

Factors Related on Basic Statistical Skills among Students of Business Statistics Courses

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Abstract: In this research, the relationships among approaches of deep, strategic, and surface studying approaches along with the effect of gender on statistics basic skills are investigated. The participants in this investigation include of 200 students (86 males and 114 females) from accounting and business economics disciplines who have registered for business statistics subject in the first semester of academic year 2012-2013. The abbreviated inventory scale of studying approach was used to assess studying approaches and the statistics basic skills is a fifteen-item test that is prepared by the researcher. The Spearman test of non-parametric correlation coefficient showed that among studying approaches, there is a inverse relationship between surface studying approach and statistics basic skills. The Mann-Whitney non-parametric test also shows a significant difference between male and female students; the male students showed higher basic skills comparing to female students. The research results can be used in the statistics instruction and educational consultations.

[Rekabdar G. **Factors Related on Basic Statistical Skills among Students of Business Statistics Courses.** *Researcher* 2013;5(12):75-78]. (ISSN: 1553-9865) <http://www.sciencepub.net/researcher>. 9

Keywords: Statistics Education, Studying Approaches, Statistics Basic Skills.

1. Introduction

Paying attention to the educational level improvement and trying to resolve the existed shortcomings in obtaining the necessary knowledge for learners are considered by instructors and other educational researchers in all higher education fields.

Since statistics is a part of human modern science, comparing to other old sciences as mathematics, it has received less attention in the researches carried by the experts in educational sciences and also other researchers, and the studies that are done in this regard is limited. So it's necessary that the statistics education be considered by the researchers and those respective factors associated with improving students learning level in statistics should be studied. This study deals with some factors related to statistics education, especially the level of students basic skill in both economic and accounting disciplines which were not considered in the previous studies and then their relation with studying approaches and students gender will be studied.

The studying approach refers to the method in which a learner selects for familiarizing with study subjects.

In the initial researches were carried among Sweden students. Marton and Säljö (1976) presented the deep and surface processing for learning. In this study, these researchers found the students with deep approach could memorize the details better after five weeks. In deep approach, the learner studies to understand and perceive the subject meaning; whereas in surface approach, a student tends to

remember the subject components through repetition and considers them to be without any respective relation between each other. In other words, the student considers an external motivation as getting job through education.

"Entwistle" and "Ramsden" (1983) confirmed the Marton and Säljö works regarding to the surface and deep studying approaches, but they also presented the third factor as strategic (or achieving) approach to learning and studying. This factor is described as an approach to learning, that its aim is to gain success in first step as improvement in lessons grade. These students try to gain grade improvement through external motivation and selecting a strategic related to their goals, organizing and gaining study skills.

According to these researchers for being successful in learning, the students in higher education levels may use variety of studying approaches based on the special learning subject that they are dealing with. There are relatively many researches which are carried on the base of studying the relation between studying approaches and educational improvements. It is expected that the deep and strategic studying approaches to be as a predictor for higher education improvement and the surface studying approach to be associated with less educational improvement. In the studies regarding to students educational improvement, the positive correlations are found between deep and strategic studying approaches and these correlations are negative between surface approach and educational improvement (Diseth & Martinsen 2003). However, the relation between studying approaches and

educational improvement aren't studied in the statistics education field yet.

In most researches, the gender differences among male and female students are studied as an independent main variable. These differences are studied by the researchers in the statistics instruction. In most carried researches in statistics educational field, the obtained results show more positive attitudes of male students toward statistics comparing to those female students (Roberts and Bilderback, 1980; Waters and et al, 1988). In a meta-analysis of gender differences in applied statistics, Schram (1996; quoted by Haley and et al, 2007) got to this result that male-female performance is varied by the statistics course, the colleges which this course is established in, quality of grade measurement (exams and written exercises and homework).

In business colleges, the female students generally have weaker performance comparing to their fellow males. However, most of Keramz analyses are based on the psychological and educational science courses which are instructed through statistics. Johnson and Kouennen (2006) also found that in business statistics courses, the female students show a weaker performance in statistical improvement comparing to the male students. The average, instructor and simple mathematical skills have significant relations with the students' performance in the statistics subject.

According to the previous research limitations, two research questions will be raised in this study:

1. Is there any relationship between the studying approaches (surface, deep and strategic) and statistics basic skills?
2. Are the statistics basic skills different among male and female students?

2. Material and Methods

The statistical population of this research includes of all under graduated students (BA) in business economy and accounting disciplines (continuous-discontinuous BA), who are studying in Islamic Azad University, Abadan branch during the first semester of academic year 2012-2013.

The sampling method is stratified multi-stage; that is two characteristics are selected from the students in each study fields who are thought statistics subject by the researcher.

