracts students learning processes, and students believe that their classroom learning is disrupted during texting. Another study was conducted by Tindell and Bohlander (2012) to understand the use and misuse of Android phones in lecture settings. The finding shows that students are not paying attention to their class lecturer because they are spending too much time texting. A study conducted by Elder (2013) shows that students who used Android phones in class scored lower than students who did not use Android phones, and they even were not able to recall much information from the lecture.

Android phones have impacted students' lives in many ways, particularly in education. It introduces students to the world of knowledge and gives them the ability to connect to academic-related materials online at any time, allowing them to access various learning resources and continue their education through distance learning (Sarwar & Soomro, 2013).

life satisfaction and are more likely to be prone to Android phone addiction. However, utilizing the Android phone for a long period of time might affect a person's health and lead to interruptions in students' concentration and focus on completing their coursework, which will affect their academic performance negatively (Abu-Shanab, 2015). A study by Samaha and Hawi (2016) reported that the risk of Android phone addiction can be associated with life satisfaction via academic performance and perceived stress. It shows that students who achieve low academic performance will likely experience less.

**Table 10. Relationship Between the Usage of Android Phone and Academic Performance of Grade 10 Students in Jose Abad Santos National High School**

<b>Learning Domains</b>	<b>r-value</b>	<b>Description</b>	<b>p-value</b>	<b>Interpretation</b>
<b>Cognitive</b>	<b>-0.23</b>	<b>Low Correlation</b>	<b>0.01</b>	<b>Significant</b>
<b>Psychomotor</b>	<b>-0.12</b>	<b>Slight Correlation</b>	<b>0.09</b>	<b>Not Significant</b>
<b>Affective</b>	<b>-0.13</b>	<b>Slight Correlation</b>	<b>0.06</b>	<b>Not Significant</b>
<b>Overall Usage:</b>	<b>-0.17</b>	<b>Slight Correlation</b>	<b>0.01</b>	<b>Significant</b>

#### **4. CONCLUSION**

Based on the findings presented the following are the conclusions drawn:

The biggest proportion of the respondents who participated in the study were aged 17–18 years old. The female group of Grade 10 students has an average socio-economic status. This further implies that those with average incomes can only afford to have Android phones to use in their studies. Furthermore, the students often used Android phones, which affected their cognitive domain almost every time compared to their psychomotor and affective

domains. Meanwhile, the grade 10 students performed academically within proficient levels. However, the majority of the students were still approaching proficiency, and few were academically advanced. Moreover, the level of usage of android phones has significant relationship to the academic performance of the Grade 10 students. However, it has a negative correlation. Hence, the null hypothesis is rejected.

### **Recommendations**

The following recommendations were derived from the findings and conclusions of the study:

1. Based on the given conclusion, it is recommended that DepEd officials develop programs and activities that help students gain a more comprehensive understanding of the contributions and great importance of the integration of technology in education as tools that aid in producing quality learning outcomes, like symposiums and seminars.
2. In reference to the results of the study, it is recommended that the school administrator may guide the students at school on the proper utilization of technology like android phones towards their learning in different subject areas to ensure that technology is properly used or materialized to gain better understanding of the topic or lesson.
3. Based on the results of the study, it is recommended that the teachers may implement strong discipline among students on the usage of Android phones by limiting their time of usage, especially during class hours, to ensure that the students can focus on their learning activities and perform better academically.
4. Anchored on the results of the study, it is recommended that the students possess the discipline and a broader understanding of the use of Android phones in their studies to improve their academic performance by having time management skills with the use of Android phones. It is also recommended that they become responsible for whatever actions they have to take towards using Android phones in their learning, like providing immediate solutions to any problems.
5. Future researchers may consider the results of the present study in drafting related studies to broaden the results of the study about the usage of Android phones and the academic performance of the students.

## CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

## REFERENCES

Abdullah, Y., Sedek, M., Mahat, J., & Zainal, N. (2012). Individual characteristic in online gaming and mobile application use among students in higher education institution: A confirmatory factor analysis. *Prosiding Seminar Institusi Pendidikan Tinggi*, 1(1).

Abushanabe, E. (2015). The Influence of Smart Phones on Human Health and Behavior: Jordanians' Perceptions. *International Journal of Computer Networks and Applications*, 2(2), 52-56.

Amiriono, R. & Daryanto, A. (2016). *Evaluasi dan Penilaian Pembelajaran Kurikulum*, Yogyakarta: Gava Media.

Anderson, M. (2021). More Americans using smartphones for getting directions, streaming TV. Washington, D.C.: Pew Research Center Retrieved from <http://www.pewresearch.org/fact-tank/2016/01/29/us-smartphone-use/>.

Anderson, M., & Horrigan, J. B. (2021). Smartphones help those without broadband get online, but don't necessary bridge the digital divide. Washington, D.C.: Pew Research Center Retrieved from <http://www.pewresearch.org/facttank/2016/10/03/smartphones-help-those-without-broadband-get-online-but-dont-necessarily-bridge-the-digital-divide/>.

