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EXPLORING STUDENTS’ ATTITUDES AND PERFORMANCE TOWARD STATISTICS ACROSS THE DISCIPLINE: DOES ATTITUDE AFFECT PERFORMANCE?

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ABSTRACT

The study used the Survey Attitudes Towards Statistics (SATS) devised by Candace Schau in 1990 to investigate the attitudes toward statistics and the relationship of those attitudes to the students’ sex, course and performance. Eight hundred sixty three (863) students from across courses in the College of Arts and Sciences and College of Business participated in the study. The paper used two designs, the descriptive survey and associational research, to fully understand the attitudes of the students to statistics. Participants’ responses were analyzed through mean, t-test, anova and Pearson correlation. Findings revealed that the students have positive attitude towards statistics, though some display a negative attitude on the difficulty, interest, value and effort on statistics. The male students show positive attitude compared to their female counterparts who showed a negative attitude to statistics. Further, the students have different attitudes when clustered according to their sex, course and performance thus a difference on their attitudes relative to the different variables considered was found. A pattern on the students’ performance and attitudes was revealed, the more positive the attitude is, the higher the performance.

KEYWORDS: Attitudes Towards Statistics, Students’ Performance, Across Disciplines.

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. This makes it a very important subject, especially in the tertiary level. Statistics had been a part in every college’s curriculum, for it is given in a series of courses. In fact, even in the secondary level this subject is already being introduced. 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, calculators, computers, and statistical programs. Many students avoid statistics because they
find it difficult, mind boggling and a source of their headache and frustration. They feel that numbers is a “trouble maker” in their school (Suharto, 2002). Likewise, probability, as how it manages to establish its reputation is an abstract science. Furthermore, calculators, computers and other statistical computing machines were believed to be a tool for the academically inclined persons only.

On the other hand, students in the tertiary level have different stories to tell about their experiences regarding their instructors in Statistics. Most students are in a mathematics classroom not as a subject preference but because as a course requirement. A problem with requiring all students to take Statistics in college evokes different attitudes. Attitude can be viewed as “affective responses that involve negative or positive feelings of moderate intensity” (McLeod, 2002). More recently Philipp (2007) described attitudes as manners of acting, feeling, or thinking that show a person’s disposition or opinion towards an issue or topic. They are relatively stable, resistant to change, and comprise a larger cognitive component and less emotional intensity than emotions. They develop as repeated positive or negative emotional responses and are automatized over time (Gal et al., 1997).

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 towards statistics.

Hence, more works are to be accomplished in order to help students turn their negative attitude into a more positive attitude toward statistics. Educators as motivators should come up with strong motivational strategies focusing on the capabilities of the students and tapping their mathematical potentials. Continuing developmental program is an important strategy to remedy the lack of students’ statistical content and knowledge (Hill & Ball, 2004) 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.

**Statement of the Problem**

This research intends to determine the attitudes and performance of the students in Statistics. Specifically, this answers the following questions:

1. What is the students’ attitude towards Statistics?
2. What is the students’ performance in Statistics?
3. Do students differ in their attitudes towards Statistics across discipline?
4. Are the students’ attitudes related to their performance?

**Hypothesis of the Study**

The researchers hypothesized that:

1. There is no significant difference in the attitudes of the students across disciplines.
2. There is no significant relationship between the attitudes of the students and their performance.

**Literature Review**

Statistics is a subject that is required to a large number of undergraduate majors and focuses on the conceptual ideas and tools used to work with data. It is one of the many subjects being required to social sciences, business and education that serve as a foundation for understanding how research is conducted. Ridgway, Nicholson, and McCusker (2007) noted that statistics is one important science used in social sciences and education. In fact, it is challenging to consider a discipline in which some level of statistics is not used.

Despite of the subject’s usefulness and importance in many careers, still most students view statistics course as a formidable obstacle (Dunn, 2000; Laher, Israel, & Pitman, 2007). Students are just concerned in the completion of the statistics’ course because it is a pre-requisite requirement for their major otherwise they will simply enroll in this subject and forget it afterwards. Previous researches have identified some cognitive and demographic factors related to students’ performance in Statistics subjects including gender, prior knowledge, mathematical ability, spatial ability, and pedagogical approaches (Derry, Levin, Osana, Jones, & Peterson, 2000). In fact many students’ behavior of liking and disliking the subject can be attributed to factors like teachers’ beliefs, methods, approaches and their environment.

