



STUDENT'S ASSESSMENT ON THE UTILIZATION OF STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES (SPSS) SOFTWARE FOR BUSINESS STATISTICS COURSE

Ariel F. Melad*

Abstract: *In response to outcome-based higher education particularly in business statistics there is a need to reform the methodology to improve teaching-learning process. Developing statistical understating in business education is very important especially in the analysis of data. The use of SPSS software plays a vital role in the analysis of the data since the output will be the basis in interpreting the data. The students will be able to appreciate the software since it provides an accurate, quick and reliable output base on the data gathered. Furthermore, the software can improve collaborative learning and discipline of the students not only in statistics class but also to whole class in general. After the study, the students would be able to find the importance of the software and be able to recommend to other students as well. This paper highlights on the assessment of SPSS software by the students and assessment on the competency of the teacher in facilitating teaching - learning process.*

Keywords: *SPSS software, business statistics, teaching-learning process, collaborative learning, outcome-based higher education*

*MST, Cagayan State University, Andrews Campus, Tuguegarao City, Cagayan



INTRODUCTION

Statistics is one of the introductory subjects that is being taught in business courses, specifically Business Statistics course. Most of the students viewed this subject as hard science compared to other General subjects. Many of us teach statistics have to work hard in order to improve our instructions. Mathematics educators always explore ways to modify and improve teaching methods in order to meet the learning needs of the students.

Study shows that theory, research, and the experiences of both teachers and students of statistics indicate the attitudes towards statistics are important in teaching-learning process (Jatnika, 2015). Teachers and students of statistics believe that an attitude towards statistics is important. Students who feel and express negative attitude can create an uncomfortable atmosphere of the class. Attitude can also affect achievement and use of statistics in the life outside the classroom.

According to Bude, et.al (2007), in statistics education one can sometimes encounter students who think that there is a stable cause for failing an exam (e.g., statistics is a difficult subject). These students may no longer expect to benefit from studying statistics; they may start to dislike it and will not spend much study time on this subject. Other students may think that they have no control over the outcomes of their actions.

The integration of technology plays a vital role in teaching and learning mathematics. In fact technology is becoming an increasingly more integral part of our daily living encourages educators to integrate technology in teaching-learning process. Students make use of computers, laptops, tablets, i-pods and etc. in teaching and learning process. In mathematics, teachers integrate these technologies to facilitate teaching-learning process in the classroom and it is very useful in developing the higher order thinking skills, critical thinking, analysis and scientific theory(Nayak, 2013). The integration of technology in teaching is not a new issue, since teachers are looking for solutions to avoid time consuming routine work. The use of technology has a long history in mathematics education. According to Reston(2013), recent education reforms such as *K to 12 Basic Education* program (Department of Education, 2012), the Revised General Education Program in tertiary level and the introduction of Outcome-Based Education (Commission on Higher Education, 2012) have provided the opportunity for statistics education to assets its important role toward improved higher education outcomes.



The utilization of statistics software in the classroom like the SPSS, MegaSTAT, XLSTAT, SAT etc. helps to understand more the concept of statistics. Despite the high percentage of the students who use a calculator in mathematics course (Jatnika, 2015). The use of calculators alone is not sufficient because of the limited features of the said technology especially in teaching business statistics course. Thus, the use of SPSS software should be recommended in teaching statistics for independent learning. Students can work at their own pace and ability level, providing each student with confidence, success, and motivation to learn more. In the utilization of SPSS in the classroom, you could be able to reduced lecture time to 30-40% because the teacher rather chooses to monitor and guide the learning of the students to allow them to work cooperatively rather than lecturing the entire period. So that students gain more positive attitude towards statistics that's why some schools integrate SPSS in teaching statistics. Students will appreciate the software because they will see the importance or the difference of the manual computation and by using the software.

