

Comparative Study on Attitude towards Statistics for Business Undergraduates

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Abstract: The purpose of this study is to compare the attitudes towards statistics for business course for undergraduate students. Data were collected from 250 students for pretest study while 255 students from the posttest who were enrolled in Business Statistics course. The quantitative approach was used to compare attitudes of the students towards statistics course using the pretest and posttest version of SATS-36 instrument validated and copyrighted by Candace Schau. The result shows that group of students with positive attitude marked highest scores in all components while negative attitude have the lowest scores in all components. Neutral attitude marked scores in between the two groups. On average, it was shown that attitude of the students towards the course were slightly decreased from pretest to posttest, nevertheless, the analysis is still positive and the frequency of positive items were increased from pretest to posttest. However, statistically there is a significant difference between the pretest and posttest under difficulty, interest and effort component. In addition, no significant differences found from the other components. The pretest and posttest instruments of Survey of Attitude towards Statistics (SATS) were employed to compare the attitude level of the students towards the course. The aim of this study is to compare the attitude of the students towards statistics for business course before and after taking the course.

Keywords: comparative, Business Statistics, undergraduates, SATS, posttest, pretest, quantitative approach.

INTRODUCTION

Statistics educators are concerned on how their students change (both cognitive and non-cognitive) from the beginning to the end of the course. The most common way to use to address this issue is the pretest-posttest design. Student's attitude towards the course is being measured at the beginning of the course (pretest) and at the end of the course (posttest). According to Millar & Schau [3], the gain scores (posttest score – pretest score) can be used to explore change in any student, teacher, or class characteristic. Nowadays, attitudes towards statistics have increasingly more consideration in statistics education [1]. Their attitude towards the course affects their performance in the classroom. In fact Schau [4], pointed out that positive attitudes towards the course would help students to understand that statistics is useful for their professional and personal lives, and students can be trained to understand and use statistics.

Application of statistics is very wide in most of the field like Business and Economics, Research, Industry, Education, Agriculture, Health, Life Sciences and many more. Business Statistics has become essential and relevant to business individuals, allow them present and describe business data and information properly, make reliable forecast about a business activity and improve business processes as well. Correct statistical usage provides not only any trends in what has happened in the past, but also predicts what may happen in the future. Therefore, statistics courses are important and compulsory at the higher education level both for undergraduate and graduate students [1].

Attitude of students towards the course is important in their course achievement both cognitive and non-cognitive factors. A positive attitude towards the course shows a strong positive performance towards the course. In addition, Gal, Ginsburg & Schau [2] showed that attitude towards statistics influences a person's statistical behavior inside and outside classroom and their willingness to attend statistics courses in the future. Schau [4] pointed out that positive attitudes towards statistics would help students to understand that statistics is useful for their professional and personal lives, and students can be trained to understand and use statistics. On the other hand, a negative attitude towards the statistics course is a hindrance in learning the course effectively and started to dislike the course.

This paper examines common analysis methods used to analyze pretest and posttest data. Two sets of data containing scores assessing students' attitudes towards statistics were used in comparing the attitude of the students in statistics for business before and after taking the course. The purpose of this study was to evaluate and compare the

attitude of the students towards statistics before and after taking the course. Furthermore, test of significant differences on the attitude components towards statistics before and after taking the course was included in this study.

RESEARCH OBJECTIVES

Generally, this study examined to evaluate students' attitudes when they entered and left the course. Specifically, this study explored to

1. Compare students' attitudes towards statistics before and after taking the course.
2. Is there a significant difference on the attitude components towards statistics before and after taking the course?

RESEARCH METHODOLOGY

Participants

The participants of this study were enrolled in Business Statistics course for the Second Semester SY 2015-2016 under the College of Business, Entrepreneurship and Accountancy of Cagayan State University. The participants were enrolled in different fields like business administration, accounting and legal management. They were asked to fill-up the pretest and posttest survey form of the SATS instrument to compare the attitudes towards the course. The number of participants for pretest was 250 while for posttest was 255 together with $\alpha = 0.05$.

