

Examining the Extent of Utilization and the Students' Perceptions of Tablets in Senior High Schools in Quezon City

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Abstract: The worldwide suspension of the face-to-face conduct of classes in schools during the COVID-19 pandemic led to the increased use and adoption of technology in education. Blended and online learning modalities prompted the use of mobile technology, highlighting the significance of mobile learning (m-learning) and the use of tablets. This paper examined the extent of utilization and the students' perceptions of the use of tablets by senior high school students in Quezon City, Philippines. A quantitative, descriptive research methodology was adopted by fielding an online survey questionnaire adapted from the study by Narayan and Naidu (2020) with some contextual modifications. From a population of 33,944, 1,355 responded to the survey. The results underscored the students' effective use of the tablets and their high perception of their usefulness in the learning process. As evidenced in this study, the benefit of mobile learning was observed more in those doing distance (blended) learning but lower in face-to-face classes. Taking into account the experiences of other countries' tablet program implementation, it was recommended that the adoption of tablets or mobile learning should be accompanied by relevant improvements in teaching content and methodologies and capacity building of teachers and students for a more successful implementation. This paper further recommended expanding the scope to include perceptions of junior high school and elementary students to make the study more conclusive and to examine teachers' perceptions and behaviors on using tablets as a teaching and learning medium, as these insights could potentially shape future improvements in education technology.

Key Words: Mobile Learning, Tablets, ICT in education, Education Technology, education in the time of COVID

1. INTRODUCTION

Technology integration in education started at the inception of the Internet and personal computers and increased exponentially in the last decade (Ditzler et al. (2016). However, the worldwide suspension of the face-to-face conduct of education in schools, universities, and other higher educational institutions in the 1st quarter of 2020 due to the Covid-19 pandemic promoted and contributed to the greater use and adoption of technology in education (Prasetyo et al., 2021, Kadum et al., 2023, Chen et al., 2023). To ensure learning continuity during the social isolation, teaching and learning delivery transitioned

to distance learning approaches such as blended and online learning.

Online learning is a modality enabled by computers connected to a network where students and teachers can meet anytime and anywhere (Cojocariu et al., 2014; Singh and Thurman, 2019, as cited by Tewari et al., 2023). Online classes use various platforms such as Google Meet, Zoom, Microsoft Teams, Blackboard Collaborate, and other similar technologies. Online meeting platforms have become a virtual learning environment where students and teachers can easily communicate, meet, and discuss lessons. In these platforms, electronic resources such

as e-books, reading materials, pre-recorded presentations, and online quizzes and assignments are uploaded by teachers through the use of the Internet, which the students can access anytime and anywhere (Prasetyo et al., 2021, Tewari et al., 2023).

The blended and online learning modalities "prompted the adoption of technological devices for course delivery, thereby highlighting the significance of mobile learning (m-learning) and allowing educators, students, and other stakeholders in the education sector to recognize its potential, advantages, drawbacks, and challenges" (Chen et al., 2023, p.1). Amidst unexpected social isolation, students and teachers relied on mobile devices for connection. (Chen et al., 2023).

Research done by Statti & Villegas (2020) indicates that cost-effectiveness, student attitudes, usefulness, and ease of use are all significant benefits to mobile learning and the adoption of mobile learning devices in schools (Pappas et al. (2017). The study also revealed that with mobile devices integrated into a curriculum, "students are more engaged with the content, enjoy the learning process, provide their classmates with mutual encouragement, and report a reduction in embarrassment and nervousness during the learning process (Kukulska-Hulme & Viberg, 2018)" (Statti & Villegas, 2020, p.140).

Tablets are popularly used for m-learning. Its mobility, attractiveness, ease of use, ubiquity (Lang & Šorgo, 2023), and portability (Yalman & Basaran, 2021; Zhang & Nouri, 2018) are the main features that influenced the difference in teaching and learning delivery. Its wide range of available applications has also resulted in many ways the tablet can be utilized. In a way, the tablet has bridged the gap between the smartphone and the laptop computer in that the tablet has the capacity and usability of a laptop computer for a broad and effective variety of content creation and is also as mobile and portable as a smartphone, making it available "24-7" (Rikala et al., 2013).