SPSS (Statistical Package for The Social Sciences) is a software package used for statistical analysis. The current versions (2014) are officially named IBM SPSS Statistics. The software is now popular in other fields as well including health sciences, business and agriculture. It is also used in market researches, health researches, survey companies, education researches, governments, marketing organizations, data miners, and others (Jatnika, 2015). SPSS is a comprehensive system for analyzing data. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and complex statistical analysis. SPSS is one of the most popular statistical packages which can perform highly complex data manipulation and analysis with simple instructions. It is designed for both interactive and non-interactive (batch) uses (Tatar, 2013)

It has been observed that the integration of such statistical software particularly in teaching has a positive effect on achievement in mathematics learning. Thus the integration of software in education environment is considerably important for mathematics education (Tatar, 2013). Educators play an effective role in this integration. Hence, examining teacher's perceptions and knowledge regarding the software is important in education. Teacher serves as facilitator in teaching-learning process. The aim of this study is for the students to



assess the utilization of SPSS in the classroom, the learning benefits derived from it and its effect on their academic performance of the students especially in business field.

Statement of the Problem

This study aims to assess the students on the utilization of Statistical Package for The Social Sciences (SPSS) software in understanding basic concepts in Business Statistics course in the classroom.

Specifically, this study was surveyed to answer the following questions:

1. What are the profile of the respondents in terms of:
 - a. Age
 - b. Sex
 - c. Program
2. How do the students assess the utilization of the software?
3. What are the reasons of the students why they prefer the software?
4. What is the assessment of the students on the competency of the teacher in using the software to facilitate learning?
5. Is there a significant difference on the assessment of the students in using the software when grouped according to profile?

METHODOLOGY

The study used the descriptive-correlational method of research. The descriptive statistics was used to summarize the profile of the respondents like percentages, frequency counts and mean. On the other hand, to answer the hypothesis, independent samples t-test and ANOVA were used. Student's profile is the independent variables while student's assessment is the dependent variables.

A questionnaire was utilized to gather information from the respondents. The researcher floated a questionnaire to the students to assess them on the utilization of the software prior the orientation and demonstration on the utilization of the software and discussion of the basic concepts in statistics. Features of the SPSS software were introduced to the students to familiarize them about the software. The researcher guided the students in using the software.

The questionnaire consists of two parts, namely, part I for the profile of the respondents and part II will be divided into three, namely, student's assessment on the software,



preference of students in using the software and assessment of the students to their teacher as facilitator in the utilization of the software. For part II, student's assessment on the software consist of eight items, preference in using the software also consist of eight items while student's assessment to their teacher also consists of eight items. All items were being answered by a 5- point likert scale, agree or disagree.

Data was taken from the a group of second year students taking up Business Statistics course for the Second Semester SY 2014-2015 under the College of Business, Entrepreneurship and Accountancy of Cagayan State University-Andrews Campus. Students were BS Accountancy, BS Accounting Technology, BS Entrepreneurship, BSBA –Financial Management and Marketing Management and BS Legal Management.

Results and Discussion

Table 1. Distribution of Respondents according to Sex.

Sex	Frequency	Percent
Female	99	75.0
Male	33	25.0
Total	132	100.0

Table 1 shows the distribution of respondents according to sex. It reveals that out of 132 respondents, 99 or 75% are female while 33 or 25% are male. This shows that most of the respondents are female.

Table 2. Distribution of Respondents according to Age

17.00	13	9.8
18.00	81	61.4
19.00	17	12.9
20.00	16	12.1
21.00	1	.8
22.00	1	.8
23.00	1	.8
24.00	1	.8
27.00	1	.8
Total	132	100.0

Table 2 shows the distribution of the respondents as regards age. Out of 132 respondents, 81 or 61.4% ages 18, 13 or 9.8% ages 17, 17 or 12.9% ages 19 , 16 or 12.1% ages 20 while the rest of the respondents ages above 20. Generally, finding indicates that most of the respondents ages below 20 the fact that most of them are regular 2nd year students.



