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MOBILE TECHNOLOGY: MODEL TOWARDS THE ACHIEVEMENT IN BIOLOGY OF GRADE 8 LEARNERS

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ABSTRACT

This study was conducted to see how Mobile Technology affects the achievement of Grade 8 Learners in Biology. The study employs the Student-led, teacher-led, and collaborative (STC) model in the learning process. The model also places emphasis on the importance of the presence of all three in all classrooms adopting mobile technology to promote better mastery of course content. The goal of the researcher is to know the status of mobile functions if it was extent in the classes especially during in this time of pandemic, the mean performances of the learners before and after using the mobile functions and their level of interest on Biology using these mobile functions. This quasi-experimental study aimed to determine all of those that have mentioned. The mobile technologies are used to see the difference in the mean performances of the learners before and after using mobile functions. In order to gather data, the researcher crafted a pre-test and post-test to determine the mean performance of the learners before and after being administered with mobile functions. There are three groups of learners in the experiment: one which will use the student-led mobile functions, one which will use the teacher-led mobile functions, and one which will use collaborative mobile functions. The learners will be grouped based on their average grades in Science 8. The experiment was conducted beginning the 4th quarter of the school year according to the MELC given by the Department of Education on this time of pandemic. Based on the analyses conducted, it is concluded that the mobile functions were utilized to their fullest extent in the three sets of participants, the mean performance of the students also improved greatly, there is a significant difference between the mean performance of the learners before and after using the mobile functions, there is a significant difference between the mean performance of the learners after using the mobile function, and the level of interest of the learners greatly improved after using mobile functions in their classes.

INDEX TERMS- ***Mobile technology, mobile functions, student-led, teacher-led, collaborative, usage, interest….***

1 INTRODUCTION

Understanding the relationship between learners' learning outcomes and the pedagogical features of mobile devices in the classroom is essential because of the integration of technology in most classrooms [1]. Moreover, they also stated that teachers has used mobile devices in many of the tasks they traditionally did without them such as preparation of their lessons, grading papers, and submission of learner tasks, among others. However, it's not only the teachers who sees mobile devices as an effective tool in the learning process as learners also use mobile devices in activities learners traditionally did without them [1]

Meanwhile, the current COVID-19 pandemic has posed numerous challenges to various industries. The limitations on mobility amidst the pandemic has also become a problem in the education sector.

However, there is very little research on the real-life impacts of mobile technology in the classroom here in the Philippines, especially amidst pandemics such as the one the world is experiencing at present. Focusing on the situation we are currently facing, this study will help teachers who are not really into technology, giving those options to use during their online classes. Especially, that on the next school year, face-to-face learning will still not be possible. Making a classroom setup during online classes should be easy and not complicated for both the learners and the teachers while in this pandemic.

2 STATEMENT OF THE PROBLEM

This study will examine how the usage of mobile technology affect the academic performance and level of interest of grade 8 science learners.

More specifically, this study aims to do the following:

1. What is the status of mobile functions used by the learners in terms of:
   a. Student-led; b.Teacher-led; and c. Collaborative?
2. What is the learners' level of interest after using mobile function?
3. What is the mean performance of the learners before and after using the mobile functions?
4. Is there a significant difference in the mean performance of the learners before and after using mobile function?
5. Is there a significant difference between the mean performance of the learner after using the mobile function?

3. METHODOLOGY

This study is quasi-experimental in nature. It includes a pre-test and a post-test to determine the impact of the usage of mobile devices in the learning achievement and interest of grade 8 science learners. The mode of presentation of data is descriptive.

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Necessary permit to conduct the research was secured first. A letter of approval was sought from the office of the Dean of the College of Teacher Education to allow the researcher to conduct the study. Research problem was formulated and constructed. The findings of pertinent information and related studies from the library and surfing from the net were collected for justification. Then, the first draft of the papers made and submitted to the research adviser for revision and correction of data. The letter of approval to conduct the study in the school of Paaralang Sekundarya ng Lucban Intergrated School, to the office of the principal, and in the Division of Quezon for Data privacy act was then secured. The researcher constructed the initial draft of the questionnaire for further validation of reliability. Afterwards the final reproduction of the questionnaire was then prepared and the respondents answered the pre - test after which the conduct of studies was scheduled. A compressed two – week online classes was rendered to monitor the mobile functions depending on the availability of students. The program will be used in the selected classes: one which will use the student-led mobile functions (Section Ilang-Ilang with 11 boys and 9 girls), one which will use the teacher-led mobile functions (Section Dahlia with 15 boys and 5 girls), and one which will use collaborative mobile functions (Section Cattleya with 9 boys and 11 girls). The learners in each of the group belong to students with average grades of 80-89. A post – test was also administered through google forms and sending the picture of their answers for those learner with limited connection, in order to get the final result.

