

Journal of
Creative Practices in Language Learning and Teaching (CPLT) Special Issue: *Generating New
Knowledge through Best Practices in Computing and Mathematical Sciences*
Volume 7, Number 1, 2019

Facilitating Statistical Software Using SS E Guide

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Received: 22 May 2018. Accepted: 15 Feb 2019/Published online: 28 Feb 2019
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ABSTRACT

The process of data analysis for the purpose of research is very important and this process sometimes is very complicated, especially for researchers who do not have any statistical basis. We developed specific software to analyze the data. The problem occurs when students are not familiar with such software. The most important process in the analysis of data is to run the correct analysis. For example, analysis of mean between samples can be done either using parametric or non-parametric test. If students choose the wrong analysis, this will lead to the inappropriate conclusion. The second problem face by the students is how to use statistical software. Some software will produce output even if the method chosen is not suitable. So this E Guide application is intended to facilitate two things: how to choose the appropriate analysis data and how to use statistical software to get the correct output. E Guide also provides interpretation of output from example provided.

Keywords: Data analysis. Statistical software. E Guide

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1 INTRODUCTION

Research will always involve data analysis. Some students are not majoring in statistics but they have to learn data analysis. The most important process in the analysis of data is to run the correct analysis. For example, analysis mean between samples can be done either using parametric or non-parametric test. If students choose the wrong analysis, this will lead to the inappropriate conclusion. The second problem face by the students is how to use statistical software. Some software will produce output even if the method chosen is not suitable. So this e Guide applications is in-tended to facilitate two things, how to choose the appropriate analysis data and how to use statistical software to get the correct output. In UiTM, there is a several courses where a students have to conduct a research either it's a part of the syllabus or for final year project. The process of data analysis for the purpose of research is very important and this process sometimes is very complicated, especially for students who do not have any statistical basis. Students will use specific software to analyze the data. The problem occurs when students do not familiar use such software.

We have teaching statistical analysis for both statistic students and non-statistics student since 2003. We found that students have the difficulty to run the right analysis using software and they have a problem to search about the procedure in the manual book. So far, students use the manual book in the lab as a guide to analyzing data. This traditional method sometimes becomes boring. So we are thinking of introducing new methods as an alternative to traditional method.

Innovation ideas to change delivery method in teaching can help educators to customize the educational process and can improve the effectiveness in teaching and learning process [1][2]. Among many criteria, creativity element has been major concern in teaching and therefore teachers have to expose their students with a creative environment in classes. For example, the introduction of visual tool namely as Packet Tracer can help lecturers to deliver networking knowledge and theories effectively [1]. An interesting result has been reported by [2] when the researchers used video-based resources in teaching statistics. The study showed a significant difference in the impact of video resources between postgraduates and undergraduates students. Similarly, video-based resources as a technological tool in teaching and learning have also returned some positive impacts on student learning and understanding when applied on courses like statistics [3] and mathematics [4].

2 BACKGROUND

2.1 Introduction

SS E Guide is an application that will help users especially students, lecturers and researchers in analyzing data using Statistical Software. SS E Guide products only focus on software that is synonymous with the present data analysis which is SPSS This product will guide the users directly to a correct and quick way to use SPSS. Usually the users need to read the manual or

sometimes the users' use the easy way by just clicking the button without knowing that the result from the analyzing process is wrong. Therefore, SS E Guide will help the user in choosing the right way to analyze data using the right procedure hence getting correct results.

2.2 The development of Statistical Software E Guide

SS E guide is developed using Ms. Excel 2013 with VB Script. No database needed. An application which provides information without any input data or transaction from the user. E guide is developed using excel because to make it user friendly. User target for this application is a student. The objective of application is in lecture room for teaching and learning purposes. So excel is the best software to build the application because everyone have easy access to the software.

Figure 1 show the flow chart of SS E Guide development process. In the development phase of this application, syllabus of selected statistical courses was investigated to identify the type of data analysis involved. Interview sessions were made with lecturers and students to get an initial input regarding what analysis data was appropriately developed in the application. Observation was also conducted in the existing class involving data analysis using SPSS. Observation is aimed at seeing how common methods are used in the classroom, namely the use of manuals as a student guide. We want to see how effective and appropriate the conventional approaches to student learning.

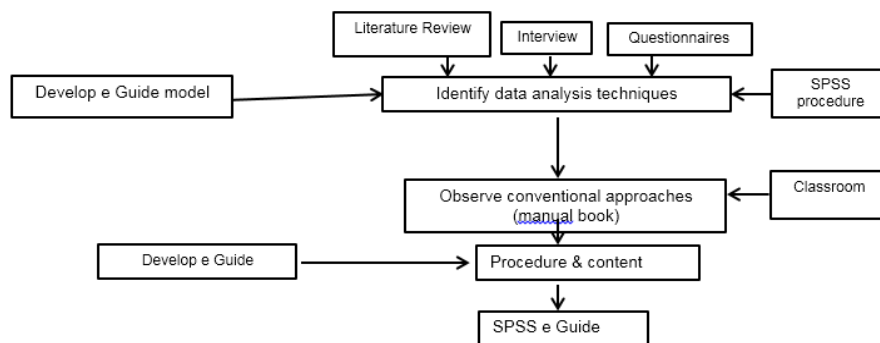


Fig 1: Flow chart SS E Guide development process

What is contained in the guide is a brief note, SPSS procedure and how to analyze the output from SPSS as shown in Figure 2. But what distinguishes it from the manual is its more interactive and easy way.