Baert, S., Omev, E., Verhaest, D., & Vermier, A. (2015). Mister Sandman, bring me good marks! On the relationship between sleep quality and academic achievement. <https://www.sciencedirect.com/science/article/abs/pii/S0277953615000945>

Boghossian, P. (2019). Behaviorism, constructivism, and Socratic pedagogy. *Educational Philosophy and Theory*, 38(6), 713–722 <https://doi.-org/10.1111/j.1469-5812.2006.00226.x>.

Cano, E. V. (2012). Mobile learning with Twitter to improve linguistic competence at secondary schools. *New Educational Review*, 29(3), 134–147.

Cassidy, E. D., Colmenares, A., Jones G., Manolovitz, T., Shen, L., & Viera, S. (2019). Higher Education and Emerging Technologies: Shifting Trends in Student Usage. *The Journal of Academic Librarianship*, 40, 124–133. doi:10.1016/j.acalib.2014.02.003.

Chen, L., Xie, X., Fan, X., Ma, W., Zhang, H., & Zhou, H. (2013). A visual attention model for adapting images on small displays. *ACM Multimedia Systems Journal*, 9(4), 353–364. doi: 10.1007/s00530-003- 0105-4

Day, S., & Erturk, E. (2017). e-Learning objects in the cloud: SCORM compliance, creation and deployment options. *Knowledge Management & E-Learning (KM&EL)*, 9(4), 449–467.

Elder, A. D. (2013). College students' cell phone use, beliefs, and effects on their learning. *College Student Journal*, 47(4), 585-592.  
<http://web.b.ebscohost.com/ehost/pdfviewer/pdfviewer?vid>

Ezemenaka, E. (2013). The usage and impact of Internet enabled phones on academic concentration among students of tertiary institutions: A study at the University of Ibadan, Nigeria. *International Journal of Education and Development using Information and Communication Technology (IJEDICT)*, 9(3), 162–173.

Fisher, A., Exley, K., & Ciobano, D. (2019). *Using technology to support learning and teaching*. London: Routledge, Taylor & Francis Group.

Franca, G. C. (2019). Conflict resolution skills and team building competence of school heads: a model effectiveness school management. *SPAMAST Research Journal*, 7(1), 34-46.

Franca, G. C. (2021). Blaauw T'logan: The Marker of Tribal Identity. *Asian Journal of Education and Social Studies*, 22(1), 44–50. <https://doi.org/10.9734/ajess/2021/v22i130520>

Froese A. D., Carpenter, C. N., Inama, D. A., Schooley, J. R., Barnes, R. B., Brecht, P. W., & Chacon, J. D. (2012). Effects of classroom cell phone use on expected and actual learning. *College Student Journal*, 46(2), 323-332.  
<http://web.a.ebscohost.com/ehost/pdfviewer?vid=5&sid=c47a113c-266f-4e8a-9da84c55fc6c2d2f%40sessionmgr4001&hid=4106>

Gandhi, P., Khanna, S., & Ramaswamy, S. (2019). Which industries are the most digital (and why?). Retrieved from <https://hbr.org/2016/04/a-chart-that-shows-which-industries-are-the-most-digital-and-why>.

Harris, C. J. (2020) The effective integration of technology into schools' curriculum. *Distance Learning*, (2), 27.

Humphreys L. & Liao T. (2011). Mobile geotagging: reexamining our interactions with urban space. *J. Comput. Mediat. Commun.* 16 407–423. 10.1111/j.1083-6101.2011.01548.x

Jackson, C. (2011). Internet use, videogame playing and cell phone use as predictors of children's body mass index (BMI), body weight, academic performance, and social and overall self-esteem. <https://www.sciencedirect.com/science/article/abs/pii/S0747563210003171>

Johnson, A. (2020). Differential effects of parental involvement on cognitive and behavioral outcomes by socioeconomic status. *Journal of Socioeconomics* 30(2), 171.

Kaare, S. S., & Sain, S. K. (2020). ICT Application in Education: An Overview. *International Journal of Multidisciplinary Approach & Studies*, 2(1), 25–32.

Kibona, L., & Mgaya, G. (2015). Smartphones' effects on academic performance of 308 I. P. Ifeanyi & J. E.

Kidoneo (2023). Aging up: what to expect in 10th grade for students of any age. <https://kidoneo.com/10th-grade-age/>

Klopfer, E., Osterweil, S., Groff, J., & Hass, J. (2019). The instructional power of digital games, social networking, simulation, and how teachers can leverage them. *The Education Arcade*, 1-21. Retrieved August 10, 2020, from [http://education.mit.edu/wpcontent/uploads/2015/01/GamesSimsSocNets\\_EdArcade.pdf](http://education.mit.edu/wpcontent/uploads/2015/01/GamesSimsSocNets_EdArcade.pdf)

Komarraju, M. & Nadler, D. (2013). "Self-efficacy and academic achievement: why do implicit beliefs, goals, and effort regulation matter," *Learning and Individuals Differences*, vol. 25, pp. 67-72. <https://doi.org/10.1016/j.lindif.2013.01.005>

Koszalka, T. A (2010). Literature on the safe and disruptive learning potential of mobile technologies. *Distance Education.*, 31(2), 139-157. <https://doi.org/10.1080/01587919.2010.498082>.

