

MOBILE LEARNING DEVICE (MLD) APPLICATION “STRING” AS A TOOL IN IMPROVING PERFORMANCE IN CONCEPTS OF WAVES

Salvador John M. Magalong¹, Angela T. Dela Cruz²

¹De La Salle Santiago Zobel School, ²Signal Village National High School

¹Muntinlupa City, ²Taguig City

Philippines

john.magalong@dlszobel.edu.ph

angeladelacruz108@gmail.com

Abstract This study is focused on the effectiveness of the use of Mobile Learning Device (MLD) (by using the “String” application) to the learning outcome among the Junior Students in De La Salle Santiago Zobel School in wave concepts. This study is only limited to selected students in the Third Year Level Physics classes which is composed of one (1) section only namely: Junior I. The study will involve a total of thirty nine (39) students from Third Year Level section Junior I. The group consists of twenty three (23) male and sixteen (16) female students. The selected students are among the pioneers of the PEARL program. The program aims to directly respond to the skills development of the 21st Century Learner and is inspired by the innovative attitude of the Founder of the De La Salle school system, St John Baptist de la Salle (France, 1719). Students enrolled are going to utilize Mobile Learning Device (MLD) as a tool in the teaching and learning process. In line with the findings of the study, the researchers arrived at the following conclusions: There was a significant difference between the pre-test and post-test results using the mean scores of the students in Junior I which are 4.33 and 10.13 respectively. The data revealed in the test of the level of significance that the obtained t-value 4.276 was higher than the critical t-value 2.145 with significance level at 0.05; thus, the null hypothesis was rejected and interpreted as significant. Since the mean scores of the students of Junior I were higher in the post-test than in the pre-test, it was evidently seen that there was an improvement in the performance in concepts of waves using Mobile Learning Device application String.

Index Terms—Mobile Learning Device (MLD), String Application, Significant, Improvement.

I. INTRODUCTION

Teachers play a major role in the educational system. Their chief function is to impart knowledge to their students. To be able to do this, teachers must continuously search for better way and effective methods of teaching. They have to consider the needs of their students during the teaching and learning

process. Some of which are as follows (i) profile of students, (ii) materials available and (iii) learning styles and skills of the students in the present era.

The use of computers and similar devices in the classroom may enhance teaching and learning. The time saving features of database, spreadsheets, desktop publishing and word processing software allow teachers to organize their lessons, their classroom budgets, assessment portfolios and personal records. Teachers have always used tools to help them present the material to be learned. Some of these tools are tape recorders, movie projectors, disc player and today’s newest educational tools which include computers and interactive software (Johanson, retrieved at wiu.edu, Aug 13, 2014).

Technology has always played a major part in education, beginning with computers supporting groundbreaking research at universities. Now mobile phones and tablet computers are used by individuals of all ages for educational purposes. Recently, there are many mobile devices today that allow users to surf the internet, play games and download applications. In addition to being a great source of entertainment, mobile devices are also an excellent tool for learning and education. The iPad is one of the best devices available in the market today for mobile learning. This is a line of tablet computers designed and marketed by Apple Inc. which runs on Apple’s IOS. The first iPad was released on 2010 and the most recent iPad model was released in 2013 (retrieved at Wikipedia, Aug 13, 2014). The iPad has access to thousands of educational applications, iTunes U and a mobile browser that lets individuals connect to the endless information on the internet.

This study is focused on the effectiveness of the use of Mobile Learning Device (MLD) (by using the “String” application) to the learning outcome among the Junior Students in De La Salle Santiago Zobel School in wave concepts. This study is only limited to select students in the Third Year Level Physics classes which is composed of one (1) section only

namely: Junior I. The study will involve a total of thirty nine (39) students from Third Year Level section Junior I. The group consists of twenty three (23) male and sixteen (16) female students. The selected students are among the pioneers of the PEARL program. The program aims to directly respond to the skills development of the 21st Century Learner and is inspired by the innovative attitude of the Founder of the De La Salle school system, St John Baptist de la Salle (France, 1719). Students enrolled are going to utilize Mobile Learning Device (MLD) as a tool in the teaching and learning process.

II. PRELIMINARY INVESTIGATION

This study will specifically deal with the use of an iPad app called “String” which aims to meaningfully enhance and complement the existing grade 9 physics education. The focus of the study is to collect, analyze and provide further understanding on the effectiveness of String in teaching Waves: Types and Characteristics. This study will be beneficial to students and teachers who are interested to know the effectiveness of mobile learning devices in learning wave concept. At the end of the study, findings from this research may potentially draw more learning techniques and determine the effectiveness of “String” in teaching wave concepts among the third year level students.