In the study conducted by Penaroyo et al. (2011), they revealed that teachers seldom entertain queries or clarifications about the subject; those who usually sit at the middle of the classroom despite of the teachers’ sitting arrangement admitted that teachers’ personal beliefs and other factors cause their failures and eventually develop negative attitudes towards the subject.

Other issues concerning students’ failure in the subject can be traced with teachers’ over expectations from their students. Since students are in the tertiary level, they are expected to have mastered the many mathematical concepts needed in understanding statistics and because they cannot cope up with the teachers’ demand, the experience
becomes a nightmare, causing them to drop the subject or find other course where math is not a requirement.

Male perform better as compared to their female counterpart (Waters et al., 1988). There is no denying about this finding because from the time of the ancient mathematicians, male dominates the mathematics world. Whatever reasons and proofs behind this, teachers should still find a way to respond to one important educational objective, “Education for all”. Research tends to show that there is a positive relationship between STATS and students’ achievement (Sutarso, 1992) and the more positive the STATS the higher the statistical achievement (Roberts and Saxe, 1982). Robert and Reese (2007), found that regardless of gender grouping, more positive STATS tended to show a higher course grade. However, regarding the relationship between STATS and a number of previous college mathematics completed, there was an inconsistency among research findings. Some researchers found that there was a positive relationship between the number of previous college mathematics courses completed and the STATS. The more previous college mathematics course completed the more positive the STATS (Robert and Saxe, 1982; Roberts and Reese, 2007).

The demographic, cognitive, and pedagogical factors, affective and attitudinal factors among students should also be taken into consideration by instructors teaching statistics (Mills, 2004; Mulhern & Wylie, 2004; Onwuegbuzie, 2000). In fact, some scholars (Garfield & Ben-Zvi, 2007) have suggested that instructors should focus on the value of statistics in order to foster more positive attitudes toward statistics and should attempt to reduce the fear of statistics as an initial step of instruction.

Interestingly, most research focusing on the attitudes toward statistics have not fully explored differences across programs or majors. Some researchers who have investigated attitudes toward statistics within one discipline have recommended comparison across majors (Coetzee & van der Merwe, 2010). Though most social science and education majors have to take a required statistics course (Ridgway et al., 2007), there is little inconsistency about its findings. Students from across courses appreciate statistics (Mallari, et al., 2011). Griffith et al. (2012) exposes that business majors had a more positive attitudes compared to criminal justice. This finding provides evidence that majors have different attitudes towards statistics. This inconsistency could boomerang to who teaches the course. In some selected cases the subject is taught by an instructor from the mathematics, statistics or other departments who were not even so expert about the course, depending on the arrangement at the particular department. In addition to education and the social sciences, there are other majors (e.g.,
business) that are required to take a course in statistics and it should be of interest to
determine who best to teach statistics courses to these non-science majors. Mij (2009) studied
differences within a business school. Comparisons were made between students from
accounting, marketing, and management. It was reported that management majors had more
negative attitudes toward statistics than the other two groups. Since statistics is an important
subject that is required to students from across disciplines and the limited amount of research
comparing different majors, such comparisons may yield interesting results and show distinct
patterns across various disciplines which could be used to better tailor statistics courses for
students of a given major (Griffith et al., 2012).

It is important that the attitude of the students to statistics is being studied because it
may show important relationship to the learning process. In fact, studies have reported that
attitudes toward statistics were related to the development of statistical thinking skills, the
degree to which statistics will be used outside of the classroom, the likelihood of enrolling in
future statistics related courses, persistence, achievement, and the general climate in class
(Hilton, Schau, & Olsen, 2004). There are even researches revealing that the negative
attitudes toward statistics are related to poor performance in the class and other factors
contributing to the students’ anxiety towards the course (Waters, Martelli, Zakrjsek,
&Popovich, 1988). Many teachers have problems teaching statistics because it is regarded as
a complicated endeavour. There are reportedly selective factors contributing to students’
natural willingness to like the subject and these factors have to be taken into consideration.
Thus, there is ample evidence that among the many factors to take into consideration when
teaching a course in statistics, attitudes toward the course should certainly not be ignored
(Griffith et al., 2012)