With the perceived benefits of tablets and the perception that providing students with contemporary technologies will resolve educational access issues and transform the educational context, several countries worldwide have launched large-scale, government-supported initiatives to distribute tablet-computing devices to students in the K–12 schooling sector, even before the pandemic. As documented by Tamim, et al. (2015), 11 countries around the world, including Antigua & Barbuda, Australia, Brazil, India, Iran,

Jamaica, Kazakhstan, Pakistan, Russia, Turkey, and the United Arab Emirates, made magnitude investments in tablets with the goal of reforming educational systems and hoping to make K–12 classrooms more motivating and engaging for their learners, and the dream of bringing literacy to children especially those in the rural areas. However, most of these initiatives were launched with strong enthusiasm and optimism but little critical thought and planning to allow for successful implementation (Tamim et al., 2015).

Several other countries, including the USA, South Korea, England, Spain, Portugal, Singapore, and Turkey, have implemented tablet devices for educational use at different scales (Duran & Aytac, 2016; Semerci, 2018, as cited by Zhang, 2022). However, the introduction of tablet devices challenges current teaching modalities, even though they bring new pedagogical approaches and a different perspective on education (Litzler & Laborda, 2016; Male & Burden, 2014, as cited by Zhang, 2022).

Zhang (2022) noted from the studies of Nguyen et al. (2015) and Coyne & McCoy(2020) that compared with other sectors, change processes in the educational context tend to be slower and more incremental, and the emerging technologies seem not fully integrated into current pedagogical methodologies in a holistic way. "Many teachers turn to use technologies to maintain their current pedagogical goals more efficiently or even merely provide learning content digitally, rather than adopting appropriate strategies to apply tablets in teaching practices or enhance learner-centered approaches (Montrieux et al., 2015; Roblin et al., 2018). The utilization in certain circumstances does not fit the students' expectations (Semerci, 2018)" (p.2). The proper strategy to align tablets within the academic programs and workflows also remains to be specified (Nguyen et al., 2015). Lecturers might lack knowledge on effectively utilizing tablet devices in teaching or may not fully recognize their potential for educational purposes, particularly in the absence of favorable conditions like supportive institutional policies and adequate understanding of tablet integration with course materials (Zhang, 2022). This issue was also observed in the study conducted by Rikala et al (2013), which indicated that the actual usefulness of tablets in schools was significantly less than what teachers perceived as the pedagogical potential.

The observation was seen in the study by

Tamim et al. (2015) on the large-scale government-funded tablets program, which revealed that most of these initiatives were driven by tablet hype instead of educational frameworks or research-based evidence.

While some tablet adoptions did not fully yield the desired results, the significance and impact of using tablets for mobile learning, especially during the pandemic, is also very clear. The essential features, such as their ubiquity, portability, lightweight, and low cost (Lang & Šorgo, 2023; Ndou et al., 2024; Yeap et al., 2016), make tablets easy for students, their parents, the schools, or the government to purchase and invest in to ensure learning continuity during difficult times.

In the Philippines, several local governments also adopted tablet use when face-to-face classes were suspended during the COVID-19 pandemic. In Quezon City, the local government procured and distributed more than 300,000 tablets to grades 4 to 12 students from 2020 to 2023, along with internet connectivity and laptops for teachers (Quezon City Government, 2021). This learning continuity investment is by far the biggest among all other local governments in the country. Given the situation during the pandemic, there is no doubt that such provisions greatly benefited both students and teachers. However, no empirical study has yet been conducted to determine the extent of tablet utilization and the student's perception of mobile learning, which this paper hopes to achieve.

Research Objectives and Research Questions

This study aimed to determine if the supposed benefits of using tablets in education were observed in the Quezon City government's tablet program. In particular, it will study senior high school students' usage and perceptions of the usefulness of tablets in learning.

The study will also compare the tablet utilization of students in a science high school, a mega-school, and other regular public schools. A science high school is a specialized school that accepts only students with above-average abilities who have shown an aptitude for science and technology. Classes in science high school are conducted in single-shift, full face-to-face classes immediately after the pandemic. A mega school has a student population of more than 17,000 and adopts a double-shift and blended learning approach even after the pandemic due to congestion and lack of classrooms. Other regular high schools pertain to all other schools in the

city that adopt single or double shifts, face-to-face or blended learning, depending on their location and population.