After conducting the survey proper, the researcher analyzed the result and examined whether there where parts to improve, revise, change, and put comprehensible information to make the material more instructive. During the revision of the material, the researcher double checked the pertinent data in mobile functions which was need to correct or modify. Then, the final output was designed. The transcription of the questionnaire and analysis were interpreted using the quasi-experimental method.

4. LITERATURE REVIEW

The 21st century classroom is a classroom where the learning of the 4Cs of Education are fostered and emphasized. The 4Cs of Education include Communication, Collaboration, Critical Thinking, and Creativity. Since the 21st century classroom encourage learners to learn their lessons in an inductive manner, educators become facilitators instead of authorities in the topics they teach [2]. In this sense, teachers must allow learners of the 21st century classroom leeway and control in their learning.

According to [2], in order to develop the communication skills of learners, teachers answer one of the most important question in the learners' minds: "Why is it important that I learn this? Why now?"

[3] Stated that working with others is an important skill in the 21st century. In this sense, being able to share ideas and knowledge is seen as a very attractive trait in prospective employees and workers.

In terms of creativity, [2] stated that teachers must design creative activities that will help learners meet the demands of unstructured problems in the outside world while they work with new information. Furthermore, teachers must allow learners to falter in order to train their resilience.

On the part of the teachers, 21st century teachers are also expected to be adaptable to any situation based on the needs of their learners [3]. Finally, critical thinking is important to 21st century learners as they are expected to analyze diverse sets of information in their own fields. [2] Defined critical thinking as "examining problems in new ways and linking information to possible solutions."

According to [4], a critical thinker will be able to think broadly about particular problems in order to craft a solution that fits the needs of today's classroom, at the most specific, and the world, at large.

On the other hand, [3] stated that teachers of the 21st century classroom are expected to be masters of technology. This is because it is generally assumed that "technology in the classroom, whether it's for lessons, assignments, or grading, can help students learn better and faster." It also helps teachers manage their time more efficiently.

[5] Further laid out the most defining characteristics of a 21st century teacher. These are: learner-centered classroom and personalized instruction, student as producers, learn new technologies, go global, be smart and use smartphones, blog, go digital, collaborate, use Twitter chats, Connect, Project-based learning, build your positive digital, code, innovate, keep learning

These characteristics may be considered a soft standard for how 21st Century teachers conduct their classes and how they adapt to the ever-changing needs of 21st Century learners in the 21st Century classroom.

Academic performance

[6] Defined academic performance as the extent to which learners in particular education institutions accomplished specific learning goals in the courses they take.

According to [7] the notion of measuring one's academic achievement or performance in school has been in place in the United States of America since the 1830s and has solidified in practice through one of the fathers of the American Education system, James Bryant Conant, who was appointed president of the Harvard College in 1933.

However, despite the narrow conception of academic performance in the traditional sense, many authors have tried to explain how it relates to the actual conduct of teachers in the classroom. For example, [9] states that academic performance is measured continuously over a period of time, using various kinds of assessments, both qualitatively- and quantitatively-oriented.

In support of this,[10] stated that academic performance is a learner behavior that could be observed based on scores they obtain in class exercises, tests, and mock examinations, among others.

The general understanding of academic performance in these literatures seem to relate to numerical expressions of achievement of learning goals based on standardized tests[10]. As such, this study takes these inputs from existing resources and operationalize the idea of academic performance as the achievement of learning outcomes from the beginning to the end of the quarter based on the scores of Science 8 learners.

