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Does Vodcasting Increase The Achievement of The Students in Trigonometry of Higher Education Institutions (HEI)?

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Abstract:
Vodcasting as a tool for teaching and learning in higher education is an approach utilizing multimedia application with remarkable potential. The study aimed to determine the effect of vodcast on the achievement in Trigonometry. It likewise tried to find out whether there was a significant difference between the mean gain scores of both groups. The subjects were students of Palompon Institute of Technology - Tabango Campus. The study utilized an experimental design to compare the learning in Trigonometry of the two groups. Data for the study were gathered by means of a standardized test designed to determine the achievement. This questionnaire was used as the pretest and posttest instruments. The difference in the scores between these tests was utilized to measure the achievement. Based from the findings, it was found out that the mean score of the pretest and posttest of both groups has increased. There was a significant difference between the pretest and posttest scores of each group. However, there was no significant difference between the mean gain scores of the two groups. The researcher concluded that both the traditional method and vodcast instruction were effective in teaching Trigonometry. It is, thus, recommended that vodcast instruction may be considered to enhance learning.

Keywords:
Trigonometry Learning, Vodcast Instruction, Experimental Design, Higher Education Institution (HEI), Tabango, Philippines

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Introduction

Quantitative Literacy as defined by Asia/Pacific Cultural Centre for UNESCO (ACCU) is a 'habit of mind' competency, and comfort in working with numerical data. It is implicit that when an individual has strong quantitative literacy skills he has the ability to reason and solve quantitative problems from a wide array of contexts. He can understand and create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, algorithms, etc., as appropriate).He is able to use his mathematical skills in dealing with situations in his life, whether it is in the complex line of business, economics, and politics or in the simple context of time reading, scheduling, and many others. Indeed, Mathematics is necessary. With such necessity, mathematics education aims, like those of other learning areas, to developed and shaped understandings and processes that are meaningful, important and useful to individuals and society. Just as knowledge expands, circumstances alter, and needs change with time, so too is the content and structure of mathematics programs adjusted and refined from time to time to reflect current needs and future visions for learners (Resnick, L. et al, 1992; Asiala, M. et al, 1997; Remillard, J. 2002). Expecting students to get right answers in the shortest possible time with the least amount of thinking is no longer a prime goal of mathematics education. For most students, a major aim is to help them develop attitudes and abilities to be flexible, creative thinkers who can cope with open-ended real-world problems. This requires them to become confident in their understanding and application of mathematical ideas, procedures and processes (National Education Monitoring Project Report, 1997).

To substantially effect the above aim, the education sector had undergone changes to improve mathematics education. Mathematical academic communities try to make changes in the area of instructional design, faculty and research to be as competitive globally in the academic training of the youth. These three aspects cannot be denied to be major factors in breaking down borders and increased collaboration as globalization asserts(Cabillan, 2007). On the development of instructional designs, technology, especially the internet reaching almost every end of the world, it is not difficult to adopt. As cited by Cabillan (2007), Miskulin of Campinas State University made an observation that “the Internet can be part of the solution to enhance Mathematics teaching in a student-centered learning environment. Alsina, as cited also by Cabillan (2007), has asserted that the classical way to deliver lectures needs to be changed, stopping the “talk and chalk” method, stopping the use of an old textbook and offering a very lively guiding program, based upon various information sources, with revised teaching notes and opening new windows to appreciate the context of the students and their creativity as individuals and as a group.