To achieve these objectives, the study will address the following research questions:

1. How do students feel about the free use of tablet programs by the Quezon City Local Government?
2. How do students in senior high schools utilize the tablets issued to them?
3. How do students in senior high schools perceive the tablet's usefulness in their learning?
4. Is there a difference in the extent of utilization and perception of tablets between senior high school students in a science high school, a mega-sized regular high school, and other regular public schools?
5. Is there a correlation between the type of school and the students' extent of use and perception of tablets?

Significance of the Study

Examining the students' extent of use and their perceptions of the tablets in their distance learning education will contribute to the following:

To the Quezon City LGU, this study may serve as a report or feedback on the effectiveness of their investment in basic education during the COVID-19 pandemic and as basis for the possible roll-out of the tablet program.

To the Department of Education, this study may serve as a basis for future decisions on using tablets for distance learning.

To future researchers, this research aims to add to the existing body of knowledge on the use of technology, particularly mobile learning and tablet computers in basic education. Future researchers may explore other factors and variables in analyzing the effectiveness of mobile technology or tablet computers in education delivery.

Scope and Limitation of the Study

This study covers only senior high schools (Grades 11 and 12) out of the 9 grade levels (Grades 4 to 12). Among all grade levels, senior high schools were the early recipients of the program. It also does not include the perceptions of teachers or management who may have influenced the distribution and use of tablets in schools.

The constructs analyzed in this study cover only usage and perception, which is a deviation from the more popularly used Theory Acceptance Model (TAM) by Davis (1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al. (2003) their variations. Since the tablets were given issues for free to the students, TAM and UTAUT frameworks were deemed not applicable. TAM and UTAUT were observed to have placed more emphasis on the factors that drive user decisions concerning the acceptance or rejection of the technology, which seek to explain the individual user's initial intentions (Aggarwal et al., 2015). Zamani et al. (2022) explained that because these theories emphasize the preliminary stages of user interaction, less or no emphasis is given to how users use the technology, which exerts a greater impact on its viability.

There seems to be no established framework yet for evaluating government-led initiatives such as this free tablet program. Thus, this paper adopts the analysis of Narayan & Naidu, (2020), which focused only on two constructs—Usage or Practice and Perception towards tablet computers. Usage/ Practice measures how often the students use their tablet computers on the various learning materials, tools, and apps, while perception toward tablets pertains to the students' reflections on their experience. These constructs are found to be most compatible with the study of the tablet program.

2. METHODOLOGY

2.1 Research Design

This quantitative, descriptive research used the convenience sampling method to collect primary data from the target population. Using the online Raosoft sample size calculator, at a 95% confidence level and 50% estimated response distribution, a sample size of 380 was computed from the 33,944 senior high school students for the 1st semester of SY 2022-2023. Understanding that some of the respondents may be minors, the online questionnaire was distributed through the Assistant Schools Division Superintendent and the School Heads, who may or may not allow the distribution of the survey instrument. The instrument also has an informed consent part where they are asked to signify whether they consent before proceeding with the questionnaire and an opt-out portion anytime during the survey. A total of 1,477 students participated in the survey, of

which only 1,355 responses were included after data cleaning. This represents 356% of the required sample size.

2.2 Research Instrument

The online survey questionnaire was adopted from the study of Narayan & Naidu (2020), with some of the questions modified to reflect the actual situation of the research participants. The questionnaire was said to have been impartially reviewed for content validity with the Laucala Campus faculty and students. The reliability test result was 0.94 Cronbach's α , indicating an excellent level of agreement between the items. During the data analysis, some questions that have negative and very low item-rest correlations with the studied constructs were removed, leaving only 14 items for usage and 14 for perception.

2.3 Statistical Treatment of Data

The data gathered from survey results were reviewed, cleaned, coded, and analyzed using Jamovi, statistical software. Descriptive analysis was used to get the statistical results for the demographic and other categorical questions. Inferential analysis was used to determine if there is a significant connection or relationship between the type of schools and the utilization and perception.