Kuhn, A. (2010). Memory texts and memory work: performances of memory in and with visual media. *Mem. Stud.* 3 298–313. [10.1177/1750698010370034](https://doi.org/10.1177/1750698010370034)

Kukulka-Hulme, A. (2017). Will mobile learning change language learning? *European Association for Computer Assisted Language Learning*, 21(2), 157–165. Retrieved from <http://oro.open.ac.uk/16987/2/>

Khawaile, H. (2022). Gender differences in academic performance among undergraduates at the University of Jordan: Are they real or stereotyping? *College Student Journal*, 45. <https://www.studocu.com/ph/document/cebu-normal-university/media-and-information-literacy/82820-grade-10/24475911>

Lan, Y.F., & Huang, S.M. (2016). Using mobile learning to improve the reflection: a case study of traffic violation. *Educational Technology & Society*, 15(2), 179–193. Retrieved from [http://www.ifets.info/journals/15\\_2/16.pdf](http://www.ifets.info/journals/15_2/16.pdf)

Lawrence, B., & Lentle-Keenan, S. (2021). Teaching beliefs and practice, institutional context, and the uptake of Web-based technology. *Distance Education*, 34(1), 4–20.

Leppet, A., Seilhammer, R., Bennet, L., & Bauer, S. (2014). Students' mobile learning practices in higher education: A multi-year study. In *EDUCAUSE Review* Retrieved from <http://er.educause.edu/articles/2015/6/students-mobile-learning-practices-in-higher-education-a-multiyear-study>

Llinder-VAanberschot, J. A., & Summers, L. L. (2020). Designing instruction in the face of technology transience. *Quarterly Review of Distance Education*, 16(2), 107–118.

Maniar N., Bennette, E., Hand, S., & Allan, G. (2017). The effect of mobile phone screen size on video based learning. *Journal of Software*, 3(4), 51–61. Retrieved from <http://ojs.academypublisher.com/index.php/jsw/article/view/03045161/974> .

Nelson R. (2021). Apple's app store will hit 5 million apps by 2020, more than doubling its current size. Retrieved from <https://sensortower.com/blog/app-store-growth-forecast-2020>.

Ormrod, J.E. (2019). Psikologi Pendidikan, Jakarta: Erlangga. [https://www.researchgate.net/publication/328630284\\_Effectiveness\\_of\\_using\\_information\\_services\\_with\\_the\\_collaborative\\_learning\\_through\\_facebook\\_improving\\_self\\_regulated\\_learning](https://www.researchgate.net/publication/328630284_Effectiveness_of_using_information_services_with_the_collaborative_learning_through_facebook_improving_self_regulated_learning)

PHILIPPINES POPULATION (2020). Poverty rate of Filipino students in the Philippine public schools. <https://countrymeters.info/en/Philippines>

PHILIPPINE STATISTICS AUTHORITY (2020). Cell Phone Usage in Schools: Statistics and Insights. <https://www.tmcnet.com/topics/articles/2021/05/06/448799-effect-cell-phone-use-academic-performance.htm>

Pouster, J. (2020). Smartphone ownership and internet usage continues to climb in emerging economies. Washington, D.C.: Pew Research Center Retrieved from <http://www.pewglobal.org/2016/02/22/smartphone-ownership-and-internet-usage-continues-to-climb-in-emerging-economies/>.

Spears S.A. (2018). Technology-enhanced learning: The effects of 1:1 technology on student performance and motivation (Doctoral Thesis). University of West Florida. <https://files.eric.ed.gov/fulltext/EJ1117604.pdf>

Sulzenbruck, S., Hegele, M., Rinkenauer, G., Heuer, H. (2019). The death of handwriting: secondary effects of frequent computer use on basic motor skills. *Journal of Motor Behavior*, 43(3), 247-251. doi:10.1080/00222895.2011.571727.

Tollefson, J. & Hillman, E. (2019). *Clinical Psychomotor Skills: Assessment tools for nurses (3-point)*, Melbourne: Cengage Learning Australia Pty Limited.

Weichart, G., Stary, C., & Appel, M. (2018). The digital Dalton Plan: Progressive education as integral part of web-based learning environments. *Knowledge Management & E-Learning (KM&EL)*, 10(1), 25–52

Wright, G. B. (2020). Student-centered learning in higher education. *International Journal of Teaching and Learning in Higher Education*, 23(3), 92–97.