Most Essential Learning Competencies (MELCs)

According [11], 87 percent or approximately 1.5 billion learners around the world have been affected by the closure of public and private education institutions brought about by the COVID-19 pandemic. The pandemic has marked the world as a very uncertain place to be in at present. In order to make things easier for both teachers and learners to tackle the challenges of interim distance and remote learning, the Department of Education (DepEd, 2020a) released the Most Essential Learning Competencies (MELCs) and the Guidelines on the Use of the MELCs.

MELCs are defined as the competencies most needed by the learners to continue on with education and to have a better life in the future (DepEd, 2020b). The MELCs are further characterized as (1) based on the national standards such as 'holistic Filipino learners with 21st Century skills'; (2) connecting content to high order concepts across content areas; (3) applicable to real-life situations; (4) remains relevant to learner's life even if they drop out of school; and (5) exclusively learned in schools.

As such, the MELCs will allow for sustainable and continued learning for the Filipino youth even during crisis situations such as the COVID-19 pandemic. The MELCs are also designed to respond to chal-

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lenges in learning delivery (DepEd, 2020a), a characteristic that's essential, especially at present.

The MELCs were selected and the guidelines created by the Bureau of Curriculum Development – Curriculum Standards Development Division in collaboration with the Assessment Curriculum and Technology Research Center (ACTRC) starting 2019 as part of its continuing review of the K-12 curriculum (DepEd, 2020a). As such, the development of the MELCs guidelines became a very important aspect of the role DepEd played in the transition of the country to the New Normal.

In Grade 8 Science, DepEd was able to identify 31 most essential learning competencies in its four quarters—9 in the first quarter, 7 in the second, 4 in the third, and 11 in the fourth (DepEd, 2020c). For this study, the researcher only focused on three MELCs for weeks 1 and 2 of the fourth quarter.

The first topic is *The Digestive System/Nutrition and Wellness* with the following MELCs: explain ingestion, absorption, assimilation, and excretion. The second topic is *Cellular Reproduction and Genetics* with the following MELCs: compare mitosis and meiosis, and their role in the cell division cycle and explain the significance of meiosis in maintaining the chromosome number.

Mobile Functions in Educational Settings

According to [13], mobile technology are technologies that allow users to bring certain features of smart computers wherever they go. Mobile technology may be a combination of "two-way communication devices, computing devices, and networking technology that connects them" [13].

At present, mobile technologies may be typified based on their general functions: mobile phones, notebook computers, GPS-navigation devices, and many more. The growing number of mobile technology users also seem to point towards an increased global mobile workforce by 2022 [13].

At present, mobile technologies are seen to have a multifaceted role in combatting the pandemic. According to [14], several studies have illustrated the importance of mobile technologies in contact tracing, cloud technologies in sharing and integrating big data, and the use of mobile functions in the current educational setting.

In the educational setting, especially during the pandemic, mobile technology plays an important role—that of facilitating the teaching-learning process. In informal terms, these functions may constitute the use of audio recording for teacher feedback, live polling as quiz tools, video-making as a way to stimulate the wide interest of 21st Century learners, online discussion forums to engage interest of learners even outside the classroom, and the use of QR codes [19].These functions may be categorized into more formal compartmentalization of the activities of the youth on their mobile phones based on the locus of control of these activities. As such, the student-led, teacher-led, collaborative (STC) model was created to further provide formal classification for scholarly studies.

Based on the STC model, there are five teacher-led functions: screen broadcast, picture uploading, doodling, clicker, and class test. There are also five student-led mobile functions, these are: my textbook, mindmap, class notes, build incorrect item sets, and use incorrect item sets. Finally, there are five collaborative mobile functions: screen display, use learning guide, preview learning guide, review learning guide, and my homework [1]. Further discussion on these formal classification of the mobile functions in educational settings based on scholarly studies will be provided later on.

As such, this study employs the model provided by [15] to analyze the mobile functions utilized and the frequency of utilization of learners of these functions, especially amidst the pandemic and prevailing interim education system.

