Impact of the Integration of Text-Messaging in Mathematics Teaching-Learning Process

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Received: 7 June 2015 Accepted: 1 July 2015 Published: 15 July 2015

Abstract

This research study established the impact of the integration of text-messaging in Mathematics teaching-learning process. This one shot design study employed the Pre-Post Test method of investigation. After the students took the Pre-Test, the integration of text-messaging in the teaching-learning process was done for two weeks. At the end of the two-week allotment of the lesson, the students took the Post-Test and were surveyed on their attitude towards the integration of text-messaging. It was found out that the Post-Test result is higher than the Pre- Test result (Alpha 0.05). Furthermore, the students ?agreed? on the integration of text-messaging in the teaching-learning process.

Index terms— text-messaging, mathematics teaching-learning process, university of san carlos, impact study, mobile gadget.

1 Impact of the Integration of Text-Messaging in

Mathematics Teaching-Learning Process

2 I. INTRODUCTION

Since the start of the new millennium, experience and expertise in the development and delivery of mobile learning have blossomed [17]. Mobile learning through the use of wireless mobile technology allows anyone to access information and learning materials from anywhere and anytime (Ally, 2009). With this, the learners can opt to learn anytime and anywhere want, since mobile technology can be utilized to transport knowledge to the learners.

Mobile phone is one of the mobile technologies surpassed in the market nowadays. Mobile phones are affordable and are cheaper than PC's [7]. More than 90 per cent of the world's population now has access to mobile network [7]. Growth has been strongest in the developing countries [7]. For children and young people in particular, the mobile is an indispensable item to be carried at all times, and one which performs many more functions besides making calls and sending textmessages [5]. Mobiles are also used to listen to music and the radio, to play games, to take and exchange photographs and video, and surf the net [5]. Philippines mobile phones were preloaded with 387 interactive, educational videos in math, science and English [7].

The mobile phone has become a regular feature of our everyday lives [5]. Basically, a mobile phone is a long-range, portable electronic device for mobile communication [16]. In addition to the standard voice function of a telephone, current mobile phones can support many additional services such as SMS (short message service) for text-messaging, electronic mail, packet switching to access to internet, MMS (multimedia messaging service) for sending and receiving messages, rich text, photos and videos and EMS (enhanced messaging service) which allows users to integrate text, audio, pictures, video and animation [16].

Estimate 83 percent of 17 years olds across the country have a mobile phone today [15]. Since it is affordable, handy, and user friendly, several efforts have sprouted in integrating mobile phones in education [12]. Teachers remain the gatekeepers for student's access to educational opportunities afforded by technologies,

then technologies cannot and should not be ignored [8]. Most teachers want to incorporate more technology in their classroom [8]. However, they may need more support and instruction to learn how to use them effectively.

Since most students are very familiar with mobile phone, this technology can be utilized to benefit learning and to help motivate students [13]. Mr Tamariki can send lessons to the phones and students can let him know how they are going by either texting or file sharing [7]. Schools in New Zealand and a they

Author : e-mail: dolph_fu@yahoo.com program called WordWall allows students to answer questions asked by the teacher using mobile phones [7].

With all of these, the researcher had decided to conduct a research on the impact of the integration of text-messaging in his mathematics class. This study implemented text-messaging in mathematics teachinglearning process, and thus, will establish its impact on the implementation.

3 II. OBJECTIVES

This study aimed to establish the impact of the integration of text-messaging in Mathematics teachinglearning process. Specifically, this study aimed: a) To reveal the Pre-Test and Post Test results of the students before and after integrating the textmessaging in mathematics teaching-learning process, respectively; b) To establish the difference in the Pre-Test and the Post-Test results; c) Find out the students' attitude towards the integration of text-messaging in mathematics teaching-learning process; d) To establish the relationship between the students' attitude towards the integration of text-messaging in mathematics teaching-learning process and the result of the Pre-test and the Post-Test; e) To establish the difference in the students' attitude towards the integration of text-messaging in mathematics teaching-learning process according to: i. gender; ii. age; and iii. the number of times a student has an airtime load?

4 III. METHODOLOGY

This methodology employed of this research study is discussed in the subsections below:a) Research Design

This study utilized the one shot study design employing the pre-test and post-test investigation to establish the impact on the integration of textmessaging in mathematics teaching-learning process.