3. RESULTS AND DISCUSSION

The majority of the respondents are female (58.5%) out of the total 1,355 respondents as shown in Table 1. While the respondents' ages range from 16 to 23, most are 18 and 17 years old, accounting for 36.8% and 32.8%, respectively. As to grade levels, most respondents come from Grade 12, representing 60.1% of the total. As to school type, other regular high schools have the highest participation at 749, followed by the mega school, then the science high school.

Table 1. Profile of Respondents

Variables		F	% of Total	Cumulative %
Gender	Male	562	41.5 %	41.5 %
	Female	793	58.5 %	100.0 %
Age	16	142	10.5 %	10.5 %
	17	445	32.8 %	43.3 %
	18	499	36.8 %	80.1 %
	19	153	11.3 %	91.4 %

Variables		F	% of Total	Cumulative %
20		64	4.7 %	96.2 %
21		29	2.1 %	98.3 %
22		15	1.1 %	99.4 %
23		8	0.6 %	100.0 %
Grade Level	Grade 11	541	39.9 %	39.9 %
	Grade 12	814	60.1 %	100.0 %
Type of School	Science	247	18.2 %	18.2 %
	Regular - Mega School	359	26.5 %	44.7 %
	Regular - Others	749	55.3 %	100.0 %

In terms of length of use, Table 2 shows that 38.7% of the respondents had just recently received tablets with less than one year of tablet use at the time of the survey. Only 26.1% of the respondents have used it for over two years.

Table 2. - Length of Tablet Use

	F	% of Total	Cumulative %
Less than 1 year	525	38.7 %	38.7 %
1 to 2 years	477	35.2 %	73.9 %
More than 2 years	353	26.1 %	100.0 %

Fig. 1 shows that 58% of the respondents have received and used the tablets in the mega school only in less than a year. Only 19% of the respondents from the mega school have used the tablet for more than two years. For science high school, 47% have used it for over two years, and 41% within 1 to 2 years.

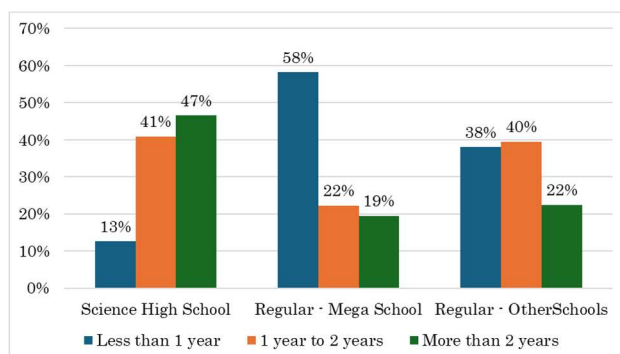


Fig. 1 - Length of Tablet Use per Type of School

Figure 2 shows that students from regular schools use tablets more frequently than those from science high school. It is worth noting that 28% of students from science high schools responded that

they use the tablet only sometimes, and 18% of them rarely use it.

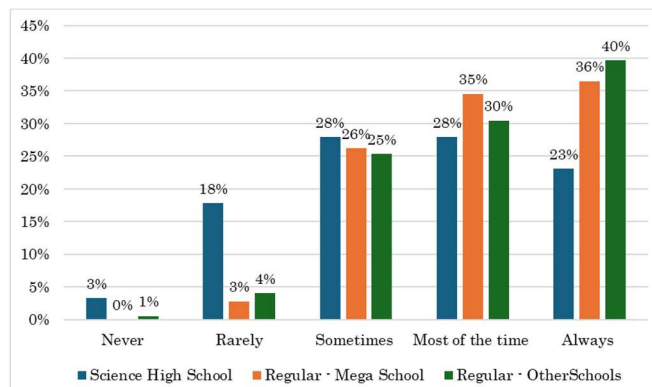


Fig. 2 - Frequency of Tablet Use per Type of School
The subsequent discussions will present the answers to the research questions.