If an instructor is going to consider attitudes toward statistics when teaching, there
must be valid ways to measure those attitudes. Today, there are already a lot of different
validated instrument that could measure attitudes towards statistics. To name, there is the 33-
item unidimensional measure referred to as the Statistics Attitude Survey (SAS) by Roberts
and Bilderback developed in 1980. The development of the SAS was anchored to the work of
Aiken who suggested that there were affective instruments that were capable of augmenting
cognitive measures of mathematics achievement. The second instrument was the Attitudes
Toward Statistics (ATS) scale developed by Wise in 1985 which had two subscales: the
attitude toward the field of statistics and the attitude toward the course. This was created in an
effort to improve on the SAS by focusing on items measuring attitudes, rather than student
success. Third is the Survey of Attitudes Toward Statistics scale (SATS) by Schau, a 28-item questionnaire which was initially reported to have four subscales consisting of affect, cognitive competence, value, and difficulty. The scale was later expanded to include two more dimensions of effort and interest (SATS-36; Schau, 2003). These versions SATS have concrete theoretical foundations since they are based on a number of popular theories such as the expectancy value, attribution, social cognition, and goal theories (Maehr, 1984). The newly enhanced scales have made important contributions to fully understand the attitudes of the students toward statistics.

There are number of instruments that have been developed and tested in an attempt to explain the correlation between attitudes, performance and other variables (Harlow, Burkholder, & Morrow, 2002; Tempelaar, Van Der Loeff, &Gijseelaers, 2007). However, despite of years of study on the attitudes towards statistics the parameters of this attitude have not been concretely finalized. In fact many different models like that of Harlow, Burkholder, & Morrow (2002); Tempelaar, Van Der Loeff, &Gijseelaers, (2007) have been tested in an effort to explain the relationships between attitudes, skills, and performance. However, despite of the number of years of study on the attitudes of the students toward statistics, the domains of these attitudes were not yet completely and concretely finalized because new concepts are continuously showing up parallel to the change of time. And since technology is already widespread and that online classes are becoming popular, then some dimension of technology as related to a statistics course may be worth examining.

Conceptual Framework

Attitude can be described as the tendency of an individual to learn and evaluate things around him. This may involve evaluation of people, issues or experiences. It is a mixed emotion or feelings about certain things. In most cases attitude may emerge directly from personal experiences. It can be negative or positive depending on the gravity of the experience. Similarly, attitudes of the students towards statistics depend on how they like the course. Most students loved the subject because they like the teacher teaching the subject, others include factors from their environment (such as friends, facilities of the school, parents, etc.) and some others like it because they simply love math.

Previous studies claimed that math is sexually biased-meaning males dominate this world. True enough because there are studies that proved that male performs better than female when it comes to mathematically oriented subjects like statistics. Male students are more logical and can see that path of numbers clearly. This is because males have a more
positive attitude towards the course. They find the subject less difficult and can see the value of statistics in their future careers. Likewise, majors of the students provide reason to claim that it determines their attitudes towards statistics. Normally, mathematics majors and most business students display higher positive attitudes on it thus, performing better in the subject.

METHODOLOGY

Participants

Undergraduate students enrolled in Statistics at Rizal Technological University on first semester of academic year 2012 – 2013 participated in the study. Eight- hundred sixty-three college students completed the survey questionnaire. This included 22 BS Biology students, 23 BS Statistics students, 41 AB Political Science students, 183 BS Psychology students, 170 BSBA major in Entrepreneurial Management students, 235 BSBA major in Marketing students, 172 BSBA major in Management students, and 17 BS Astronomy students.

Table 1 contains the demographic characteristics of the 863 students who completed the administration of the survey. Examination of the demographic information showed that majority of the students were female (76.25%). The number of the respondent was dominated by BSBA Marketing (27.23%) and BS Astronomy represents the lowest number of respondents (1.97%). Majority of the students’ performance in statistics is fair (34.18%), passing students (33.72%) and good students (22.83%).