A quantitative approach was employed from a descriptive perspective with the demographic profile of the student-respondents. This study was conducted using survey methodology. Questionnaires and surveys are often used in educational research for collecting information that is not always directly observable [10]. A survey on the student profile on the use of text messaging, and the student-respondents' perception and attitude on the utilization of the said technologies in mathematics teaching-learning process was conducted.

A correlational approach was also employed to establish relationship between the Pre-Test and Post-Test results and the students' attitude towards the integration of text-messaging in mathematics teachinglearning process.

5 b) Sample and Settings

This study was conducted at University of San Carlos, during the second semester of the school year 2012 -2013. There were three sets of respondents in this research study. The first set of respondents were the professors of the said University handling statistics in the previous semesters. They evaluated the content of the Pre-Test whether the items met the specific objectives of the lessons. The professors made specific revisions on the test by citing the Bloom's Taxonomy in creating the table of specifications. The second set was students in a statistics class. They established the readability of the test. The revisions were made based on the questions raised by the students during the dry run. The third set of respondents is subject of this research study, the student-respondents of the researcher during the second semester of the school year 2012 -2013.

6 c) Measures

There were two sets of researcher-made instruments. The first set was a survey questionnaire which established the demographic profile of the student-respondents and their attitude towards the integration of text-messaging in mathematics teachinglearning process. The second set was the researchermade validated Pre-Test an Post-test which established the impact of the integration of text-messaging in mathematics teaching-learning process.

7 Integration of Text Messaging in Mathematics

Teaching-Learning Process -During the twoweek allotted time or six contact hours (inclusive of the administration of the Pre-Test and Post-Test, and orientation of the integration of textmessaging in the teaching learning process) to discuss the topic Normal Distribution, the teacherresearcher sent the following to the studentrespondents: 1) updates on scores in the previous quizzes, attendance, and behavior; 2) short concepts to highlight the day's lesson on Normal Distribution; 3) open-ended questions related to the day's topic; 3) short report assignment in which a student is tasked to explain the following day the answer of a certain item in the assignment; and, 4) pop-quizzes with the same questions but different values every group. Every meeting, the teacher-researcher and/or assigned students discussed the answers in the pop-quizzes. The researcher got the percentages/frequencies of responses and was subjected to tabulation and analysis with the Pre-test and the Post-Test.

8 IV. RESULTS AND DISCUSSIONS

The following findings were based on the result of the statistical and analytical analysis of various data: At 5% level of significance, 39 degree of freedoma) Demographic

Table 1 shows the average score of the students in the Pre-Test is 7.35 while their average score in the Post-Test is 11.22. As shown in the table, the computed t-value (9.392) is greater than the tabular tvalue (1.6827) which leads to the rejection of the null hypothesis. This means that there is a significant difference between the average score in the Pre-Test (7.38) and Post-Test **??**11.29). Furthermore, through the one shot design of this study, this shows that the Post-Test result is higher than the Pre-Test result, which implies further that the integration of text-messaging in the teaching-learning process of the topic Normal Distribution turned out to be effective. Table 2 shows that the respondents "agreed" on the eleven statements, asking their attitude, in the survey questionnaire. As shown in the table, the over-all weighted mean is 3.85, which means that the students "agreed" on the integration of text-messaging in mathematics teaching learning process. This supports the educational research and theory which suggested that students learn better when they are actively engaged in learning rather than passive recipients of the information [12]. Through exchange of text-messaging with their professors, the students had independently interacted with the professor about the lesson. Through this text-messaging, the student became interactive on the lessons and, thus agreed the integration of textmessaging in mathematics teaching learning process.

9 c) Students' Attitude on the Integration of Text-Messaging in Mathematics Teaching-Learning Process

In addition, these findings served as the platform of a study who quoted that mobile learning can provide good support to micro-learning, a new and effective way of learning [11]. Also, it revealed that people can learn more effectively if "information" is broken down into smaller, more easy-to-comprehend units [11]. There they suggested that mobile learning is an ideal medium simply because it supports this "new way" of learning via the use of SMS (short messaging service). Table 4 shows the attitude of the male and the female students on the integration of text-messaging in mathematics teaching-learning process. As reflected in the table, both the male (with a weighted mean of 3.83) and the female (with a weighted mean of 3.87) students "agreed" on the integration of text-messaging in mathematics teaching-learning process. Using the chisquare to test its difference, the computed value (6.579) is less than the tabular value (9.488), which leads to the acceptance of the null hypothesis. This means that the attitude of the male and the female students are "the same".