5. DISCUSSION

Status of Mobile Functions

Table 1. Status of mobile functions used by the learners in terms of Student-led

Statements	WM	SD	Remarks
I use textbooks as a tool for learning and for preparation, review, and searching.	4.25	0.44	Strongly Agree
I use textbooks because it is easy to insert tags in them and highlight information.	4.15	0.37	Agree
I use mindmaps at the end of a chapter for building knowledge structure.	4.50	0.51	Strongly Agree
I use mindmaps because they can used to make notes about the topic.	4.20	0.41	Strongly Agree
I use notes after class because they are convenient storage of information.	4.50	0.51	Strongly Agree
I use notes because they can be easily modified, reorganized, tagged, and searched.	4.25	0.44	Strongly Agree
I build incorrect item sets to easily remember correct information.	4.40	0.60	Strongly Agree
I build incorrect item sets to tag and make note of incorrect information.	4.55	0.51	Strongly Agree
I use incorrect item sets to review and manage incorrect item sets.	4.35	0.49	Strongly Agree
I use incorrect item sets to highlight, mark, index, and search for correct information.	4.30	0.47	Strongly Agree
Overall Mean: SD		**4.35: 0.487**	
Verbal Interpretation		**Very High**	

Table 1 presents the status of mobile functions used by the learners in terms of student-led.

The (WM= 4.35, SD= 0.487) indicated a *very high* status of mobile functions used by the learners in terms of student-led. This could indicate that student-led mobile functions were utilized to their fullest extent in the lessons conducted by the teacher, more so building incorrect item sets, mindmaps, and textbooks. This also indicates a certain level of independence on the part of students since teachers only control content while students determine how and when they learn.

Table 2. Status of mobile functions used by the learners in terms of Teacher-led

Statements	WM	SD	Remarks
My teacher uses teacher uploading to assign subjective work to students.	4.75	0.44	Strongly Agree
My teacher uploads our work, tests, and drawings after class.	4.65	0.49	Strongly Agree
My teacher allows us to interact with the class content using doodling.	4.30	0.47	Strongly Agree
My teacher allows us to store and submit the doodles as part of my class output.	4.50	0.51	Strongly Agree
My teacher conducts polls as basis for adjustments in class content.	4.45	0.51	Strongly Agree
My teacher conducts polls using clickers or other digital means.	4.55	0.51	Strongly Agree
My teacher conducts class tests to monitor	4.40	0.50	Strongly

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our learning.			Agree
My teacher conducts class tests to statistically measure how much we have learned from the lessons.	4.60	0.50	Strongly Agree
My teacher uses screen display to presents our work on screen.	4.70	0.47	Strongly Agree
My teacher uses screen display to allow students to explain their work in class.	4.60	0.50	Strongly Agree
Overall Mean: SD	4.55: 0.499		
Verbal Interpretation	**Very High**		

The (WM=4.55, SD=0.499) indicated a *very high* status of mobile functions used by the learners in terms of teacher-led. The results presented above could indicate the active intervention of the teacher in the teaching-learning process, and this is reflected in the techniques utilized, namely: uploading, screen display, and doodling. This could also indicate that the teacher controls the pace of learning in the classroom.

The results above are consistent with the definitions provided by [16] for teacher-led pedagogy which utilizes mobile functions. According to [16], in these cases, teachers initiate, decide, and lead the use of technology in the classroom. In this case, learners have fewer leeway to control the pace of learning and are passive recipients of knowledge, the case for uploading, screen display, and doodling.

Table 3. Status of mobile functions used by the learners in terms of Collaborative

Statements	WM	SD	Remarks
I watch slides or other materials offered by my teacher in class.	4.35	0.49	Strongly Agree
I take screenshot of content presented by my teacher in class.	4.35	0.49	Strongly Agree
I learn from the screen content shared by my teacher in class.	4.75	0.44	Strongly Agree
I watch guided resources created by my teacher when I need help.	4.40	0.50	Strongly Agree
My teacher checks our learnings through tests and adjust class content based on its results.	4.75	0.44	Strongly Agree
I watch simulation experiments conducted by my teacher when I need help in the subject matter.	4.25	0.44	Strongly Agree
I use resources provided by my teacher to prepare for discussion sessions.	4.70	0.47	Strongly Agree
My teacher provides resources I can use when we have asynchronous classes.	4.90	0.31	Strongly Agree
My teacher provides feedback to my homework.	4.45	0.51	Strongly Agree
I check the homework guide provided by my teacher.	4.40	0.50	Strongly Agree
Overall Mean: SD	4.53: 0.500		
Verbal Interpretation	**Very High**		

Table 3 presents the status of mobile functions used by the learners in terms of collaborative.