1. How do students feel about the free use of tablet programs by the Quezon City Local Government?

Table 3 shows that the students are happy (4.43 mean) with the free tablets from the LGU. The same table also showed a mean of 4.02 for comfort level, meaning that most students are comfortable with the use of the device for learning.

Table 3. Feelings and level of comfort with using tablet computers

	How do you feel about receiving a free Tablet?	How comfortable are you with using tablet computers?
N	1,355	1,355
Mean	4.49	4.02
Median	5	4
Standard deviation	0.755	0.811
Note: Feelings: 1 - Not at all happy; 2 - Not very happy; 3 - Neutral 4 - Somewhat happy; 5 - Very happy Comfort level: 1 - Not comfortable; 2 - Slightly comfortable; 3 - Moderately comfortable; 4 - Comfortable; 5 - Very comfortable		

A look at the students' responses per school type (Fig. 3) reveals that students from the regular and mega schools are highly appreciative, with 67% and 64% responding that they were very happy, while the science high school registered only 55%. Despite being freely given, 2% from the mega school and 1% from other regular high schools are not happy with it.

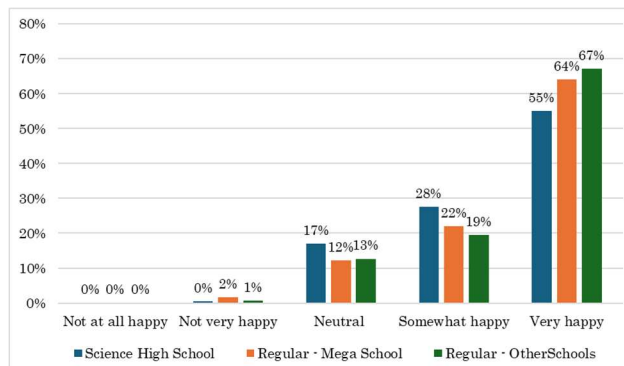


Fig. 3 - Feelings for Receiving the Tablet

Students from the mega school and other regular high schools also register higher levels of comfort than the science high school, with 30% and 28% responding very comfortable, and 51% and 53% responding comfortable, respectively.

As the figures show, despite the students from both regular schools later receiving tablets (Fig. 1), they register a higher frequency of using the tablet (Fig. 2), are happier (Fig. 3), and are more comfortable (Fig. 4) with using the tablets compared to the students from the science high school.

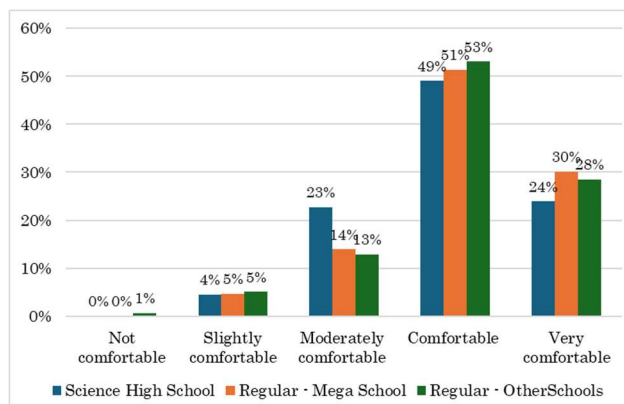


Fig. 4 - Level of Comfort with Tablet Use

2. How do students in senior high schools utilize the tablets issued to them?

The student's tablet utilization is summarized in Figure 5 arranged based on their mean scores. The top 5 responses include 1) Completing an assignment, 2) Participating in discussions on Google Classroom /Google Meet, 3) Using internet search engines to find information relating to the class, 4) Reading prescribed lessons (ex. PowerPoint, e-

textbooks, unit readings, etc.), and 5) Checking assignment grades.