Instrument

Survey of Attitudes towards Statistics (SATS) instrument was used in order evaluate and compare students' attitude towards the course. SATS was developed and copyrighted by Ms. Candace Schau which assesses both cognitive and non-cognitive factors. There are two versions of SATS, namely SATS36 and SATS28. The new version (SAT36) was being utilized in this study for both pretest and posttest instrument and has 36 items of the instrument with six attitude components which are affective, cognitive, value, difficulty, interest and effort [5].

Responses to each item in the instrument were scaled from a 7-point likert scale, 1 for being strongly disagree and 7 for strongly agree. Out of 36 items, 19 were negatively worded and they were reversed coded transforming it into positive wordings. Higher scores indicate more positive attitudes towards statistics.

Statistical Analysis

Quantitative approach was used to compare attitudes of the students towards the course before and after taking the course. T-test was used to verify significant differences between the pretest and posttest scores.

RESULTS AND DISCUSSIONS

Table 1: Comparison of Mean and standard deviation scores (Pre-test and Post-test) of Attitude towards Statistics course for Business

Attitude components	Pre-test			Post-test		
	Mean	s.d	Assessment	Mean	s.d	Assessment
Affective	4.68	0.93114	positive	4.83	0.89443	positive
Cognitive Capability	4.91	0.87979	positive	4.98	0.84786	positive
Value	5.17	0.82814	positive	5.07	0.81301	positive
Difficulty	3.22	0.59555	<i>negative</i>	3.43	0.67951	<i>negative</i>
Interest	5.65	0.93493	positive	5.36	0.92467	positive
Effort	6.02	0.86210	positive	5.8	0.78136	positive
Grand Mean	4.94	0.838608	positive	4.91	0.823473	positive

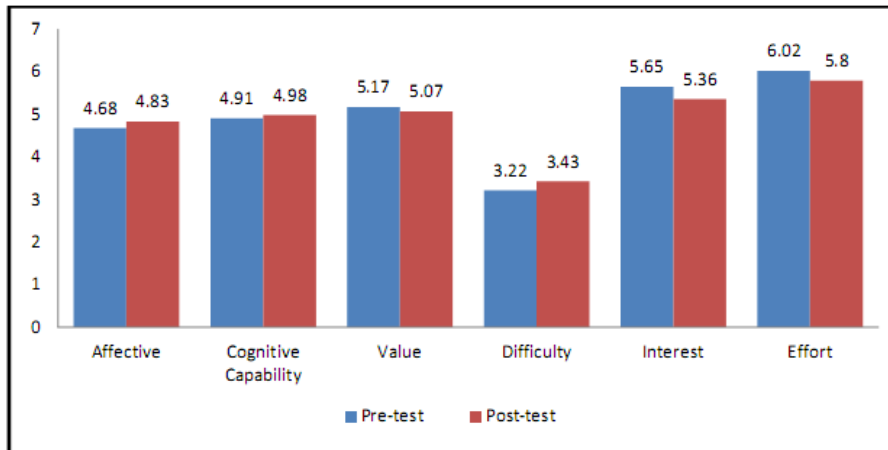


Fig-1: Mean comparison of pretest and posttest of attitude towards the course

Table 1 and figure 1 presents the comparison of mean and standard deviation scores of the students before and after the course. It can be viewed from the table that the affective component’s average increased slightly from pretest to posttest with a mean of 4.68 and 4.83 respectively. Both of these averages are positive which means that students expressed positive feelings towards the course under affective component.

For cognitive capability, again the mean scores increased slightly from pretest to posttest with a mean of 4.91 and 4.98 respectively. Both pretest and posttest scores under this component shows positive attitude towards the course which means that students felt reasonably confident about their abilities when applied to statistics.

On the other hand, value component’s mean scores decreased slightly from pretest to posttest results. The mean score of pretest is 5.17 while for posttest is 5.07. Although the attitude of the students under this component decreased nevertheless both of these averages are positive which means that students still realized the significance and usefulness of the course in their personal life and future profession.