Since the group pioneered the use of MLDs under the PEARL program, the researchers came up with an idea of conducting initial studies on its effectiveness in the teaching and learning process.

III. STATEMENT OF THE PROBLEM

This study intends to determine and analyze the effectiveness of the use of Mobile Learning Device (MLD) (by using the “String” application) to the learning outcome among the Junior Students in De La Salle Santiago Zobel School.

Specifically, the study will attempt to answer the following questions:

Is there a difference between the performance of the students exposed to MLD instruction in the pre-test and post-test?

What are the students’ perceptions on the use of Mobile Learning Device in the way they learn concepts in Physics?

IV. HYPOTHESIS

Ho: There is no significant difference between the performance of the students exposed to MLD instruction in the pre-test and post-test.

V. PLAN INTERVENTION

The group will be given a pre-test before the discussion to test their prior knowledge about the topic. After the pre-test, the lecture shall be given to the groups. The group will be using the “String” app and shall be guided with procedures on how to use the app and guide questions to lead them in formulating

concepts in waves. After which, the group shall be given a post-test to determine the gain in knowledge.

VI. RESEARCH METHODOLOGY

The research study was conducted in De La Salle Santiago Zobel School Third Year students. The study will involve a total of fifteen (15) students from Third Year Level which were chosen using the simple random sampling.

The group was given a pre-test before the discussion to test their prior knowledge about the topic Waves. The pretest consists of a 5-item multiple choice two tier type of test in which one question is related to the next question.

Pre-test results were analyzed to identify common errors among the students’ responses. Data will be used to determine the level of understanding the students have on the topic.

After administering and analysis of the pre-test results, the lecture was given to the group using their Mobile Learning Devices (MLDs) and the “String” app to aid them in learning wave concepts. The lecture – discussion provided a list of guidelines on how to use the “String” app as indicated in the approved lesson exemplar (See Appendix B). Blended teaching strategy was used, thus, a series of questions were presented to guide the students in formulating concepts on waves.

A post-test was given to students after the lecture to determine if there is a mean gain from their pre test scores. The students were also instructed to include a reflection statement to gather their insights after they have used the application and took the post-test.

The data obtained were organized, tallied, tabulated, analyzed and interpreted. Descriptive statistics such as mean, percentage and verbal interpretation was used to ascertain the level of perception of the student respondents. T-test of dependent means was used to determine if there is a significant difference between the pre-test scores and post-test scores.

VII. INSTRUMENT

Pre-test was administered to the respondents to test their prior knowledge on waves. The test consists of 5-item multiple choice two tier type of test on Waves following the scoring system presented below:

1A	✓	✓	x	x
1B	✓	x	✓	x
Score	3	2	0	0
LEVEL of DIFFICULTY	COMPLETE DIFFICULTY	PARTIAL DIFFICULTY	UNCORRECT	NO DIFFICULTY

A lecture was conducted after the pre-test, the group was asked to download the “String” app. After the lecture, the students were given a post-test of the same set of questions.

The pre and post-test results of the group was compared and tabulated as the reference in the determination of the effectiveness of the Use of MLD to the learning outcome of students of De La Salle Santiago Zobel School. Appendix A shows the material used in the study.

VIII. OUTCOMES AND INTERPRETATION

The study deals with the effectiveness of an iPad application “String” which basically shows the parts and characteristics of a wave. Here are the pre and post-tests results of the group under study, Junior I.

Table 1
Results of Pre-test

STUDENT No.	Pre-test Scores
1	9
2	2
3	2
4	11
5	2
6	4
7	5
8	6
9	5
10	2
11	3
12	2
13	3
14	6
15	3
MEAN	4.33

Table 1 shows the performance of the students in the pretest. It can be gleaned from the table that the students have low understanding of the topic since only one (1) student or equivalent to 7% of the group passed the pretest. The table also illustrates that the group only achieved a mean score of 4.33.

Table 2
Results of Post-test

STUDENT No.	Post-test Scores
1	12
2	14
3	15
4	8
5	3
6	8
7	10
8	6
9	6
10	12
11	15
12	15
13	9
14	14
15	5
MEAN	10.13

Table 2 shows the performance of the students in the post-test where there are eight (8) students or 53% of the group who passed the post-test and the group obtained a mean score of 10.13. This suggests that the students had a better grasps of the topic after the treatment was administered.