Classroom technology options have expanded from the once innovative graphing calculators and data-collection devices to include more all-inclusive software packages, graphics, video clips, digital images and more. With advanced technology, these propositions are not impossible nor are they difficult to implement. But, with the above mention facts, on the availability of advanced educational technologies for improving mathematics teaching, there seems to be opposite reality in terms of performance of students in mathematics. Evidence of this, is the TIMSS Advanced 2008 reports achievement results for students enrolled in advanced mathematics courses in the final year of secondary school in each of the participating countries including the Philippines. It addresses trends in mathematics achievement over time for participants in the previous

TIMSS assessment at this level in 1995. It reported that the Philippines, with an average scale score of 355, had the lowest average achievement (TIMSS, 2008). This means that our high school graduates have the lowest achievement among the participating countries. Another report which implies that Filipino students perform poorly in Mathematics is that of the 2003 National Achievement Test where the average grade is 44% for elementary math and 36% for secondary level. From the above results, there is strong evidence of the poor performance in mathematics of our students. This low performance of students in mathematics is not only in the international arena as shown in the above IMO results and TIMSS findings but more so in the local classroom setting. The researcher himself observed that a significant number of students in his class in Trigonometry got very low grades in this particular mathematics subject. In fact, during the second semester 2012-2013, the average grade in Trigonometry of the students was 1.85. Then in the second semester of SY 2013-2014, the average grade in Plane Trigonometry was 2.5 while in the 2nd semester of 2014-2015, the average was also low - 2.5.

On the other hand, the availability of downloadable vodcast for classroom use is admittable in our schools like Palompon Institute of Technology -Tabango Campus where the researcher is teaching. The connection of internet facilities are enough for downloads of instructional vodcast. Though some teachers use these advance technologies like Microsoft PowerPoint presentations and other computer based instructional materials, questions came into the researcher's mind on the effectiveness of the available educational videos previously mentioned if ever one wants to fully utilize these technologies. With the aim of improving mathematics performance and with the availability of internet connections and other advance technology coupled with his knowledge to use such, the researcher thought to utilize a vodcast in Trigonometry and to determine whether this vodcast would be an effective tool in teaching mathematics.

Statement of the Problem

Curriculum planners and educators who have witnessed the decay of the quality of instruction, especially in mathematics sought to find retort in the mathematics instruction. The increasing potential of vodcast instruction in the classroom scene had created dramatic effect ((Bolliger, et al, 2014; Campbell, 2005). The researchers thought to determine the effect of vodcast insruction in a mathematics course. It is needful to discover more advancement in quality of instruction among Higher Education Institutions (HEI).

Research Design of the Study

This study utilized the true experimental design, which made use of the pre- test-post test control group design as illustrated below (De Jesus, et. al. 1984). This design was chosen because this was a study that attempted to discover the effects of vodcast on the students' learning achievement in trigonometry.

R	O_1	X	O_2
R	O_3		O_4

Figure 1Pretest-Posttest Control Group Design

In Figure 1, R is the randomization process that is common to both groups. O_1 and O_2 are the pretest and posttest scores, respectively, of the vodcast group while O_3 and O_4 are the pretest and posttest scores, respectively, of the traditional group. X is the intervention which is the vodcast. The pretest was done simultaneously for both groups before the experiment started. Similarly, the posttest was given after the conduct of the experiment.

Significance of the Study

This study has national and international significance to curriculum planners and educational practitioners regarding the quality of classroom instruction in Higher Education Institutions (HEI). Practitioners in education will find the study significant considering the heightened need for global and competitive graduates. This study formed the groundwork for future advancements of quality instruction.

Method of Procedure

This quantitative study was designed to examine the relationship, between students exposed to usual classroom interaction and students exposed to the experiment. The researchers used a Cyber lecture room in teaching the traditional method and to the experimental group the Cyber laboratory room in teaching the new method/ approach utilizing the vodcast instruction. The two (2) rooms were adjacent to each other. They were geographically situated approximately 30 meters away from the PIT Tabango administration building and 80 meters away from the PIT Tabango Academic Building. Moreover, both rooms were on the same one-story building, with equal dimensions, isolated, and white-painted. In addition, the two (2) rooms were made up of concrete wall, wood trusses and corrugated roof with marine ceiling.

