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Improving Skill of SPSS Software For Biology 3rd Year Students of Samara University in 2021: Action Research*

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Abstract

SPSS helped revolutionize research practices in the social sciences. Students in Department of Biology think that SPSS statistical software is very difficult for them, because SPSS statistical software is viewed as a hard science than Biology which is viewed as a soft science. The main aim of this action research is to improve the skill of SPSS software' in the case of biology of third year Biology section A students at the Samara University in 2021. Among all 46, 35 students were included since they are present on the day of training class. The data from the student's questionnaire were tabulated and analyzed using descriptive statistical method. For the purpose of analyzing the collected data SPSS version 20 software was used. From the summary statistics of the total 35 students the proportion of male and female students is 5(14.3%) and 30(85.7%) respectively. The residence of the student majority 22 (62.9%) comes from rural areas. Of students 23 (65.7%) are motivated for their future research works to use it for statistical data analysis and graphics. There is high demand SPSS training programs for students as it is mandatory for data analysis. Software training programs like SPSS should be proposed on the curriculum to improve the skill of the students.

Keywords: data analysis, Ethiopia, SPSS, statistics, statistical Softwares

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1. Background

1.1 Introduction

Educational assessment like improving SPSS software requires a clear conception of all intended learning outcomes of the instruction and a variety of assessment procedures (Redondo, 2019). Educational institutions have the right to independently determine the paths of their development, the methods and goals of their achievement (Suray et al., 2019). It is important to assess the students attitude and performance on SPSS. SPSS is software which is widely used for quantitative research method specially to develop the explanation of social science research in to an analytical way (Frey, 2017). SPSS is used extensively by academic researchers as a tool for quickly analyzing quantitative data. It is a popular and comprehensive data analysis package containing a multitude of features designed to facilitate the execution of a wide range of statistical analyses. It was developed for the analysis of data in the social sciences. SPSS means Statistical Package for Social Science and was first launched in 1968 (Gogoi, 2020). SPSS (Statistical Package for Social Sciences) developed by IBM, is the most widely used software to analyze quantitative data. SPSS is taught as a comprehensive course to all researchers. It is mandatory, especially at postgraduate level. SPSS is effort and time saving tool to analyze large amounts of data. It provides analytical skill to assist students in research work (Lodhi & Management, 2016). Since SPSS was acquired by IBM in 2009, it's officially known as IBM SPSS Statistics but most users still just refer to it as "SPSS". It is well suited to analyzing data from surveys and database (IBM, 2009). SPSS helped revolutionize research practices in the social sciences. As an easy to use and comprehensive statistics program it enabled researchers to conduct complex statistical analyses on big datasets on their own instead of being dependent on statisticians who knew how to operate user-unfriendly programs on mainframe computers (Daniel Arkkelin, 2014). It is believed that biostatistics course in helping Students to build their confidence in their ability to manipulate data analysis. The results suggest that this has been accomplished and that our students feel more at ease conducting and interpreting statistical data and procedures. This is seen both in the subjective part of our study, as well as in the objective part in which the improvement was very impressive (Perry et al., 2014).There is no question that business, education, and all fields of science have come to rely heavily on the computer. This dependence has become so great that it is no longer possible to understand social and health science research without substantial knowledge of statistics and without at least some rudimentary understanding of statistical software. The main aim of this action research is to improve the skill of SPSS software' in the case of biology of third year Biology section A students at the Samara University, Ethiopia in 2021.

1.2 Statement of the problem

Students in the department of biology think that SPSS statistical software is very difficult for them, because SPSS statistical software is viewed as a hard science than Biology which is viewed as a soft science. Many of us who teach statistical software have to work hard in improving our instruction. Part of that effort needs to be directed toward developing and using good assessments. Theory, action research, and the experiences of both teachers and students of Biology indicate that attitudes toward statistics are important in the teaching-learning process. The researcher prepared the following leading questions.

- What is the importance of SPSS software for the students?
- What are the major problems with students' skill of SPSS software?
- How can we reduce/ minimize problems towards the skills of students about the SPSS software?

1.3 Objective of the action research

1.3.1. General objective

The general objective of this action research is to improve the skill of SPSS software' in the case of department of third year Biology section A students at Samara University.

1.3.2. Specific objectives

- To realize the need and importance of SPSS software for the students.
- To investigate problems around the software that frequently faced most students.
- To take an action so as to improve those software problems after completing this study.