The economics students selected four-unit subject of statistics (2), the accounting continuous undergraduate students selected the four-unit subject of statistics and its application in management, and finally the accounting discontinuous undergraduate students selected three units subject of statistics and probability. The gathered sample includes of 200

students (86 males & 114 females) with the age domain of 19-50 years, average age of 25.29 and standard deviation of 5.45 years.

In this research, the abbreviated form of approaches and study skills inventory for students (ASSIST) is used for comparing the students studying approach (Entwistle, 2008). The studying approach scale includes of 18 items and three subscales. The subscales are respectively as the deep, strategic and surface approach; each of them includes of 6 questions. The ASSIST scale items are measured with Likert scale (1=strongly agree, 2=agree, 3=neutral, 4=disagree and 5=strongly disagree). In this study, the cronbach's alpha for each scale of deep, strategic and surface studying approach, respectively, are as 0.54, 0.60 and 0.58.

A questionnaire with fifteen questions of four choices is used for measuring statistics basic skills. Those questions with correct answers from students are considered as their statistics basic skills. The Spearman test of non-parametric correlation coefficient is used for examining the first research question. After considering basic skills among each male and female group, the Mann-Whitney U test is used for examining the second hypothesis. The applied software in this research was SPSS-13.

3. Results

In first research question, we intend to examine the relation between quantitative variables of deep, surface and strategic studying approaches and the quantitative variable of statistical basic skills. For this, the Spearman non-parametric correlation coefficient of these variables are listed together in table(1). According to this table information, the relationship between statistics basic skills and deep study in the error level of 5% ($r_s = -0.072$, $p > 0.05$) isn't significant. There is a direct relationship between the strategic studying approach and statistical basic skills, but this relation isn't significant in the error level of 5% ($r_s = 0.079$, $p > 0.05$). There is a reverse relationship between statistical basic skills and surface studying approach in the error level of 5% ($r_s = -0.142$, $p < 0.05$).

Table 1: Simple correlations between studying approaches and statistics basic skills

Studying Approaches	r_s	Sig
Deep	-0.072	0.312
Strategic	0.079	0.266
Surface	-0.142	0.045

Table (2) shows the Mann-Whitney test results of comparing the two groups mean score. As it is seen, the mean score of statistical preliminary skills for male student is 7.01 and their standard deviation is 1.93. For the female students, these figures, respectively, are as 6.2 and 2.37. The Mann-Whitney U test statistic is ($U=3790$), which its normal approximation in the error level of 1% is significant ($Z= -2.77$, $p<0.01$). So in the error level of 1%, the difference between male and female students regarding to their preliminary skills mean score in the statistics subject are confirmed. The male students obtain higher scores in the preliminary skills than female students. So with the error level of 1%, it could be claimed that the male students mean in the statistics subject are more than female students.

Table 2: Mann-Whitney test for effect gender on basic statistics skills

Gender	Mean Rank	Mann-Whitney U	Z	Sig
Male	113.43	3790	-2.77	0.006
Female	90.75			

4. Discussions

According to the great importance of statistics instruction in many educational fields, but unfortunately only rare applied researches in this regard could be found. The first research question is dealing, respectively, with the relationship between deep, strategic and surface studying approaches and statistics preliminary skills. As it could be noticed, there is only a weak reverse relation between the surface studying approach and statistics preliminary skills.

In other words, the surface studying approach could lead to decline in the statistical basic skills among students and the instructors could refer to this matter to help the students in improving statistical learning level.

According to Saif (2007, p.280) statements it cannot be said absolutely that one learning style is better or even worse than the other. It is better to say that based on the situation and learning subjects, a learning style could be bad and vice versa. However, the instructor shouldn't ignore the individual differences; but allow the students to apply appropriate styles according to different situations and various exercises and thus make the greatest advantages in this regard. As the learning and thinking styles about different subjects and activities could be varied.

The aim of second question in this research is to study the gender effect on statistics basic skills. Mann-Whitney non-parametric test results show that

comparing to female students, the male students have a better performances in the statistics preliminary skills. These results are in concordance with the researchers findings (Haley and et al, 2007) in which they stated the male students performance is better than their fellow females in the statistics course of business fields. In general, the female students are of more anxiety and negative attitudes toward statistics than the male ones. This anxiety and negative attitude toward statistics could lead to decline in the female students statistical skills. So, the statistics instructors should consider the sentimental differences between male and female students.

The world is in quick progress and paying attention to the researches plays a key role in a society progress. So, the preliminary knowledge in the statistics subject is necessary for answering the research questions and also makes a connection between human and environmental phenomena. This research results could be considered by the educational instructors and counselors; so that with presenting suitable strategies and modern methods in the education field, they help in improving the knowledge level among statistics students. The students statistic population in the accounting and economic disciplines is considered to be as one of the research limitations. In the future studies, these research questions and statistics preliminary skills should be investigated among the students from varied fields.

Acknowledgment:

This article is resulted from a research project which financed by Islamic Azad University Abadan branch.

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