10 d) Correlation Between the Pre-Test, Post-Test and the Students' Attitude Towards the Integration of Text-Messaging in Mathematics Teaching Learning Process

These findings have a bearing to the study which revealed that 23.57% students strongly agree that mobile learning can be an effective method of learning as it can give immediate support [11]. Then, 39.2% of the students felt that mobile learning will be more flexible method of learning as it can be done anytime anywhere. Likewise, a study revealed that majority of the students supported the idea that the wireless networks increase flexibility of access to resources of learning independently in any place [1]. Therefore, students can save their time, effort and even money. Other researchers found out this finding in their studies:

Year 2015 "students favoured using mobile devices in the process of learning". With this, it was recommended to extensively study methods and techniques of providing knowledge via modern technological tools [3].

11 f) Difference in the Students' Attitude Towards the Integration of Text-Messaging in Mathematics Teaching-Learning

Process, According to Age At 5% level of significance, 4 degrees of freedom Table 5 shows the attitude of the students which are grouped according to age: a) sixteen (**??**6) years old; b) seventeen (**??**7) years old; and c) eighteen to twenty years old. As shown in this ANOVA table, the computed value (0.0275) is less than the tabular value **??**3.24). This leads to the acceptance of the null hypothesis. It implies that the attitude of the three groups of students according to age is "the same".

Along these findings is the study who made a conclusion that SMS text-messaging provided the most appropriate technology to address issues to support students in distant displacements and reduce the feeling of isolation while on practice **??**18]. In line with this, a study focused on using SMS for answering "short words-answers types of questions and evaluating them using simple matching process, providing enough feedback. The results proved that SMS can be used as an aid for answering short-answered type of questions [3]. At 5% level of significance, 4 degrees of freedom

Table 5 shows the attitude of the students which are grouped according to the number of times they have airtime load: a) everyday; b) once/twice/thrice a week; and c) once a month or if needed. As shown in this ANOVA table, the computed value (0.2106) is less than the tabular value **??**3.24). This leads to the acceptance

of the null hypothesis. It implies that the attitude of the three groups of students according to the number of times they have airtime load is "the same".

These findings sustain the study which aimed at evaluating the effectiveness of text messaging in an online environment, they found out that students enjoyed using text-messaging in the learning process [9]. It quoted the following statements of the students who experienced text-messaging in the learning process: interesting, cool, nice, exciting, fun, and challenging .

V. CONCLUSIONS Both male and female students agreed on the integration of the text-messaging in mathematics teaching-learning process. The degree of agreement of the male is just equivalent to the female. 6. The degree of agreement to on the integration of the text-messaging in mathematics teaching-learning process is the same across ages of the students. This implies that whatever is the age of the students, they agree to the on the integration of the textmessaging in mathematics teaching-learning process. 7. The students agreed on the integration of the textmessaging in mathematics teaching-learning process regardless on the number of times they have airtime load. The degree of agreement of the students with airtime load everyday is just the same as those students who have airtime load once a because the lessons that they learned inside the school are strengthened due to the textmessages sent by their professor.

12 VI. RECOMMENDATIONS

With reference to the findings on the attitude of the students towards the integration of text-messaging in mathematics teaching-learning process, the vast literature on the use of mobile gadget in the teachinglearning process, findings and conclusions, the researcher provides the following recommendations. Replicate this research study using a control group to compare the experimental group. 2. Develop a research study that covers the impact of on the integration of text-messaging in the classroom teaching-learning process.

13 a) To the

3. Create a strategic plan for research purpose that will serve as a springboard of the school administrators in their implementation of the integration of text-messaging in mathematics teaching-learning process.

VII. [1]

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Figure 1: 5 .

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d) Data-Gathering Procedure
This research study underwent the following data-gathering procedures:
1.