Table 1. Demographic Information

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
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<td>TOTAL</td>
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<tr>
<td>COURSE</td>
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<tr>
<td>BS Biology</td>
<td>22</td>
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<tr>
<td>BS Statistics</td>
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<td>2.67</td>
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<tr>
<td>AB Political Science</td>
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<td>4.75</td>
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<td>BS Psychology</td>
<td>183</td>
<td>21.21</td>
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<tr>
<td>BSBA Entrepreneurial</td>
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<td>19.70</td>
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<td>Management</td>
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<td>BSBA Marketing</td>
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<td>BSBA Management</td>
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<td>19.93</td>
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<tr>
<td>BS Astronomy</td>
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<td>1.97</td>
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<tr>
<td>TOTAL</td>
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<td>100</td>
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<tr>
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<tr>
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<tr>
<td>Failure</td>
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<tr>
<td>TOTAL</td>
<td>863</td>
<td>100</td>
</tr>
</tbody>
</table>
Materials

A demographic questionnaire was used to gather information related to participants’ background such as: sex, course and performance. The Survey Attitudes Toward Statistics (SATS) created by Candace Schau in 1990 was used. The assessment scale is a 36 item, Likert scale ranging from 1 (Strongly Disagree) to 7 (Strongly Agree). The SATS measures six attitude components: Affect, Cognitive Competence, Value, Difficulty, Interest and Effort. The reliability coefficient values for each component is from results who reportedly used the SATS; Affect ($\alpha = 0.80 - 0.89$), Cognitive Competence ($\alpha = 0.77 - 0.88$), Value ($\alpha = 0.74 - 0.90$), Difficulty ($\alpha = 0.64 - 0.81$), Interest ($\alpha = 0.80 - 0.89$), and Effort ($\alpha = 0.80 - 0.89$). The attitude of the students in statistics was measured by summing up all the items in each category and dividing it by the number of the items. Higher scores correspond to a more positive attitude.

2.3 Procedure

Data were collected somewhere in the middle of the semester so that each student had an almost balance understanding of the subject. All participants were administered the questions in the classroom setting by the researchers themselves. The researchers collected the data in their respective classes that same day when the instrument was given to the students. Participants were assured that their responses will be held anonymous, only the researchers (instructors) of each class did see the responses. Participation in the study was voluntary in fact the students signed a waiver testifying that they were not forced to participate in the research.

The study used two descriptive research methods design. First is the descriptive survey approach because the researchers were interested in knowing the attitudes of the students in Statistics. According to Good and Scates as mentioned by Calmorin & Calmorin (2002), this approach was appropriate wherever the object of any class vary among themselves and one is interested in knowing the extent to which different conditions among these objects exist. Likewise, the associational design was also used since the researchers studied the relationship between two variables without any attempt to influence these variables (Fraenkel&Wallen, 2006), in this case the researchers explored the relationship between students’ attitude and performance in the subject.
RESULTS

After establishing certain categories and tallying the frequencies of participants across categories in the study, examination of the data occur. The data were analyzed using the mean, t-test, analysis of variance and pearson correlation. Table 2 provides the attitudes of the students toward statistics by considering the 6 components of the SATS instrument. Overall, the attitude of the students toward statistics is positive ($\bar{x} = 4.812$) with a standard deviation of 0.7204. This result does not imply a very strong positive attitude towards statistics since the mean is just few units above 4.49, the cut-off value leading to a positive attitude. The students also display a positive attitude on the different components of the SATS instrument. The effort component which describes the amount of work the students expends to learn statistics reflects a high degree of positive attitude ($\bar{x} = 5.869$). The difficulty component makes the students’ attitudes to Statistics negative ($\bar{x} = 3.997$).

Table 2. Overall Students’ Attitude toward Statistics

<table>
<thead>
<tr>
<th></th>
<th>Affect</th>
<th>Cognitive</th>
<th>Value</th>
<th>Difficulty</th>
<th>Interest</th>
<th>Effort</th>
<th>Overall Attitude</th>
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<tr>
<td>N Valid</td>
<td>863</td>
<td>863</td>
<td>863</td>
<td>862</td>
<td>863</td>
<td>863</td>
<td>863</td>
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<tr>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mean</td>
<td>4.759</td>
<td>3.792</td>
<td>4.506</td>
<td>3.084</td>
<td>5.271</td>
<td>5.369</td>
<td>4.4635</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.069</td>
<td>1.183</td>
<td>0.485</td>
<td>0.5444</td>
<td>0.312</td>
<td>0.729</td>
<td>0.7204</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.091</td>
<td>-0.289</td>
<td>-0.108</td>
<td>-0.160</td>
<td>-0.702</td>
<td>-1.346</td>
<td>-0.810</td>
</tr>
</tbody>
</table>

