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Students' Attitude toward Statistics

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Abstract: ***The study used the Survey Attitudes Toward Statistics (SATS) devised by Candace Schau to investigate the attitudes toward statistics and the relationship of those attitudes to the students' sex, course and performance. Participants' responses are analyzed through mean, t-test and pearson correlation. Findings revealed that students have positive attitude toward statistics, though some display a negative attitude on statistics .The students have different attitudes when clustered according to their sex, course and performance. A pattern on the students' performance and attitudes was revealed, the more positive the attitude is, the higher the performance.***

1. Introduction

Statistics had been believed to start at around 1749.In the early times statistics was used primarily to gather information about a state but today it is considered as one of the most important tools not only for gathering information but also as an inductive method in research methodology. Statistics had been a part in every college's curriculum, for it is given in a series of courses. Despite of the students' familiarity in the subject, there are a number of students who dislike statistics. They believed that it is a complicated field because it is related to mathematics, probability, computers and statistical programs.

In a society where statistics is generally respected and highly regarded but relatively rarely understood, knowledge of statistics can make a difference in one's quality of life. However, there is one more important issue to becoming a statistically able individual than just taking the required statistics course, passing the subject and then forgetting it- and this is identifying those individuals who have negative attitudes to statistics and gain a better understanding of what specifically contributes to their attitudes toward Statistics.

Hence, more works are to be accomplished in order to help students turn their negative attitude into a more positive attitude toward statistics. Continuing development program is an important strategy to remedy the lack of students' statistical content and knowledge and therefore it is important to motivate them to participate actively in every activity so they will understand the importance of statistics and how applicable it is in their future careers.

2. Objective

The objective of this research is to study the attitude of the students toward statistics. The main questions are–

1) What is the students' attitude toward statistics?
2) Do students differ in their attitudes toward statistics across discipline?
3) What is the students' performance in Statistics?

3. Methodology

This study was carried out on the undergraduate non majoring statistics students of three subjects viz Commerce, Economics, and Education enrolled in Dibrugarh University. SATS-36 is used to collect information of students in the beginning of their semester (in which the paper exists) and at the end of the respective semester.SATS-36 has a seven-point response scale (1=strongly disagree,4= neither disagree nor agree, 7= strongly agree). The survey is available in pre and post versions to measure attitude toward statistics at the beginning and at the end of the semester.

A mean score was employed to conclude the respondents' feedbacks toward each attitude items given in the survey form. A high score shows a positive attitude. Assessment of interpretation about the student's attitude toward the statistics is categorized as positive if the mean score is 4.50 to 7.00, neutral for 3.51 to 4.49 and negative for scores 0.00to 3.50.

A sample of 345 graduate students of Dibrugarh university participated in the study . This sample included 178 commerce students, 57 Economics students and 109 Education students. The Survey Attitude Toward Statistics (SATS) created by Candace Schau in 1990 is used.

The SATS measures six attitude component: Affect, Effort, Cognitive Competence, value, Difficulty and Interest.

Data analysis

The data are analyzed using the mean, t-test and pearson correlation.

Table-1 contains the demographic characteristics of the 345 students who completed the administration of the survey.

Table 1: Table for Demographic information

Variables		Frequency	Percentage (%)
Sex	Male	191	55.36
	Female	154	44.64
	Total	345	100.00
Course	Commerce	178	51.59
	Education	109	31.59
	Economics	57	16.52

	Total	345	100.00
Performance	Very good	20	5.80
	Good	153	44.35
	Fair	130	37.68
	Pass	42	12.17
	Total	345	100

Table-2 provides the overall attitude toward statistics by considering the 6 component of the SATS instrument for pre and post version.

Table 2: Overall attitude toward Statistics

Component	Mean	
	Pre-test	post-test
Effort	5.51	5.55
Affect	4.43	4.71
Cognitive	4.56	4.77
Competence	3.49	3.53
Difficulty	4.47	4.17
Value	5.10	5.36
Interest	4.50	4.57
Overall		

The above table shows that students have positive attitude toward Effort, , Interest component in pre and post test. But students display neutral attitude on value component in both the test. On Affect component students display neutral attitude in pre test but positive attitude in post- test. But again students display negative attitude on difficulty component in pre test and neutral attitude in post test.