Meanwhile, difficulty attitude component shows slightly increased in their mean scores from pretest to posttest assessment. It can be viewed from the table that the mean score for pretest is 3.22 while 3.43 for posttest. Both of these scores are negative however, the truncation increased slightly which shows a better improvement on their feelings towards the course in terms of difficulty level.

In addition, for interest component, the mean scores decreased moderately from pretest to posttest evaluation as the figure shows. Their mean scores are 5.65 for pretest while 5.36 for posttest and yet these values are still positive and so students express their full interest towards the course.

For effort component, it can be viewed from the figure that the pretest and posttest means scores truncate less on the posttest scores from 6.02 to 5.8 just like the interest component. However, these mean scores were still positive which means that students still show their effort to learn statistics.

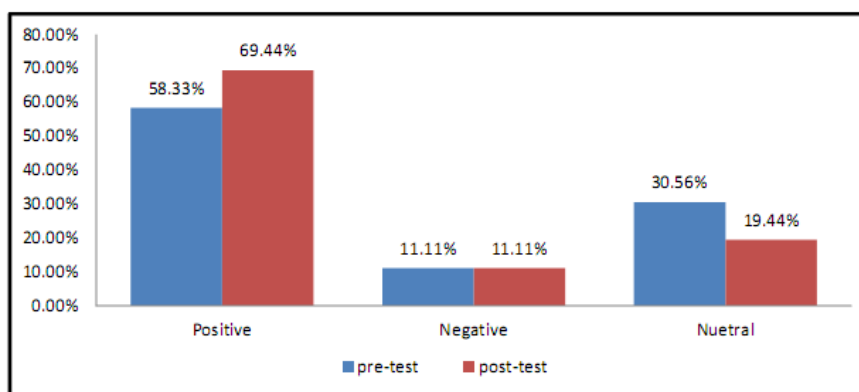


Fig-2: Comparison on the percentage of positive, negative and neutral attitudes towards statistics

There were three groups of students in this study, namely students with positive attitude, negative and neutral. It can be viewed from the figure (see figure 2) that most students were in the positive group and there was an increased on the percentage of positive attitudes towards the course from pretest to posttest although the overall mean attitude decreased slightly e.g. 4.94 for pretest while 4.91 for posttest. Although the frequency of negative attitude toward the course remains the same, the neutral group decreases from pretest to posttest which shows that their difference was transformed to positive attitude.

Table 2: Significant difference on the attitude components between the pretest and posttest

Attitude Components		Paired Differences			t	df	p-value
		Mean	Std. Deviation	Std. Error Mean			
Affective	Pre - Post	-.15659	1.26533	.08003	-1.957	249	.052
Cognitive	Pre - Post	-.07676	1.21856	.07707	-.996	249	.320
Value	Pre - Post	.10952	1.19098	.07532	1.454	249	.147
Difficulty	Pre - Post	-.21676	.86486	.05470	2.317	249	.021
Interest	Pre - Post	.29600	1.29716	.08204	3.608	249	.000
Effort	Pre - Post	.21200	1.19068	.07531	2.815	249	.005

Table 2 reveals significant differences on the attitude components towards the course between pretest and posttest scores. It can be viewed from the table that statistically, there is a significant difference between the pretest and posttest under difficulty, interest and effort component. It can also be observed from the table that the mean gain scores of these components appeared moderately higher as compared to affective, cognitive and value component (see table 2).

CONCLUSION AND RECOMMENDATION

This study was intended to evaluate the undergraduate student's attitudes towards the statistics for business before and after the course. Findings revealed that the average attitude of the students for affective, cognitive capability and difficulty components were increased slightly from pretest to posttest scores but the other components decreases but then these figures were still assessed as positive. In addition, there is a significant difference between the pretest and posttest scores of the students under difficulty, interest and effort component but the rest found insignificant. In addition, students with positive attitude towards the course had increased from pretest to posttest.

For further investigation, frequently data collection should be done for better understanding on issues regarding student's attitude towards statistics. Researchers may also be utilized the pretest and posttest version of SATS for further study. Other factors such as poor basic education foundation, teacher's factor and course syllabi design should also be investigated when assessing student's attitude towards statistics.

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