Legend (Mean)

1.00 – 3.49 - Negative Attitude
3.50 – 4.49 – Neutral Attitude
4.50 – 7.00 – Positive Attitude

The results contained in Table 3 described the attitudes of the students to Statistics when their course, sex and performance in the subject were considered. Statistics revealed that the male students have a positive attitude to Statistics ($\bar{x} = 5.430$) as compared to their female counterpart ($\bar{x} = 4.497$). As expected the BS Biology ($\bar{x} = 6.002$) students and BS Statistics ($\bar{x} = 6.087$) students, science and math majors respectively displayed higher positive attitude compared to students with other majors. Surprisingly, the BS Astronomy students, a science oriented course, displayed a lower attitude value to statistics...
while the BS Psychology ($\bar{x} = 3.391$), AB Political Science ($\bar{x} = 3.177$) and BSBA Entrepreneurial Technology ($\bar{x} = 3.086$) students show a negative attitude towards statistics. Other business students, though result found a neutral attitudes towards statistics, does not imply unwillingness to like statistics. The performance of the students in the subject simply described their attitudes because those who have high grades have a higher positive attitudes as compared to those who have lower grades.

Table 3. Attitudes of the Students toward Statistics by the selected variables

<table>
<thead>
<tr>
<th>VARIABLES</th>
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<th>N</th>
<th>STD. DEV</th>
</tr>
</thead>
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<td>0.7013</td>
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<tr>
<td>Female</td>
<td>3.497</td>
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<td>BS Statistics</td>
<td>6.087</td>
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</tbody>
</table>

In Table 4 the discrepancy between the attitudes of the students across variables was unveiled. Statistics show that there is a significant difference between the attitudes of male and female students towards statistics. Further, the result obtained a significant difference between the attitudes of the students toward statistics when their course was considered ($F = 0.015$, $slg. value = 0.000 < 0.05$). Furthermore, a significant difference was also visible in the attitudes of the students to statistics when they were grouped according to their performance in the course ($F = 4.764$, $slg. value = 0.000 < 0.05$).
Table 4. Difference in the Attitudes of the Students Toward Statistics

| Variables | t  | Df  | Sig. (2-tailed) | Mean Difference |
|-----------|----|-----|----------------|----------------|----------------|
| Sex       | 0.409 | 865 | 0.015          | 0.556          |

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>31.255</td>
<td>8</td>
<td>3.907</td>
<td>8.015</td>
<td>0.000</td>
</tr>
<tr>
<td>Within</td>
<td>418.21</td>
<td>855</td>
<td>0.487</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>449.46</td>
<td>863</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>12.698</td>
<td>6</td>
<td>2.540</td>
<td>4.784</td>
<td>0.000</td>
</tr>
<tr>
<td>Within</td>
<td>455.484</td>
<td>857</td>
<td>0.531</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>468.182</td>
<td>863</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5 described that there is a moderate correlation between the attitudes of the students towards statistics and their performance to Statistics

\[(r = 0.542, \text{sig. value} = 0.002 < 0.05)\]

The attitude components such as; affect, cognitive competence, difficulty and interest show significance at 0.01. The relationship between the students’ sex and attitude towards statistics is low \[(r = 0.415, \text{sig. value} = 0.009 < 0.05)\] and is significance at 0.05. The value and effort component is significant at 0.05 while difficulty and interest is significant at 0.05. The data further display a moderate correlation between the students’ attitudes towards statistics and course \[(r = 0.518, \text{sig. value} = 0.017 < 0.05)\]. This result is significant at 0.01. What is interesting in the correlation between the students’ attitudes and course are the components cognitive competence and difficulty. Both components the intellectual knowledge, and skills and difficulty experiences on the subject explain the students’ choice of course.
Table 5. Relationship between Students’ Attitudes and their Performance in Statistics and other variables