The (WM=4.53, SD=0.500) indicated a very high status of mobile functions used by the learners in terms of collaborative. The results above indicate that the teacher and students are equals in the teaching-learning process as they collaborate through learning materials, screen content, tests, and simulation experiments.

The findings above are consistent with [15] who laid out the classifications of mobile functions utilized in the classroom. According to [16]., collaborative mobile functions democratize the teaching-learning process by giving students array of choices to learn. Teachers are also afforded the opportunity to utilize only a select number of mobile functions, which they think would work in the context of their unique classes.

Students' Level of Interest

Table 4. Learners' level of interest in subject matter after using mobile function in terms of student-led

Through the…	WM	SD	Verbal Interpretation
textbooks function, it was easier for me to become engaged in the lessons.	4.45	0.60	Strongly Agree
textbooks function, I greatly enjoyed the lessons of the teacher.	4.35	0.59	Strongly Agree
mindmaps function, it became easier for me to remember concepts related to the lesson.	4.50	0.51	Strongly Agree
mindmaps function, I made better notes of the concepts related to the lesson.	4.25	0.55	Strongly Agree
notes function, I participated more in the discussions.	4.50	0.51	Strongly Agree
notes function, it became easier for me to remember information related to the lesson.	4.65	0.49	Strongly Agree
building incorrect sets function, I found information that could be useful in my everyday life.	4.40	0.60	Strongly Agree
building incorrect sets function, it became easier for me to identify incorrect information.	4.60	0.50	Strongly Agree
incorrect item sets function; I learned new techniques to learn concepts faster.	4.90	0.31	Strongly Agree
incorrect item sets function, I became aware of incorrect information which I could use in decision-making.	4.45	0.60	Strongly Agree
Overall Mean: SD	4.51: 0.549		
Verbal Interpretation	**Strongly Agree**		

The weighted mean of 4.51 and with supported value of standard deviation 0.549 indicated that the students *strongly agreed* to the learners' level of interest in subject matter after using mobile function in terms of student-led that the findings are improved and better utilized during the pandemic as few privileged students opt to attend online classes and take modules as supplementary learning materials.

From the findings given above, [3] stated that teachers of the 21st century classroom are expected to be masters of technology. This is because it is generally assumed that "technology in the classroom, whether it's for lessons, assignments, or grading, can help students learn better and faster." But in this time of pandemic, students learn on their own and make their own progress, [17] also helps teachers manage their time more efficiently.

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Table 5. Learners' level of interest in subject matter after using mobile function in terms of teacher-led

Through the…	WM	SD	Verbal Interpretation
picture uploading function, it became easier for me to become engaged in the lessons.	4.40	0.50	Strongly Agree
picture uploading function, I greatly enjoyed the lessons.	4.40	0.50	Strongly Agree
doodling function, it became easier for me to remember concepts related to the lesson.	4.30	0.47	Strongly Agree
doodling function, I made better notes of the concepts related to the lesson.	4.20	0.41	Strongly Agree
polls function, I participated more in the discussions.	4.45	0.51	Strongly Agree
polls function, I became more interested in the class content.	4.60	0.50	Strongly Agree
class test function, it became easier for me to identify incorrect information.	4.20	0.62	Strongly Agree
class test function, I became more aware of how I can improve my performance in class.	4.60	0.50	Strongly Agree
screen display function, I became more interested in expressing my thoughts in class.	4.50	0.51	Strongly Agree
screen display function, I learned new techniques to learn concepts faster.	4.60	0.60	Strongly Agree
Overall Mean: SD	4.43: 0.525		
Verbal Interpretation	**Strongly Agree**		

Through the polls function, the teacher became more interested in the class content, class test function, they became more aware of how they can improve the performance in class and through the screen display function, they learned new techniques to learn concepts faster (M= 4.60, SD= 0.50, 0.60) based on the learners' level of interest in subject matter after using mobile function. Through the screen display function, they became more interested in expressing the thoughts in class (M= 4.50, SD=0.51) and through the doodling function, they made better notes of the concepts related to the lesson and class test function, it became easier for them to identify incorrect information (M=4.20, SD=0.41, 0.62).