Table 3. Distribution of Respondents according to Program

Courses	Frequency	Percent
BS Accounting Technology	69	52.3
BS Entrepreneurship	13	9.8
BSBA-Marketing Management	43	32.6
BSBA-Financial Management	1	.8
BSBA-Management Accounting	2	1.5
BS in Legal Management	2	1.5
No Response	2	1.5
Total	132	100.0

Table 3 presents the profile of the respondents as regards to their course, 69 or 52.3% are BS Accounting Technology program, 13 or 9.8% are BS Entrepreneurship students while 43 or 32.6% are BSBA major in Marketing Management students. The rest of the respondents are irregular students taking up BSBA-Financial Management, Management Accounting and BS Legal Management students. This findings show that information was gathered most from the BS Accounting Technology followed by BSBA major in Marketing Management the fact that they are regular students of the course.

Table 4. Student's assessment on the software (SPSS)

Items	Weighted Mean	Descriptive Value
1. The software is user friendly.	4.15	Agree
2. The software can make statistics concepts easier to understand.	4.29	Strongly Agree
3. The software facilitates in solving both descriptive and inferential problems.	4.26	Strongly Agree
4. I prefer the use of the software rather than manual computation.	4.42	Strongly Agree
5. The data is easy to interpret in using the software.	4.31	Strongly Agree
6. The software is important in learning business statistics course.	4.44	Strongly Agree
7. The software gives precise and reliable information from the data.	4.31	Strongly Agree
8. The software should be used also to other statistics class.	4.37	Strongly Agree
GRAND MEAN	4.32	Strongly Agree



Table 4 shows the assessment of the respondents on the software-SPSS. According to table 4, the respondents agree that the software is user friendly. This might be due to the fact that the software's feature is easy to use and navigate. SPSS has a very easy to learn command language and explanation of keywords and commands are available through online help. Students respond 'strongly agree' that the software improves their ability in understanding the concepts of statistics and the software facilitates them in solving statistical problems both descriptive and inferential problems having a weighted mean of 4.29 and 4.26 respectively. For this reason, the respondents prefer the software rather than the manual computations. Moreover, the data (output) is easy to interpret and gives precise and reliable information that's makes it vital to the learner and be recommended to other statistics class. According to Andrews (2010), using the correct statistical analysis means that the results are more useful and reliable, and hence any conclusions or recommendations drawn from them are likely to be more meaningful and appropriate. Generally, respondents assessed the functionality of the software as "strongly agree" with a weighted mean of 4.32 which means that the software is recommended for teaching business statistics in particular.

Table 5. Reasons of the respondents on the utilization of the software in the classroom

Items	Weighted Mean	Descriptive Value
1. I feel more confident in my abilities in solving basic statistics problems when using the software.	4.15	Agree
2. I am more comfortable using the software in statistics class.	4.12	Agree
3. I enjoy using the software in learning business statistics.	4.10	Agree
4. I enjoy working in group rather than alone in statistics class.	4.37	Strongly Agree
5. I always participate in group/class activity.	4.20	Strongly Agree
6. In the past, I had enjoyed math class prior to using the software.	3.89	Agree
7. It improves my understanding on the material.	4.27	Strongly Agree
8. I received high scores in using the software.	3.87	Agree
GRAND MEAN	4.12	Agree



Table 5 shows the various reasons of the respondents in using SPSS in the classroom. Result shows that the respondents agreed that they feel more confident in their abilities in solving basic statistics problems when using the software rather than the manual computations. They also feel more comfortable and they enjoyed using the software compared to other topics in statistics without the use of software. On the other hand, respondents replied 'strongly agree' when it comes to collaboration method. Respondents enjoyed working in a group and always participated in group/class activities. Lastly, respondents marked strongly agree that the software improves their understanding on the materials that resulted in receiving high scores in their examinations. Generally, respondents assessed as agree with a grand weighted mean of 4.12 on their preferences in using the software rather than using the manual computations.