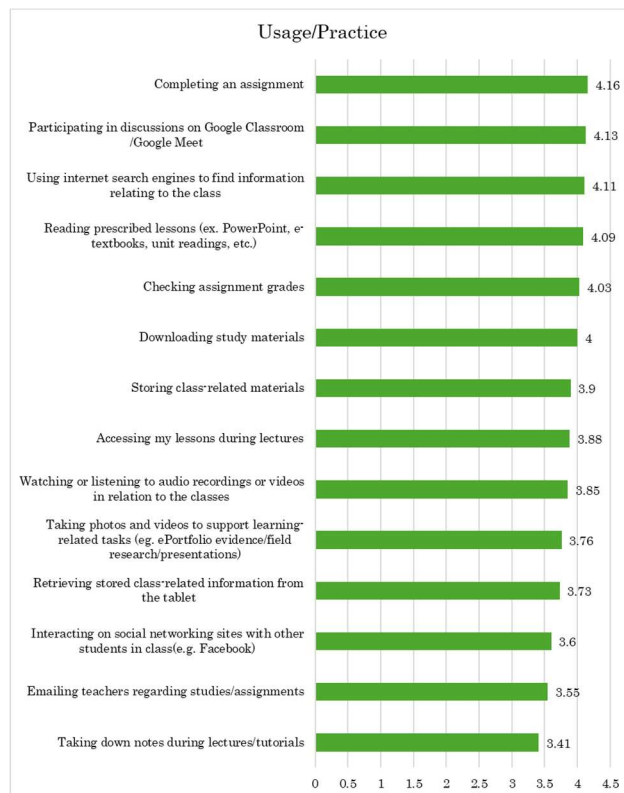


Fig. 5 - Usage/Practice of Tablets

An overall mean score of 3.87 for the Usage/Practice as shown in Table 4 indicates that the students are putting into good use the tablets issued to them by the government.

Table 4. Analysis on the Extent of Use and Perception

	Usage	Perception
N	1355	1355
Mean	3.87	3.92
Median	4.00	4.00
Standard deviation	0.857	0.753

Note: Usage: 1 - Never; 2 - Seldom; 3 - Sometimes; 4 - Often; 5 - Almost Always
Perception: 1 - Strongly Disagree; 2 - Disagree; 3 - Undecided/N/A; 4 - Agree; 5 -Strongly Agree

3. How do students in senior high school perceive the tablets' usefulness in their learning?

Figure No. 6 summarizes the students' responses to this research question. The top 5 responses include 1) I find learning with a tablet very helpful, 2) the tablet allows for flexible access to online resources for my assignments, 3) the tablet helps me do my assignments effectively, 4) the tablet helps me in my research, and 5) the tablet allows me the flexibility to learn anytime, anywhere.

The mean score of 3.92 for perception (Table 4) indicates the students find the tablets useful for their learning, which strengthens previous studies' view that tablets can support students, teachers, and schools' learning programs.



Fig. 6. Perception Towards Tablets

4. *Is there a difference in the extent of utilization and perception of tablets between senior high school students in a science high school, a mega-sized regular high school, and other regular public schools?*

Table 5 summarizes the students' extent of utilization and perception concerning the use of tablets per type of school. In usage, the regular-mega school registered the highest mean at 3.99, followed by

other regular schools at 3.98, while the science high school registered the lowest mean of only 3.38. This means that the students from the science high school have not fully maximized the use of the tablet. This may be attributable to the fact that the science high school was already doing face-to-face classes when the survey was made, while the mega school continues to operate on blended learning. Some regular high schools also use blended learning due to classroom congestion.

On the students' perception of the usefulness of tablets for learning, the regular mega school and other regular high schools registered the highest mean at 3.99. Their responses signify that they agree with the listed perceived benefits of using tablets. Similar to usage, the students from the science high school registered a lower mean compared to the regular schools at only 3.61. This suggests that science high school students are not as convinced about the benefits of using tablets in learning.

Table 5. Comparison of the Students' Usage and Perception of Tablets

	Type of School	Usage	Perception
N	Science	247	247
	Regular - Mega	359	359
	Regular - Other	749	749
Mean	Science	3.38	3.61
	Regular - Mega	3.99	3.99
	Regular - Other	3.98	3.99
Median	Science	3.50	3.71
	Regular - Mega	4.07	4.00
	Regular - Other	4.07	4.07
SD	Science	1.07	0.838
	Regular - Mega	0.741	0.670
	Regular - Other	0.770	0.736

Note: Usage: 1 - Never; 2 - Seldom; 3 - Sometimes; 4 - Often; 5 - Almost Always
Perception: 1 - Strongly Disagree; 2 - Disagree; 3 - Undecided/Not applicable/ 4 - Agree; 5 - Strongly Agree

The results show that even though students from the science high schools are more advanced academically because of the stringent entry process to the school and are deemed to be more adept in the use of technology, it did not translate into mobile learning adoption, as seen in their extent of use and perception level.