The weighted mean of 4.43 and with supported value of standard deviation 0.525 indicated that the teachers *strongly agreed* to the learners' level of interest in subject matter after using mobile function in terms of teacher-led with the result of the findings it is because of the active-intervention given by the teacher during the online classes.

From the findings above, [2] stated that teachers must design creative activities that will help learners meet the demands of unstructured problems in the outside world while they work with new information. Furthermore, teachers must allow learners to falter in order to train their resilience.

Table 6. Learners' level of interest in subject matter after using mobile function in terms of collaborative

Through the…	WM	SD	Verbal Interpretation
slides function, I find it easier to pick up concepts discussed by the teacher.	4.45	0.51	Strongly Agree
slides function, I greatly enjoyed the lessons discussed by the teacher.	4.40	0.50	Strongly Agree
learning guide function, it became easier for me to return to topics that I find interesting.	4.70	0.47	Strongly Agree
learning guide function, it became easier for me to conduct my own experiments.	4.35	0.59	Strongly Agree
preview learning guide function, it became easier for me to prepare for class discussions.	4.50	0.61	Strongly Agree
preview learning guide function, I became more interested in participating in class discussions.	4.40	0.50	Strongly Agree
review learning guide function, it became easier for me to return to topics I find interesting.	4.60	0.60	Strongly Agree
review learning guide function, it became easier for me to prepare for class tests.	4.65	0.49	Strongly Agree
my homework function, I became more interested in finding out about my teacher's feedback on my work.	4.70	0.47	Strongly Agree
my homework function, it became easier for me to receive feedback from my teacher.	4.45	0.51	Strongly Agree
Overall Mean: SD	4.52: 0.530		
Verbal Interpretation	**Strongly Agree**		

Through the learning guide function, it became easier for them to return to topics that they find interesting and the homework function, it became more interested in finding out about the teacher's feedback on the work. The weighted mean of 4.52 and with supported value of standard deviation 0.530 indicated that the teachers *strongly agreed* to the learners' level of interest in subject matter after using mobile function in terms of collaborative which both had the opportunity to decide when and how to involve the use of mobile technology on their own.

The findings above are consistent with the findings of [17] who devised interactive mobile tools in conducting online discussions. They found that the integration of mobile functions in online discussions ensured the engagement of students in the subject matter. They also found that mobile functions greatly improved the cognitive complexity of online discussions. The findings also indicate that the mobile functions improved the engagement of the students in the subject matter. This could indicate that the integration of mobile functions has positive effects on the level of interest of students.

Table 7. Mean performance of the learners before and after using the mobile functions

Group		Lowest Score	Highest Score	Mean	SD	Verbal Interpretation
Student-Led	Pre-test	12	33	23.60	5.06	Satisfactory
	Post-test	42	50	48.05	2.84	Outstanding
Teacher-Led	Pre-test	16	33	24.00	5.24	Satisfactory
	Post-test	45	50	49.15	1.42	Outstanding
Collaborative	Pre-test	12	32	18.85	5.44	Satisfactory
	Post-test	44	50	48.20	2.09	Outstanding
Overall	Pre-test	*12*	*33*	*22.15*	*5.67*	*Satisfactory*
	Post-test	*42*	*50*	*48.47*	*2.21*	*Outstanding*

Table 7 presents the mean performance of the learners before using the mobile functions, out of 20 students, Teacher-Led received the highest pre-test result of *(M=24.00, SD=5.24)* and verbally interpreted as *Satisfactory*. This was followed by student-Led with *(M=23.60, SD=5.06)* and verbally interpreted as *Satisfactory*. On the other hand, collaborative

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received the lowest pre-test result of *(M=18.85, SD=5.44)* and verbally interpreted as *Satisfactory*.

With the overall pre-test mean result of 22.15 and supported value of standard deviation of 5.67 and the *(Lowest Score = 12, Highest Score = 33)* the mean performance of the learners before using the mobile functions has a descriptive equivalent of *Satisfactory*.