<table>
<thead>
<tr>
<th></th>
<th>Affect</th>
<th>Cognitive Competence</th>
<th>Value</th>
<th>Difficulty</th>
<th>Interest</th>
<th>Effort</th>
<th>Attitude Total</th>
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</thead>
<tbody>
<tr>
<td><strong>Performance</strong></td>
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<td></td>
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</tr>
<tr>
<td>Pearson Correlation</td>
<td>0.340**</td>
<td>0.427**</td>
<td>0.227</td>
<td>0.580**</td>
<td>0.693**</td>
<td>0.626</td>
<td>0.542**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.009</td>
<td>0.018</td>
<td>0.006</td>
<td>0.003</td>
<td>0.002</td>
</tr>
<tr>
<td>N</td>
<td>863</td>
<td>863</td>
<td>863</td>
<td>863</td>
<td>863</td>
<td>863</td>
<td>863</td>
</tr>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>0.174</td>
<td>0.283</td>
<td>0.734*</td>
<td>0.620**</td>
<td>0.510**</td>
<td>0.423*</td>
<td>0.415*</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td>0.320</td>
<td>0.003</td>
<td>0.000</td>
<td>0.051</td>
<td>0.009</td>
</tr>
<tr>
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<td>863</td>
<td>863</td>
<td>863</td>
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<td>863</td>
</tr>
<tr>
<td><strong>Course</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pearson Correlation</td>
<td>0.362</td>
<td>0.675*</td>
<td>0.064</td>
<td>0.652**</td>
<td>0.740</td>
<td>0.616</td>
<td>0.518**</td>
</tr>
<tr>
<td>Sig.(2-tailed)</td>
<td>0.047</td>
<td>0.028</td>
<td>0.001</td>
<td>0.000</td>
<td>0.142</td>
<td>0.635</td>
<td>0.017</td>
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<tr>
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<td>863</td>
<td>862</td>
<td>863</td>
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</tr>
</tbody>
</table>

*Correlation is significant at 0.05 **Correlation is significant at 0.01
DISCUSSION

The present study examined the responses of the 863 undergraduate students with majors from Business and Arts and Sciences. The first question is to determine the attitudes of the students towards statistics. Overall the attitude of the students toward Statistics is positive however, when the attitude 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. The difficulty that these students have experienced can be attributed to the effort that they give to the subject. Some students spend few hours studying statistics and others do not really appreciate the subject and some others simply ignore it. Another factor that contributes to the students’ difficulty in the course is their interest, since they don’t have the interest understanding statistical information they set aside the idea of learning the subject. Similarly, Mahmud (2009) revealed that students get frustrated over statistics tests in class, that 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. Some students can struggle in Statistics courses thus many perceive it difficult and unpleasant (Berk& Nanda 1998).

Male students display a remarkably high positive attitudes compared to their female counterparts. Consequently, more male students appreciate Statistics course and other mathematically oriented subjects unlike the female ones (Mallari et al., 2011).

In many cases, students’ attitude toward statistics can be best displayed depending on the course they take. Students who are enrolled in a mathematics oriented course like Statistics perform better than other students who are enrolled in Arts and Letters.

The attitudes of the male and female students differ significantly. Mahmud (2009) testified that females are more negative than the males. He depicted that males were not scared of statistics as compared to female, that they can learn statistics and felt confident mastering statistical materials.

Finally, an obvious difference was seen on the students’ attitudes when grouped by course. Almost all courses under study except BS Biology and BS Statistics find statistics difficult, they have little interest on the subject and they do not see the value of the subject in their career. There was a positive moderate correlation between the performance of the students and their attitudes toward statistics and this relationship is significant. In a previous study, attitudes toward statistics and achievement impact each other (Wisenbaker& Scott, 1995). The more positive the attitude is, the higher the performance becomes. Likewise, 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.

CONCLUSIONS AND RECOMMENDATIONS

Researching predictors of undergraduate students’ attitudes towards statistics is important in identifying possible barriers in developing the positive attitude of the students to statistics. Exploring how attitude relate to predicting future academic performance is also important as a means of promoting higher performance in statistics.

Undergraduate students usually have a negative attitude towards statistics. Those who believed that they have a little knowledge and skills in statistics have trouble understanding the subject. Those who think that the subject is worthless don’t see the usefulness, relevance and worth of statistics. 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 towards the subject perform better than those who have negative attitudes 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. Since the researchers had considered only limited information about the participants then, future researchers may replicate this study taking into consideration some other variables which were not used in this research.

REFERENCES