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REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

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BOOKS

- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
- Hunker, H.L. and A.J. Wright (1963), "Factors of Industrial Location in Ohio" Ohio State University, Nigeria.

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- Schemenner, R.W., Huber, J.C. and Cook, R.L. (1987), "Geographic Differences and the Location of New Manufacturing Facilities," Journal of Urban Economics, Vol. 21, No. 1, pp. 83-104.

CONFERENCE PAPERS

- Garg, Sambhav (2011): "Business Ethics" Paper presented at the Annual International Conference for the All India Management Association, New Delhi, India, 19–22 June.

UNPUBLISHED DISSERTATIONS AND THESES

- Kumar S. (2011): "Customer Value: A Comparative Study of Rural and Urban Customers," Thesis, Kurukshetra University, Kurukshetra.

ONLINE RESOURCES

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- Garg, Bhavet (2011): Towards a New Natural Gas Policy, Political Weekly, Viewed on January 01, 2012 http://epw.in/user/viewabstract.jsp

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EFFECTIVENESS OF COMPUTER ASSISTED INSTRUCTION IN RELATION TO THE LEARNING OUTCOMES OF THE ENGINEERING MANAGEMENT STUDENTS OF UNIVERSITY X

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PHILIPPINES

ABSTRACT

The study aims to determine the difference between the learning outcomes in traditional classroom environment compared to computer –assisted instruction environment. The research design is a quasi- experiment since two groups were evaluated, the control group and the treatment group. The participants for both groups are the different engineering students taking up engineering management subject. Both groups have the same reference book, reference materials, course content, course management and the same professor. The control group used traditional classroom environment and the treatment group used computer assisted instruction. The experimental study was done for the whole semester or 5 months. Output of this study is the learning outcomes of both groups as reflected in their quizzes, major exams, case study and final grade. SPSS was used to test the significant difference of the two groups.

KEYWORDS

computer assisted instruction, traditional classroom environment, engineering education

INTRODUCTION

Teaching could be tedious especially if there are lots of formulas to work with and computations long enough to bored both instructor and students. Recent technological developments, however, offer instructors another method of teaching which is through the use of Computer Assisted Instruction (CAI). The use of CAI is rapidly increasing and several studies have been made to evaluate its advantages and benefits. For instance, Galvis et al (2011) compared two methods in teaching Occupational Adaptation Theory: Traditional Classroom Lecture (TCL) and Computer Assisted Instruction (CAI), the results shows that the CAI group had higher learning rate as they spent 46% less time than the TCL group to cover the material but the knowledge about the theory shows no significant difference (p<.05) between the two groups. Likewise, the study of Clinkscale(2002) on comparing the effectiveness of computer assisted instruction as against the traditional classroom lecture in teaching algebra showed that overall there was no significant difference between the two forms of instruction. On the other hand, Bastark, R. (2005) studied the educational advantages of computer assisted instruction (CAI) in teaching statistics, a quasi experimental design was used to compare the lecture only section and the lecture-plus-computer assisted instruction (CAI) section, the result shows that participants in the lecture-plus-CAI section obtained higher averages on midterm and final exams than participants in lecture only section. Hence, the different results and views from the literature suggest a continuing research on the effectiveness of computer assisted instruction in comparison to traditional classroom lecture.

PROBLEM STATEMENT

This study seeks to answer the question: Is there a significant difference in the learning outcomes of students in a traditional classroom environment compare to students who uses computer assisted instruction?

SCOPE AND LIMITATION OF THE STUDY

The study aims to compare the two groups (i.e., the control group which uses traditional classroom set up and the treatment group which utilizes computer assisted instruction) from the period of one semester or five months in terms of their learning outcomes as reflected in their mean scores of the different assessment activities.

The use of traditional classroom environment means that the teacher uses chalk and blackboard in explaining the topics, in a classroom with no air conditioned.

The use of computer assisted instruction means that the teacher utilizes computer which served as a platform in explaining the topic. Computer-assisted instruction (CAI) "refers to instruction presented on a computer" (Encyclopedia 2011). With the use of PowerPoint Presentation, plus attractive animation, sound and demonstration discussion becomes more interactive.

METHODOLOGY

A quasi experimental design will be used in the study since two groups will be evaluated.

The subjects of this study are the engineering students who attended the course: Engineering Management in University X. During the period of study, two sections are available, one has 27 students and the other has 29 students, with a schedule of thrice a week, one hour class for both sections.

One section with 29 students will be called control group in which they will be using a traditional classroom setup all throughout the semester. The other section with 27 students will be called treatment group as they will be utilizing computer assisted instruction through the use of Instructional Technology Room (ITR) all throughout the semester. The Instructional Technology Room (ITR) is equipped with computer and LCD and a fully air conditioned room.

The two groups will be under the same teacher with the same course coverage or syllabus (i.e., Engineering Management). Both groups will have the same textbook, the same class activities and the same sets of questionnaires for the assessment period.

At the end of one semester, the proponent gathers the learning outcomes of all students for both groups as reflected with their score in major exams, quizzes and case study.

Observations and analysis of will be done for the whole semester. Descriptive statistics will be used in the study to measure the variability and central tendency of their examination scores. Two independent sample T-test will be conducted to compare if there's a significant difference between the two groups with regards to their assessment scores.

RESULTS

This section presents all data that were gathered during the course of the study. All data were presented in tables along with their interpretation. It also involves analysis of the circumstances.

