DE LA SALLE UNIVERSITY

Republic of the Philippines
DEPARTMENT OF EDUCATION, CULTURE AND SPORTS
National Capital Region
Metro Manila

THESIS ABSTRACT

TITLE: Development, Validation and Evaluation of Modules on Selected Topics in Probability and Statistics

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SCHOOL: De La Salle University

SUBJECT AREA: Probability and Statistics

DEGREE CONFERRED: Master of Science in Teaching

MAJOR: Mathematics

STATEMENT OF THE PROBLEM:

This study aimed to develop, validate and evaluate modules in probability and statistics to determine their effects on the academic achievement of engineering students taking the subject Engineering Probability and Statistics at Adamson University.

Specifically, this study sought answers to the following questions:

1. What are the difficulties of Adamson University
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eering students in probability and
statistics?

2. How did the evaluators assess the proposed
modules as regards their
2.1 content?
2.2 readability?
2.3 format?

3. What are the effects of the modularized
instruction and the traditional instruction on
the academic achievement in probability and
statistics of the students as inferred from the
answers to the following questions:

3.1 Is there a significant difference in the
academic achievement of the experimental
group of students before and after under-
going modularized instruction?

3.2 Is there a significant difference in the
academic achievement of the control group
of students before and after undergoing
traditional instruction?

3.3 Is there a significant difference in the
academic achievement of the students who
underwent traditional instruction and those
who were subjected to modularized
instruction?
PROCEDURE:

This study made use of two research designs, namely, the research and development design and the pretest-posttest control group design. This is basically a research and development study because the modules were developed after finding out the difficulties of the students taking the subject Engineering Probability and Statistics. The modules were then field tested and subsequently evaluated by means of an experiment using the pretest-posttest control group design. Based on this design, the control and experimental groups were given pretests before they were allowed to undergo different treatments and then were given posttests. The experimental group was subjected to modularized instruction while the control group underwent traditional instruction on the topics covered by the modules.

To identify the difficulties of the students in probability and statistics, the study made use of the following instruments: diagnostics test and student and teacher questionnaires.

To validate the modules, the study made use of the following assessment instruments: Feedback-based Readability Formula, student questionnaire for the evaluation of the modules and teacher questionnaire for the evaluation of the modules.
To determine the effects of the traditional and modularized instruction on student achievement, the experimental group was given modularized instruction in the selected topics while the control group was exposed to traditional instruction throughout the term. Pretests and posttests were given to both groups on the selected topics.

The t-test for dependent samples and t-test for independent samples were used to test the hypotheses of the study.

FINDINGS:

Following are the findings of the study:

1. Based on the results of the diagnostic test administered to two Engineering Probability and Statistics and on the responses to evaluation questionnaires given to both teachers and students, it was determined that the three most difficult topics covered in an Engineering Probability and Statistics course are Probability Sampling Theory and Mathematical Expectation.

2. The different assessment procedures employed during the validation stage of the module development phase revealed the following:

2.1 The modules are readable as far as the student evaluators are concerned based on
the computed communication indices (C.I.).

The C.I.s classified all modules as "quite clear" instructional materials.

2.2 The modules possess all characteristics required of an effective instructional material as far as the following aspects are concerned:

2.2.1 objectives
2.2.2 subject matter
2.2.3 design
2.2.4 learning activities
2.2.5 adaptability
2.2.6 evaluation

This was evidenced by the responses given by the teachers.

2.3 The lessons contained in the modules are quite clear and useful outside the classroom while the activities in the lessons are quite interesting as far as the student evaluators are concerned.

3. The statistical tests performed on the hypotheses of the study during the module evaluation phase revealed the following:

3.1 There is a significant difference between the pretest and posttest scores of the
students in the experimental group for all the modules.

3.2 There is a significant difference between the pretest and posttest scores of the students in the control group for all the topics covered by the modules.

3.3 There is a significant difference between the posttest mean scores of the experimental and control groups for all the involved topics.

CONCLUSIONS:

Since the posttest scores of both the experimental and control groups are significantly higher than the pretest scores, it may be concluded that the students can learn probability, mathematical expectation and sampling theory regardless of whether or not they use modules during concept formation. However, since the posttest mean score of the experimental group is significantly higher than that of the control group, then the use of modularized instruction is more effective than traditional instruction in the three topics mentioned.

RECOMMENDATIONS:

The researcher makes the following recommendations based on his findings and conclusions:
1. Adamson University may adopt the modules, with the Mathematics Department disseminating them, on a try-out basis and evaluate their effectiveness after one semester of implementation.

2. Future researches may be conducted

   2.1 to validate the findings of the study using a larger sample.

   2.2 to replicate the study, but in other mathematics courses in the college level.