As discussed earlier, the mega school has the highest student population among all schools in Quezon City and has continued the blended learning modality after the pandemic. This most likely explains

their higher extent of utilization and perception of the use of tablets for learning compared to the science high school and other regular schools.

5. Is there a correlation between the type of school and the students' extent of use and perception of tablets?

The correlation test shown in Table 6 shows positive and significant correlations between the type of school and the Usage and Perceptions at 0.170 and 0.137 Spearman's rho coefficient, respectively. This means that the extent of utilization and the perception of the usefulness of tablets in learning is directly related to the type of school.

The correlation between Usage and Perception is even higher at 0.760, indicating a very strong positive correlation between the two variables. This means that the students' perception of the tablet as a useful tool for their learning is highly dependent on the extent of utilization. With a p-value equivalent to $<.001$, the result shows that these are statistically significant.

Table 6. Correlation Matrix

		Type of School	Usage	Perception
Type of School	Spearman's rho	—	—	
	p-value	—	—	
	N	—	—	
Usage	Spearman's rho	0.170***	—	
	p-value	$<.001$	—	
	N	1355	—	
Perception	Spearman's rho	0.137***	0.760***	—
	p-value	$<.001$	$<.001$	—
	N	1355	1355	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Overall, the results underscored the students' effective use of the tablets provided by the local government and their high perception of the tablets' usefulness in the learning process. This finding echoes the research of Narayan & Naidu (2020), where students expressed a positive perception of this initiative, indicating that the tablets significantly enhanced their engagement with their studies. This reiterates the belief that when provided with tablets, contemporary students can effectively utilize them to bolster their learning.

4. CONCLUSIONS

The purpose of the study was to determine whether the free tablet program provided by the Quezon City government has a positive impact on the students and their learning process. The result showed that tablet utilization is high for learning activities such as completing and checking assignments, participating in online classes, information searches, and reading. Overall, the students perceived the tablet as beneficial for their learning, especially those in the mega school and other regular high schools.

The study also showed that there is a high positive correlation between the usage of the tablet and their perception on tablets as educational technology and as a tool for distance and traditional learning methods. As evidenced in this study, the benefit of mobile learning was observed more in those who are doing distance (blended) learning but lower in those taking face-to-face classes despite them being deemed more adept in science and technology. A study on how to maximize the use of issued tablets for face-to-face learning may be necessary.

The review of previous literature indicated that countries that first adopted the use of tablets for learning did not achieve their expected results and suggested that for optimum benefit, the adoption of the device should be accompanied by relevant improvements in the teaching content and methodologies and capacity building of teachers and students in its adoption.

Thus, if the project of the Quezon City local government will be rolled out and adopted as a tool for learning instead of just a learning loss mitigation strategy, the results of the studies from other countries should be considered, and a more holistic approach is recommended. These are 1) ensure that tablet use is included in the pedagogical content and methodologies, 2) train teachers on the use and potential of tablets as a learning tool, and 3) conduct a thorough orientation and training of students on the use and potential and the learning activities they can do with the tablet before distribution.

Directions for Future Research

To get a more holistic perspective of the tablet implementation's results, the study may be expanded to cover the extent of use and perceptions of students from junior high schools and elementary schools.

Future studies should include teacher perceptions of tablet use and also a study on how they incorporate tablet use in their lessons. Previous studies indicate that teachers contribute to less adoption of the technologies presented to students because of their lack of knowledge and skills. Therefore, it is recommended that future studies focus on teachers to determine factors that would encourage them to champion the use of technology in the classroom.

Another recommendation is to develop a framework for analyzing government-led initiatives such as the large-scale procurement and distribution of tablets or any applicable technologies in the future. This framework would complement the existing frameworks, which mostly apply to business settings.

5. ACKNOWLEDGMENT

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