Viewing the two (2) rooms inside separately, the cyber lecture room was well-ventilated with curtains, 40 armchairs, one (1) multimedia projector, one (1) system unit with computer table, whiteboard, whiteboard marker, and eraser. In contrast, the other room was equipped with twenty (20) sets of computers with computer tables, Local Area Network (LAN) connection with broadband, one (1) multimedia projector, one (1) unit of air conditioner, whiteboard, whiteboard marker, and eraser. Furthermore, the ventilation of the Cyber laboratory room was covered with silver insulator for sustainability of the coolness emitted by the air conditioning system.

The Cyber lecture room was used as the venue for the traditional group which was exposed to the traditional way of teaching using white board, white board marker, and eraser. There were fifteen (15) respondents included in the group that underwent the traditional learning process using two (2) topics, namely: Topic 1- Trigonometric Identities, Topic 2 –Graphs of Trigonometric Functions. On the other hand, the Cyber laboratory room was the place where the fifteen (15) subjects belonging to the vodcast group utilized the one (1) set multimedia projector and one (1) set speaker for vodcast instruction of the same two topics tackled by the traditional group.

Collection of Data

The researchers use the universal sampling procedure, where the whole population was utilized in the study.

The researchers formally asked permission from the Campus Director of the PIT Tabango to allow him to conduct the study.

The standardized pretest was administered simultaneously to both the experimental and control groups. There were two topics that were used by the experimental and control groups, namely: Topic 1- Trigonometric Identities, Topic 2 –Graphs of Trigonometric Functions. After the pretest, the vodcast group were exposed to the vodcast group and the traditional group were exposed to the chalk and talk method of instruction. The same exercises were given in every group to test if both groups learned from their respective teaching method. The practice exercises for each module were collected and checked to determine if both groups were ready to proceed to the next topic. After the discussion of the two (2) short modules, the posttest was simultaneously administered to both groups.

Treatment of Data

Upon completion of the data gathering, the researchers employed the Arithmetic Mean to obtaining the pretest and posttest mean scores and the mean gain scores of each of the two treatment groups. T-test for two correlated samples was used to determine the significant difference between the pretest and posttest means of each group at a level of significance of 0.05. The said test was employed to find out if the control group and the experimental group gained from their respective instruction. T-test (for independent samples) was used to determine the significant difference between the mean gain scores of the two treatment groups at a level of significance of 0.05.

Findings

Examining the mean score of the pretest and posttest of both groups, it was found out that each group increased their scores and that there was a significant difference between the pretest and posttest scores of each group. Both the control and experimental groups increased in their performances and this was due to the respective methods of instructions used in each group.

Using the t-test for independent samples at 0.05 levels of significance, there was no significant difference between the mean gain scores of the two groups. Therefore, the performance of the experimental group which utilized the vodcast instruction, was equivalent to the performance of the control group which used the traditional method of teaching.

Conclusion and Implication of the Study

From the findings, it is conclusive that the vodcast instruction is just as effective as the traditional method. This finding corroborates with the finding of Bongeyet. al(2006).
From the findings, the researchers deduced that the increase in the mean scores of both the control and experimental groups is due to the respective methods used by each group and thus concludes that both the traditional and the vodcast instruction are effective in teaching Trigonometry.

The slightly lower mean gain of the group using vodcast instruction over those using traditional instruction can be attributed to the fact that vodcast instruction uses slang English dialect (as manifested by the students' feedbacks), language barrier and fast pacing of presentation,resulting to poor grasp of the students. However vodcast can provide self-paced, self-motivating and interactive learning. There was a positive evidence of gain over the traditional groups in terms of graphing trigonometric functions based on feedbacks of students, since in the vodcast presentation of the process of graphing is very

illustrative and variety of examples were presented. Vodcast instruction can be used together with traditional methods for better performance of the student.

The Higher Education Institutions (HEI) may consider provision of more computer rooms, computer units and mathematical instructional videos through internet so that mathematics instructors and students be given a better opportunity to avail of the benefits of these breakthroughs to improve the teaching-learning process in rural HEI's. Similar studies maybe conducted to all other academic subjects in the college considering various factors that may affect the performance of students exposed to vodcast instruction like computer skills, presence of the teacher, attitudes of students, and others.

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