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TABLE 1 – DESCRIPTIVE STATISTICS – CONTROL GROUP (TRADITIONAL CLASSROOM USER / ITR NON-USER)

Learning outcomes	Minimum Score (%)	Maximum Score (%)	Mean Score (%)	Std. Deviation (%)
Preliminary Exam	50	92	77.24	8.88
Midterm Exam	58	98	88.34	8.91
Final Exam	59	90	77.52	7.14
Case Study	50	92	85.24	7.54
Quiz 1	74	80	75.90	1.45
Quiz 2	50	90	71.38	16.32
Quiz 3	50	98	80.35	12.71
Final Grade	68	90	80.35	5.47

TABLE 2 – DESCRIPTIVE STATISTICS – TREATMENT GROUP (COMPUTER ASSISTED INSTRUCTION / ITR USER)

Learning outcomes	Minimum Score (%)	Maximum Score (%)	Mean Score (%)	Std. Deviation (%)
Preliminary Exam	50	89	77.89	8.27
Midterm Exam	76	98	88.11	6.73
Final Exam	70	89	78.63	4.83
Case Study	70	95	83.15	7.49
Quiz 1	78	98	91.33	5.51
Quiz 2	50	97	73.89	12.42
Quiz 3	75	98	87.04	7.00
Final Grade	76	88	82.78	3.37

Table 1 and 2 show the learning outcomes of the control group and treatment group as reflected in their examination scores.

The major exams: preliminary exam, midterm exam and final exam are 50-item multiple choice questions, which are divided into 25 items as easy, 15 items as moderate and 10 items as difficult.

The first major exams is the preliminary covering three (3) chapters; Chapter 1 (Introduction to Engineering Management); Chapter 2 (Planning) and Chapter 3 (Organizing). The mean score for control group is 77.24% with standard deviation of 8.88% while the mean score for treatment group is 77.89% with standard deviation of 8.2%. Few students in both group got a score of 50%. On the other hand, one student in the control group got 92% which is the highest score in the preliminary exam. Looking at the mean scores as well as the standard deviation of both groups, it implies that there's no significant difference between them because the difference is very small less than 1%.

The coverage for midterm exam is also three (3) chapters; Chapter 4 (Staffing), Chapter 5 (Communication) and Chapter 6 (Motivation). Mean score for control group is 88.34% with standard deviation of 8.91% while the mean score for treatment group is 88.11 % with standard deviation of 6.73%. Students in both groups have incurred a highest score of 98%. However, in the traditional classroom environment, one student got the lowest score of 58%, whilst in the computer assisted instruction the lowest score is 76%. Moreover, all students in the treatment group which utilizes computer assisted instruction passed the midterm exam. Nonetheless, the mean score and standard deviation score for both groups reflected a little difference in score , hence it implies that overall, their midterm exam scores has no significant difference.

Final exam covers all the nine (9) chapters in the reference material of Engineering Management. Although, during the final weeks which has a duration of six(6) weeks of the whole semester, the topics discussed are ; Chapter 7 (Leading), Chapter 8 (Controlling) and Chapter 9 (Operations Management). The mean scores for both group ranges to 78% and the standard deviation has a little difference of 2%, which implies a no significant difference between their mean scores.

On the other hand, quizzes are a 25-item multiple choice exam. The first learning assessment prior to major exams is Quiz #1, the mean score for the treatment group is 91.33 % which is higher than the control group with mean score of 75.90%. Other assessment activities like Quiz # 2 and Quiz #3 implies significant *difference with regards to the* mean scores of both groups.

The mean scores of quiz 1, quiz 2, quiz 3, final quiz and final grade seems to have a large difference on their respective scores between the control group and the treatment group. To validate this claim, the proponent uses statistical treatment of two independent samples test.

TABLE 3 – COMPARING MEANS OF TWO INDEPENDENT SAMPLE TEST

	t_o	$t_{a,b}$	Rejection Criterion	Conclusion
FE	0.181271	2.004881	IF $|t_o| > t_{a,b}$	*no significant difference*
Quiz 1	3.898446			***with significant difference***
Quiz 2	0.172182			*no significant difference*
Quiz 3	0.509303			*no significant difference*
Final Grade	0.530628			*no significant difference*

Alpha ($\alpha = 0.5$)

Table 3 indicates that Quiz #1 has a significant difference between the mean score of the control group which applies the traditional classroom environment and the treatment group which utilizes computer assisted instruction. This shows that the Instructional Technology Room (ITR) users initially has a motivation to study because of the optimum environment they have experienced. Other than that, all assessment activities like all major exams and other quizzes as well as the final grade do not have a significant difference in the mean score of both groups.

CONCLUSIONS

The overall findings is that, there is no significant difference on the learning outcomes as reflected by the mean score from the different assessment activities of both the control group which applies the traditional classroom set up and the treatment group which utilizes computer assisted instruction. Signifying the course management and the teacher are still the main player in influencing the learning outcomes of the students. The only exception to this is Quiz # 1 , which after statistical treatment yields a significant difference on their mean score. The treatment group got a higher mean score of 91.33 % as compare to the mean score of the control group which is 75.89%. This suggests that the use of CAI increases the motivation of the students to study and learn more. Furthermore, it implies that the improvement of facilities of University X were helpful in upgrading the learning outcomes of the students by means of communicating effectively the topics.

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