[Note: 3. Administration of the Pre-Test -The Pre-Test was administered to the student-respondents before the topic Normal Distribution was discussed to the students. After the Pre-Test, the teacherresearcher started discussing the lesson on Normal Distribution.]

Figure 2:

1

2. Aln

3. All

4. The

Profile 1. All the respondents are second year students which are new takers of the statistics course and tw
b) Difference in the Pre-Test and the Post-test Results

Test	Mean N	Std. Deviation	Mean	Std. Deviation	Paired
Pre-Test	7.3540	2.303..87		2.70	
Post-Test	11.22 40	2.21			

Figure 3: Table 1 :

2

Statements	SD	D	U	A	SA	Wx	Verbal Description
1	0	2	6	26	9	3.98	Agree
2	0	1	7	28	7	3.95	Agree
3	1	2	15	18	6	3.53	Agree
4	1	3	19	10	9	3.47	Agree
5	2	2	6	24	9	3.84	Agree
6	0	2	9	26	6	3.84	Agree
7	3	2	8	23	7	3.67	Agree
8	1	2	1	29	10	4.05	Agree
9	1	0	8	24	10	3.98	Agree
10	0	3	6	22	11	3.88	Agree
11	0	2	9	23	9	3.91	Agree
TOTAL	9	21	94	253	93	3.85	Agree

[Note: Legend: SD -Strongly Disagree; D -Disagree; U -Undecided; A -Agree; SA -Strongly Agree; Wx -Weighted Mean]

Figure 4: Table 2 :

3

N	Correlation

Figure 5: Table 3 :

3

Messaging on Mathematics Teaching-Learning Process are ”independent” from each other.

Figure 6: Table 3

4

Gender	SD	D	U	A	SA	Total	Wx			x 2 Computed Value	Tabula Value
Male	9	1	10	19	88	235	86	295	3.83	6.579	9.488
Female	9	3	6	3	63	157	57	143	3.87		
TOTAL	18	4	16	22	151	392	143	438	3.84		

At 5% level of significance, 4 degrees of freedom

Figure 7: Table 4 :

5

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	Computed	Tabular	Difference
Between Within Total	0.4156 279.4821 279.0664	2 37 39	0.2078 7.5536	0.0275	3.24	Not Significant

Figure 8: Table 5 :

5

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Squares	Computed	Tabular	Difference
Between Within Total	0.1641 14.4207 14.5848	2 37 39	0.08206 0.3897	0.2106	3.24	Not Significant

Figure 9: Table 5 :

Mathematics Teachers	d. enrichment items especially those who performed low in the quiz and those who are shy during seat work; e. congratulatory remarks to those who scored high in the exams and those who did a nice participation in the discussion; f. follow-ups on projects that are not yet submitted; g. updates on new topics; h. critical thinking problems related to the day's discussion which will be voluntarily shown by the students during the next meeting; i. "catch-d) To the Cellphone Network Stakeholders
1. Integrate text messaging in mathematics teaching-learning process. 2. Use text messaging as an "enrichment" tool only in the learning process of the students. Thus, depending too much on text messaging has to be avoided. 3. Through text messaging, send the students the following: a. updates on exam schedules and results; b. updates on class standing; c. concepts that need to be super-emphasized because of constant use;	1. Create links with publishing companies where text-messaging can be integrated in textbook production. 2. Develop a text promotion where mathematics learning of the students will be enhanced.

Figure 10:

.1 ACKNOWLEDGMENT

The researcher would like to extend his heartfelt gratitude to the persons who in one way or the other contributed to the completion of this research endeavour.

Special thanks to Rene Argenal and Dr. Ramon S. Del Fierro, Chairman of Department of Mathematics and Dean of the College of Arts and Sciences in 2012, respectively. Also, to Fr. Dionisio Miranda SVD, University President, thanks for their recognition of the output of this study through the approval of the financial assistance in presenting this research to the research conference.

My heartfelt gratitude to Dr. Craig Refugio and Ms. Marie Cris Bulay-og, whose cooperation in this endeavour is memorable. Thanks for validating the research questionnaire and the assistance during the dry run of the research questionnaire. Above all, thanks to the Heavenly Father whose divine assistance is peerless.

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