Table 6. Assessment of the students on the competency of the teacher in the utilization of the SPSS in teaching statistics

Items	Weighted Mean	Descriptive Value
1. The teacher helps the students in using the software.	4.36	Strongly Agree
2. The teacher explains basic concepts and features of the software before using.	4.36	Strongly Agree
3. The teacher answers questions by the students.	4.36	Strongly Agree
4. The teacher checks the output/drafts of the students.	4.51	Strongly Agree
5. The teacher records the output of the students.	4.38	Strongly Agree
6. The teacher has a sufficient knowledge about the software.	4.41	Strongly Agree
7. The teacher helps the students in preparing tables for the data.	4.37	Strongly Agree
8. The teacher helps the student in interpreting the statistical results.	4.34	Strongly Agree
GRAND MEAN	4.39	Strongly Agree

Table 6 presents the assessment of the students on the competency of the teacher in the utilization of the SPSS as facilitator in teaching and learning process. As gleaned from the table, respondents marked strongly agree in all items with a grand mean of 4.39 under this indicator which shows that the teacher is responsive in teaching and learning process. Hence, the teacher monitors and guides the student that makes the teacher approachable enough in facilitating the students in the utilization of the software.



Table 7. Test of differences between sex and student's assessment on the software

Items	t-value	Df	p-value	Decision
1. The software is user friendly.	-1.146	64.252	0.256	NS
2. The software can make statistics concepts easier to understand.	-1.827	51.322	0.074	NS
3. The software facilitates in solving both descriptive and inferential problems.	.134	44.845	0.894	NS
4. I prefer the use of the software rather than manual computation.	-.886	50.481	0.380	NS
5. The data is easy to interpret in using the software.	-.223	50.851	0.825	NS
6. The software is important in learning business statistics course.	-.470	47.637	0.640	NS
7. The software gives precise and reliable information from the data.	-.570	59.436	0.571	NS
8. The software should be used also to other statistics class.	-1.217	55.217	0.229	NS

Table 7 shows the significant difference of the assessment of the students on the software with regards to sex. Statistically, since all the p-values > 0.05, hence, the decision is not significant means that assessment of the students is not related to their sex. This further proves that males have the same assessment to females.

Table 8. Correlation between age and student's assessment on the software

Items	N	r-value	p-value	decision
1. The software is user friendly.	132	0.035	0.693	NS
2. The software can make statistics concepts easier to understand.	132	-0.021	0.812	NS
3. The software facilitates in solving both descriptive and inferential problems.	132	-0.011	0.902	NS
4. I prefer the use of the software rather than manual computation.	132	0.047	0.590	NS
5. The data is easy to interpret in using the software.	132	0.031	0.727	NS
6. The software is important in learning business statistics course.	132	-0.026	0.763	NS
7. The software gives precise and reliable information from the data.	132	0.022	0.805	NS
8. The software should be used also to other statistics class.	132	0.043	0.628	NS



As reflected in table 8, the assessment of the respondents on the software has no significant relationship as to their age since all the p-values > 0.05 . This implies further that on the age bracket of the respondents has no implication on their assessment on the software.

Table 9. ANOVA between program and student's assessment on the software

Items		MS	SS	Df	F-value	p-value	decision
1. The software is user friendly.	Between groups	.143	.858	6	.424	.862	NS
	Within groups	.337	42.112	125			
2. The software can make statistics concepts easier to understand.	Between groups	.415	2.492	6	1.220	.301	NS
	Within groups	.341	42.569	125			
3. The software facilitates in solving both descriptive and inferential problems.	Between groups	1.385	8.308	6	3.688	.201	NS
	Within groups	.375	46.935	125			
4. I prefer the use of the software rather than manual computation.	Between groups	.767	4.599	6	1.611	.149	NS
	Within groups	.476	59.484	125			
5. The data is easy to interpret in using the software.	Between groups	.182	1.091	6	.427	.860	NS
	Within groups	.425	53.174	125			
6. The software is important in learning business statistics course.	Between groups	.544	3.265	6	1.649	.139	NS
	Within groups	.330	41.251	125			
7. The software gives precise and reliable information from the data.	Between groups	.331	1.984	6	.791	.579	NS
	Within groups	.418	52.281	125			
8. The software should be used also to other statistics class.	Between groups	.325	1.948	6	.831	.548	NS
	Within groups	.391	48.862	125			

In table 9, shows that relationship between the program and student's assessment on the software. It reveals that there is no significant relationship ($p > .05$) between the course and



assessment of the respondents on the software. This means that all students have the same assessment regardless of program taken.

CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the study, the data were gathered mostly from female respondents and regular BS Accounting Technology students and BSBA Marketing Management.

On the assessment of the students based on the functionality of the software, generally, the respondents assessed as “strongly agree”. This shows that with the utilization of the software, the software helps them to understand statistics concepts, be able to solve descriptive and inferential questions accurately and quickly since the software provides precise and reliable information from the data. This made them to conclude and prefer using the software rather than the manual computations. Students responded strongly that the software is vital in learning business statistics course and be recommended to other statistics class as well.

On the preferences of the respondents in the utilization of the software, result shows that the respondents agreed that they feel more confident in their abilities in solving basic statistics problems when using the software rather than the manual computations. Study also shows that with the utilization of the software student’s collaboration is very high since they enjoyed much working in a group and always participate in group activity. As the result, students received high scores upon using the software.

Assessment of the respondents in their teacher’s competency as facilitator in teaching and learning process on the utilization of the software, as the result from the study, the teacher has a big role in monitoring and guiding the students in facilitating and directing the students on the use of the software.

Statistically, profile of the respondents has no significant difference on the assessment of the students on the utilization of the software.

Finally, the SPSS software is highly recommended to facilitate teaching and learning process especially for outcome-based higher education.

REFERENCES

1. Andrews, Stewart (2010). Statistical Software for Teaching: Relevant, Appropriate and Affordable. *International Association of Statistical Education (IASE)*. ICOTS8 (2010) Invited Paper. July, 2010.



2. Bude, et.al (2007). Student's Achievement in a Statistics Course in Relational to Motivational Aspects and Study Behaviour. *Statistics Education Research Journal*. May 2007.
3. Chance, B., Ben-ZviD., Garfield,J, &Medina, E (2007). The role of technology in improving student learning statistics, *Technology Innovations in Statistics Education*, 1(1). Retrieved February 2010.
4. Chen, Shaoying (2010). Application of SPSS in Analyzing the Effect of English Vocabulary Strategy Instruction. *English Language Teaching Journal*. Volume 3, No.2.June 2010.
5. Garfield, J and Ben-Zvi (2008), D. Preparing School Teachers to develop Students' Statistical Reasoning. *Teaching Statistics in School Mathematics*.
6. Hammerman, J.K, and Rubin, Andee. Strategies for Managing Statistical Complexity with New Software Tools. *Statistics Education Research Journal*. Novemember, 2004.
7. Jatnika, Ratha. The Effect of SPSS Course To Students Attitudes Towards Statistics And Achievement In Statistics. *International Journal of Information and Education Technology*, Vol.5, No.11, November 2015.
8. Lancster, Gillian (2010). Communicating the Value of Statistical Thinking in Research. *International Statistics Institute*. Presented in ICOTS, July 2010.
9. Nayak, Pratima, et.al (2013). The Role of Technology in Teaching-Learning Mathematics.
10. Ramirez, C., Schau, C., and Emmioglu, Esmá C. (2012). The Importance of Attitudes in Statistics Education . *Statistics Education Research Journal*. Novemeber 2012.
11. Reston, E. (2013). An Outcome-Based Framework for Technology integration in Higher Education Statistics Curricula for Non-Majors.
12. Tatar, Enver. The Effect of Dynamic Software on Prospective Mathematics Teachers' Perceptions Regarding Information and Communication Technology (2013). *Australian Journal of Teacher Education*. Volume 28, Article 1, Issue 12, 2013.
13. <http://www.uwindsor.ca/its/sites/uwindsor.ca.its/files/What%20is%20SPSS.pdf>