The mean performance of the learners after using the mobile functions, out of 20 students, teacher-led received the highest post-test result of *(M=49.15, SD=1.42)* and verbally interpreted as *Outstanding*. Followed by Collaborative with *(M=48.20, SD=2.09)* and verbally interpreted as *Outstanding*. While Student-Led received the lowest post-test result of *(M=48.05, SD=2.84)* and verbally interpreted as *Outstanding*.

With the overall post-test mean result of 48.47 and supported value of standard deviation of 2.21 and the *(Lowest Score = 42, Highest Score = 50)* the mean performance of the learners after using the mobile functions has a descriptive equivalent of *Outstanding*. The finding presented above confirms the previous assumption that the integration of mobile functions increases the interest of students in the subject matter, which in turn improves their performance. This also indicates that mobile functions, particularly teacher-led mobile functions, could be utilized as a learning intervention to increase the mean performance of learners.

Table 8. Difference in the mean performance of the learners before and after using mobile function

Mobile Function	Performance	t-value	critical t-value	p-value	Analysis
Student-Led	Pre-test Post-test	18.844	1.6973	0.0000	Significant
Teacher-Led	Pre-test Post-test	20.707	1.7171	0.0000	Significant
Collaborative	Pre-test Post-test	22.515	1.7109	0.0000	Significant

Table 8 presents the difference in the mean performance of the learners before and after using mobile function. The data were statistically treated using the t-test. The pre-test is paired to the post-test performance of the learners using mobile function

For student-led, the t-value of 18.844 is greater than the critical t-value of 1.6973 and supported with p-value of 0.0000, it can infer that there is difference in the mean performance of the learners before and after using mobile function in terms of Student-Led and the analysis is Significant. For teacher-led, the t-value of 20.707 is greater than the critical t-value of 1.7109 and supported with p-value of 0.0000, it can infer that there is difference in the mean performance of the learners before and after using mobile function in terms of Teacher-Led and the analysis is Significant.

For collaborative, the t-value of 22.515 is greater than the critical t-value of 1.6973 and supported with p-value of 0.0000, it can infer that there is difference in the mean performance of the learners before and after using mobile function in terms of Collaborative and the analysis is Significant.

Based on the data, it is shown that there is a significant difference in the mean performance of the learners before and after using mobile function at 0.05 level of significance. It shows that the null hypothesis stating that "*There is no significant difference in the mean performance of the learners before and after using mobile function"* is rejected, it can be inferred that there is "significant" difference between them.

Table 9. Difference between the mean performance of the learners after using the mobile function

	t-value	critical t-value	p-value	Analysis
Mobile Function	33.469	1.6649	0.0000	Significant

Table 9 presents the difference between the mean performances of the learners after using the mobile function. The data were statistically treated using the t-test. The pre-test is paired to the post-test performance of the learners using mobile function

Based on the data, it is shown that there is a significant difference between the mean performance of the learners after using the mobile function at 0.05 level of significance. It shows that the null hypothesis stating that "*There is no significant difference between the mean performance of the learners after using the mobile function"* is rejected, it can be inferred that there is "significant" difference between them.

6. CONCLUSION

This section presents the conclusions of the study based on the findings presented above.

(1)The mobile functions were utilized to their fullest extent in the classes. (2)The level of interest of the learners greatly improved after using mobile functions in their classes. (3)The mean performance of the learners greatly improved after being administered with the mobile functions.(4)There is a significant difference between the mean performance of the learners before and after using the mobile functions.(5)There is a significant difference between the mean performance of the learners after using the mobile function.

7. RECOMMENDATION

This section presents the recommendations based on the conclusions and findings presented above.

(1)It is suggested that a program incorporating mobile functions in the classroom be formulated and adapted by the Department of Education in order to maximize the results of online learning during the pandemic. (2)It is recommended that a replication of this study be conducted with a fourth group of students which shall act as the control group in order to further validate the value of mobile functions in the classroom. (3)It is suggested that a program incorporating mobile functions in the classroom be formulated and adapted by the Department of Education in order to ensure maximum learning during face-to-face learning. (4)It is recommended that further studies be conducted on the possibility of using mobile functions in other subject areas in order to come up with a more suitable plan of utilization of mobile functions in each subject area. (5)It is recommended that a replication of this study be conducted, with consideration to intervening variables such as the educational and socio-economic background of parents and families of students, parental involvement in the learning process, etc.

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