Table 3
Comparison of Pre-test and Post-test Results

STUDENT No.	Scores	
	Pre-test	Post-test
1	9	12
2	2	14
3	2	15
4	11	8
5	2	3
6	4	8
7	5	10
8	6	6
9	5	6
10	2	12
11	3	15
12	2	15
13	3	9
14	6	14
15	3	5
Total Score	65	152
MEAN	4.33	10.13

Shown in Table 3 are the pre-test and post-test scores of the students. It can be cited from this table that there was a significant increase in the individual scores of 8 students qualifying them to pass the test, and from 7% passers, it has gotten up to 53%. Other students also had a gain in their score but are still not able to pass the post-test and there is one student who attained a post-test score 3 points lower than his pretest score. It can also be gleaned from this table that there is a significant increase in the mean score, from 4.33 to 10.13. These mean scores revealed that after utilizing the Mobile Learning Device Application String, the students had an improved performance.

Test	N	X	df	MD	Computed tvalue	DECISION	INTERPRETATION
Pre	15	4.33	14	5.8	4.276	Reject Ho	Significant
Post	15	10.13					

The test of significance between the pre-test and the post-test results of the students is shown in Table 4. The table shows that there was a mean difference of 5.8 resulting to a computed t value of 4.276 higher than the critical t value of 2.145 with significance level at 0.05. Hence, the null hypothesis was rejected and the pretest and posttest results were significantly different.

The significant difference between the pre-test and post-test results revealed the improved performance of students in concepts of waves using Mobile Learning Device (MLD) Application String.

IX. FINDINGS AND CONCLUSION

Based on the data analyzed and interpreted by the researchers in the previous section, the following were summarized as answers to the questions raised in Section

1. The mean score of the students in the pre-test was 4.33 and only 7% of the students passed. This indicated that the students have a low understanding of the topic Waves.
2. The mean score obtained by the students in the post-test was 10.13 and the percentage of the students who passed was 53%. This shows that the students were able to give more correct answers in the post-test than in the pre-test.
3. There was a significant difference between the pre-test and post-test results using the mean scores of the students in Junior I which are 4.33 and 10.13 respectively. The data revealed in the test of the level of significance, that the obtained t-value 4.276 was higher than the critical t-value 2.145 with significance level at 0.05; thus, the null hypothesis was rejected and interpreted as significant.
4. The students perceived the use of Mobile Learning Device as a fun and cool way of learning concepts in Physics. The responses of the students showed that the instructions from the teacher were clear and the use of MLD Application String was of great help in understanding concepts of waves.

X. CONCLUSION

In line with the findings of the study, the researchers arrived at the following conclusions: There was a significant difference between the pre-test and post-test results using the mean scores of the students in Junior I which are 4.33 and 10.13 respectively. The data revealed in the test of the level of significance that the obtained t-value 4.276 was higher than the critical t-value 2.145 with significance level at 0.05; thus, the null hypothesis was rejected and interpreted as significant. Since the mean scores of the students of Junior I were higher in the post-test than in the pre-test, it was evidently seen that there was an improvement in the performance in concepts of waves using Mobile Learning Device application String.

Learning outcomes depend on the effectiveness of the use of a particular teaching strategy. The research showed that traditional method and the use of mobile learning device as an

instructional material helped a lot in the teaching learning process of the students. Likewise, applying these two teaching strategies (blended teaching strategy) may be of great help in the improvement of instruction. Non-contemporary and technology-based instructions may be used to enhance the traditional method.

XI. RECOMMENDATION

Based on the results of this study, the following recommendations were made by the researchers:

1. Utilization of such MLD Applications in Physics instructions to provide maximum involvement of the students in the learning process.
2. Conduct with other domains of learning, such as affective and psychomotor, as predictors so as to prove the greater efficiency of MLD instruction as a tool for teaching Physics.
3. Conduct with emphasis on the differences in the answers of the students in each item to further prove the greater efficiency of MLD instruction as a tool for understanding concepts in Physics.

REFERENCES

- (1) JOHANSON, J. (2012). "Teaching and Learning with Technology". Retrieved from <<http://www.wiu.edu/>> August 13, 2014.
- (2) Chalufour, Ingrid. (2008). "Learning to Teach Science: Strategies that support Teacher Practice". Education Development Center, Inc. Massachusetts.
- (3) Cutnell J. and Johnson K. (2007). "Physics 7th Ed." Southern Illinois University. John Wiley & Sons, Inc.
- (4) Orleans, A (2007). "The Condition of Secondary School Physics Education in the Philippines: Recent Developments and Remaining Challenges for Substantive Improvements". Hiroshima University, Japan. The Australian Educational Researcher.
- (5) http://www.rsc.org/images/Chandrasegaran%20final_tcm18-94351.pdf
- (6) <http://www.tused.org/internet/tused/archive/v7/i2/text/tusedv7i2a4.pdf>