2. RESEARCH METHODOLOGY

2.1. Target population

The population that consists of this study was third year Biology Section A students in Samara University. There are 46 students are being available in this section and among them are 34 females and 12 students are grouped under the male.

2.2. Inclusion and exclusion criteria

Among all 46 students in Biology sections A students, 35 students were included since they are present on the day of training class. Hence, the remaining 11 were excluded due to the absence of the class.

2.3. Data collecting instruments

The researchers used a questionnaire to obtain information on the problem identified from a source of the data. A questionnaire having 11 items was prepared for students to elicit responses on how they used to learn SPSS software in relation to improving their skills. The items in the questionnaire were based on socio-demographic and knowledge about SPSS software.

2.4. Data analysis technique

Descriptive statistics are used to summarize data in an organized manner by describing the study variables in a sample or population. Calculating descriptive statistics represents a vital first step when conducting research and should always occur before making inferential statistical comparisons (Yellapu, 2018). It is one of frequently used research methods (Hsu, 2005). An initial step when describing categorical data is to count the number of observations in each category and express them as percentages of the total sample size. The other method is the chi-square test of association which helps to know the whether the training outcome measures are associated with the back ground characteristics (variables). Accordingly, the collected data were analyzed and interpreted. The data from the student's questionnaire were tabulated and analyzed using percentage and descriptions were also given.

2.5 Statistical software

For the purpose of analyzing the given data the researcher has been used SPSS version 20 software and alpha 0.05 is used for test statistical tests.

2.6 Action planning and strategy

2.6.1 Activities/Action strategies

Based on the findings elaborated above, the following points are explained,

- Give software training class for the targeted students.
- Provide short and brief notes about SPSS software.
- Adjust students centered approach, especially by the peer teaching, learning method in order to improve student SPSS software skill.
- Create a conductive environment for training in order to support them to improve basic knowledge about SPSS manipulation.
- Give them a chance to entering data and creating variables into SPSS software and to identify the problem that were made by them.

3. RESULTS AND DISCUSSIONS

3.1. Results

In this section, the results obtained through the questionnaire from the data source (students) are presented and analyzed.

3.1.1. Descriptive Statistics

Based on Table 1, the total 35 students the proportion of male and female students is 5(14.3%) and 30(85.7%) respectively. From this we can understand that most of the students are females in 3rd year biology section A class. When we see the residence of the student majority 22 (62.9%) are coming from rural areas. The age distribution of students in the class is majority 30(85.7%) are in the age interval 21-25 years. The educational level of families of students is majority 17(48.6%) are not educated, 13(37.1%) are high school and above and 5(14%) are elementary. As the common course computer course is given in the class. This may have an effect on the attitude of students on SPSS and other software. The other is the accessibility of computer personally or at university is answered no accounts 27 (77.1). This is a great problem and should be alleviated as much as possible. When we see the satisfaction of students after the training given in this program majority 30(85.7%) are satisfied. From this we can understand that such training software is important to create such qualified manpower. The attitude of students on SPSS after training given in this program almost all 35 (100%) attitude is positive. From this we can understand that such training software is important to change the attitude of students.The level of awareness of students towards SPSS software after training majority 17(48.6%) is good, 10 (28.6%) are Excellent and 8 (22.9) are awarded on a very good level. The basic introductory knowledge about SPSS software majority 25(71.4%) gets the basic knowledge from the training. So such training should continue better development of manpower for the country. Finally, the students are highly 23(65.7%) are motivated for their future research works to use it for statistical data analysis and graphics.

Table 1 : Summary statistics, results of socio-demographic and knowledge, assessing variation of SPSS software for biology 3rd year students in the Samara University in 2021

Variables	Category	Freq	%
Sex	Male	5	14.3
	Female	30	85.7
Residence	Urban	13	37.1
	Rural	22	62.9
Age of students in years	16-20	0	0
	21-25	30	85.7
	>=26	5	14.3
Family education level	Not educated	17	48.6
	Elementary	5	14.3
	High school & above	13	37.1
Computer course take	Yes	35	100
	No	0	0
Computer access	Yes	8	22.9
	No	27	77.1
Satisfaction by training	Yes	30	85.7
	No	5	14.3
Attitude	Positive	35	100
	Negative	0	0
Level of awareness after	Good	17	48.6
	v.good	8	22.9
	Excellent	10	28.6
Basic knowledge	Yes	25	71.4
	No	10	28.6
Future motivation	Yes	23	65.7
	No	12	34.3

3.1.2. Chi square test of association

The Chi square test of association is applied to see the association of outcome of the training and background characteristics of biology 3rd year students in Samara University, 2021. The detail chisquare test result is stated in Table 2 as shown below.