Table-3 describe the attitudes of the students to statistics when their course, sex and performance are considered.

Table 3: Attitude of the students toward statistics by the selected variables

Variables		Mean	
		Pre	Post
Sex	Male	4.5848	4.6176
	Female	4.5180	4.5439
Course	Commerce	4.6096	4.7978
	Economics	4.3756	4.4679
	Education	4.3876	4.4391
	Performance very good	5.493827	5.22629
	Good	4.482107	4.555745
	Fair	3.550387	3.622201
	Pass	2.732026	2.680538

From the above table, we have found that male and female students have positive attitude to statistics in both the test. Again Commerce students have positive attitude to statistics but Education and Economics students have neutral Attitude toward statistics for pre test and post test. The performance of the students in the subject simply described their attitudes . The students who have high grades have a higher positive attitudes as compared to those who have lower grades.

Table 4: Difference in the Attitude of the students toward statistics for pre test

variables	t	d.f	Sig(2-tailed)	Mean difference
Sex	1.893	343	.059	.06682

Table-4 shows that there is no significant difference between the attitudes of male and female students toward statistics.(sig value, .059>.05)

Table 5: Difference in the Attitudes of the students toward statistics for post test

Variables	t	d.f	sig(2-tailed)	Mean difference
Sex	-1.17	343	.241	-0.7368

From the above table we see that there is no significant difference between the attitudes of male and female toward statistics in post-test(sig .241>.05).

Table 6: Correlation between students' attitude toward statistic in pre and post survey for different subject

Course	Correlation between pre and post	Sig (2-tailed)
Commerce	.480	.000
Education	.594	.000
Economics	.264	.073

From this table we see that in commerce and Education, correlation is significant.(.000<.05).But in Economics correlation is insignificant.(.073>.05)

Table 7: Correlation between attitude toward statistics in pre and post survey for male and female

Sex(male)	Correlation between pre and post	Sig (2-tailed)
Effort	.512	.000
Affect	.204	.011
c.c	.399	.000
Difficulty	.116	.153
Value	.331	.000
Interest	.366	.000
Overall	.512	.000
Sex (Female)		
Effort	.561	.000
Affect	.313	.000
Cognitive competence	.417	.000
Difficulty	-.084	.249
Value	.477	.000
Interest	.473	.000
Overall	.473	.000

From the above table we see that in all component except Difficulty correlation are significant. In difficulty, correlation is insignificant(.153>.05 and .249>.05). Therefore we may say that there is positive correlation between attitude toward statistics pre and post according to male and female.

4. Conclusion

The present study examined the responses of the 345 students with majors from Commerce, Economics, and Education. The first question is to determine the attitudes of the students toward statistics. Overall the attitude of the students toward statistics is positive. When the attitudes components were analyzed, the students displayed a negative attitudes on the difficulty component. Some students find the subject difficult because they simply lack the knowledge needed to understand the subject. Some students spend few hours studying statistics and others do not really appreciate the subject and some simply ignore it.

Some students get frustrated over statistics test in class, since statistics is a complicated subject, that it requires a great deal of discipline, highly technical and it is not the subject quickly learned by most people.

Male and Female students display positive attitude toward statistics. The attitude of male and female students do not differ significantly.

Finally, a difference was seen on the students' attitudes when grouped by course. The Commerce students have more positive attitude compared to Economics and Education students. The students of Economics and Education have little interest on the subject and they do not see the value of the subject in their career. The students with better performance have more positive attitude toward statistics.
Again a significant relationship between the attitude and course and sex of the students was also noted. Knowing the attitude of the students would bring a clear view that sex and course can predict attitude.

Undergraduate students usually have a negative attitude toward statistics. Those who believed that they have a little knowledge and skills in statistics have trouble understanding the subject. Those who find the subject complicated and do not spend time learning it, sees statistics difficult. The students who have fun learning the subject, become interested to it. It was observed that student sex and course can predict performance and those having a positive attitude toward the subject perform better than those who have negative attitude on it. Knowing the students' capability in understanding the lesson is needed, the teachers may use this in developing a teaching technique that will enhance students' performance in statistics.

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