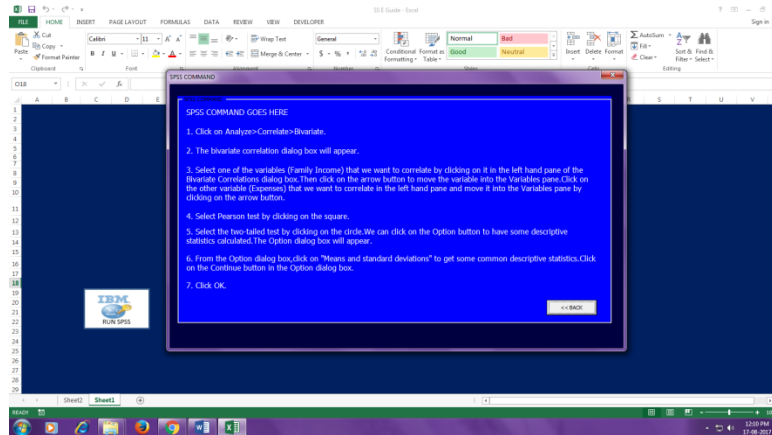


Fig 2: SPSS Command interface

2.3 Comparison study between control group (manual book) and experimental group (e Guide)

Figure 3 show activity involved in comparison study between control group and experimental group. In this study will use a simulation case to collect data .Simulation test will be set up for both control group and experimental group. Simulation test is a set of question that students should run the data analysis using SPSS in order to get the answer. The experimental group will undergo a self-direct lesson using SPSS e Guide Software, while the control group will follow a similar lesson using the conventional classroom learning method by using manual book. The test result and time taken to finish the test were compared using parametric t-test to check the significant of using e Guide in data analysis class. The participants were selected using a stratified random sampling technique. The strata will be program, gender and part. This further study can be used to test is there any relationship between method of teaching and student understanding towards selected course.

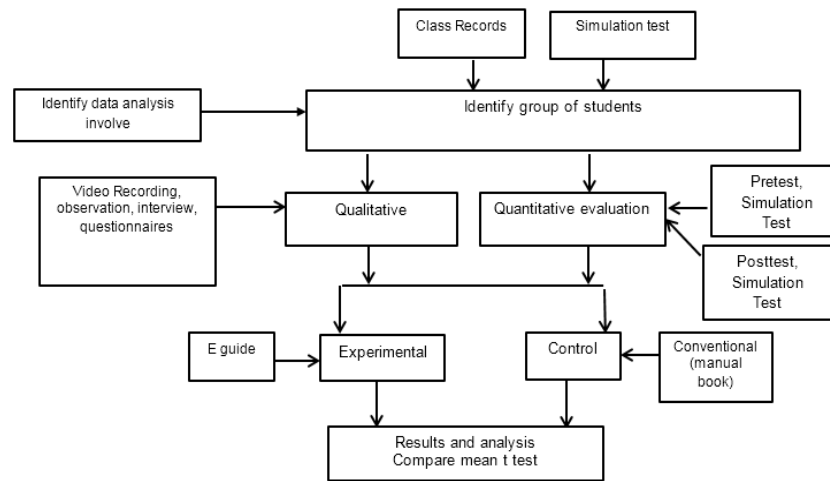


Fig 3: Flow chart show activity involved in comparison study between control group and experimental group

3 TEST RESULT

A total of 41 students participated in the pilot test for this research. The students comprised of Part Five student taking diploma in mathematics. All students involved have been exposed to the use of SPSS in the regression course. Students are divided into two groups. The first group answered the simulation test by using the manual as a reference during the test while the second group used the e guide as a reference. Test scores are calculated for individuals involved. Independent sample t-test analysis is conducted to identify whether there is a difference of score for both groups.

Referring to independent t-test analysis result, there was a significant difference in students score between both group ($t = -2.080$, $p = 0.044 / 2 = 0.022$). As a conclusion, students' scores using e guides exceed students score using manuals. Average score of students using manual is 46.65, lower compared to e guide, 60 marks as shown in Table 1.

Table 1: Mean score between two groups

Type of reference	N	Mean	Std. Deviation	Std. Error Mean
manual	19	46.65	18.224	4.181
e guide	22	60.00	22.254	4.745

4 CONCLUSION

With E Guide, student can run statistical software with interactive guide compare to conventional method using manual book. The interface in E Guide helps student to choose which data analysis that suitable to their data and objective. It solve the problem of doing the wrong type of analysis. E tutorial, which was designed as hand on exercises, leads student in their understanding in using the software. E Guide also can help students in their ability to interpret the software output. Finally, this application is expected to help students in learning process involving data analysis courses to get an excellent results and good grades.

ACKNOWLEDGEMENTS

This research financially supported by Ministry of Education Malaysia and Univesiti Teknologi MARA, Malaysia under ARAS grant scheme with number 600-rRMr/DANA s/3/ARAS (0182/2016)

Ethical Approval

The data collected in this study was approved by the Statistics Department, Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Perak Branch, Tapah Campus.

Informed Consent

Informed consent was obtained from all individual participants included in the study.

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