Table 2 Chi square test summary result from cross tabulations of background characteristics of students and SPSS training outcome measures in Samara university, 2021.

Background / Outcome measures	**Age** Chi square	DF	P – value	**Residence** Chi square	DF	P-value	**Sex** Chi square	DF	P-value
Satisfaction	35	1	**0.000**	3.44	1	0.063	5.50	1	**0.019**
Level of awareness	6.17	2	**0.046**	19.88	2	**0.000**	18.51	2	**0.000**
Knowledge	14.58	1	**0.000**	0.99	1	0.319	13.22	1	**0.000**
Motivation	11.18	1	**0.001**	10.79	1	**0.001**	0.697	1	0.404

Background / Outcome measures	**Family level** Chi square	DF	**Education** P – value	**Access computers** Chi square	DF	P value
Satisfaction	35	2	**0.000**	1.72	1	1.89
Level of awareness	27.31	4	**0.000**	35	2	**0.000**
Knowledge	19.92	2	**0.000**	4.14	1	**0.042**
Motivation	16.72	2	**0.000**	5.41	1	**0.000**

As we have seen of Table 2, summary above of cross tabulation chi square test table students background characteristics (Variables) have a great association with the outcome measures of the SPSS training at the university. It is known that the p-value less than 0.05 indicates that there is an association. Accordingly, Age is associated with satisfaction, the level of awareness, basic knowledge and future motivation. Residence associated with the level of awareness and future motivation. Sex associated with satisfaction, the level of awareness and basic knowledge obtained. A family education level associated with satisfaction, the level of awareness, basic knowledge and motivation. Access of computer is associated with, the level of awareness, basic knowledge obtained and future motivation.

4.1. Discussion

The result shows that there is significant difference between participant's ability in processing the quantitative data by using SPSS between before and after following the activity of SPSS training. The introduction of training into SPSS software has been shown to have a positive impact on student motivation in terms of learning as well as enjoyment and appreciation for the discipline(Meletiou-Mavrotheris, M., Lee, C. & Fouladi, 2007).The attitude of students on SPSS after training given in this program almost all 35 (100%) attitude is positive.This in line with several papers have shown through qualitative research, using focus groups and interviews, that although

the student population may be inclined to prefer a skill of SPSS software to begin with, over time this attitude changes (Kenny, 2002) students eventually voice a desire for change in terms of more online learning opportunities. From this we can understand that such training software is important to change the attitude of students. From this study, the students are highly 23 (65.7%) are motivated for their future research works to use it for statistical data analysis and graphics. On the other hand age is associated with satisfaction, the level of awareness, basic knowledge and future motivation. Residence associated with the level of awareness and future motivation. Sex associated with satisfaction, the level of awareness and basic knowledge obtained. A family education level associated with satisfaction, the level of awareness, basic knowledge and motivation. Access of computer is associated with, the level of awareness, basic knowledge obtained and future motivation.

4.2. Conclusion

The finding of this research gives evidence to the importance of the trainings for the improvement of skill of students on statistical software. It is known that for any data analysis of the research knowledge of statistical software is very mandatory. Hence the identified problems like, accessibility and availability of computers as well as the computer curses given to the students in the class assessed. As we have seen from the chi square test of association students background characteristics (Variables) have a great association with the outcome measures of the SPSS training at the university. On the other hand the trainings like this action research program may improve the basic knowledge as well as the motivation of students for the future on the research works. Hence we concluded that the SPSS training vital for the improvement of skills of SPSS software.

4. 2 Recommendation

Based on the findings in this action research the following recommendations are forwarded by the researchers.

For Samara university:

- The accessibility of computers in each laboratory class may increase the knowledge of software of students so that requires focus.
- Software training programs like SPSS should be proposed in their curriculum.

For students:

- The student should try to develop their knowledge of software by participating different trading's in university, online like YouTube is vital.
- Do not fear statistical software, trying makes perfect.

For researchers:

- The researcher in the areas of software's and data analysis should increase the habit of career development centers as well as for students by giving continues training programs.

- Further analysis in the identification of significant factors in the stated problem like that regression analysis is important.

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