

# THE USAGE OF SAS SOFTWARE IN TEACHING STATISTICS: UNIVERSITI UTARA MALAYSIA (UUM) EXPERIENCES

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## ABSTRACT

This paper describes the use of SAS software in Universiti Utara Malaysia (UUM). In this university environment, the use of SAS software is looked upon as one of the tools for teaching and research. UUM offers three courses in statistics: Statistics, Introduction to Statistics and Applied Statistics. An undergraduate student is required to take at least one course of statistics. The basic of SAS software is introduced to student that enrolled in the Applied Statistics course. Students are trained to interpret SAS output and they are required to submit a data analysis project by using the SAS software. An exploratory survey was carried out to seek an understanding of the usage of SAS software in teaching statistics. The finding of the survey suggested that 78% of the lecturers still using SAS version 6.04. About 30% of the lecturers attended formal training in SAS and more than 30% of students rated SAS software as tedious and difficult statistical software to use. In order to improve SAS learning in UUM, it is suggested that lecturer should be given formal training in the latest SAS software version and introduction of SAS software to student should be given in Statistics and Introduction to Statistics course.

## INTRODUCTION

In Universiti Utara Malaysia (UUM) environment, the use of SAS software is looked upon as one of the tools for teaching and research. UUM offers three courses in statistics: Statistics, Introduction to Statistics and Applied Statistics. An undergraduate student is required to take at least one course of statistics. The basic of SAS software is introduced to student that enrolled in the Applied Statistics course, which is a prerequisite

for Introduction to Statistics course. Students are trained to interpret SAS output and they are required to submit a data analysis project by using the SAS software. Both versions of SAS, DOS and window versions are installed in computer laboratory for students used. UUM is a registered SAS user since 1990. There are about 50 books and SAS manual in UUM library.

An exploratory survey was carried out to seek an understanding of the usage of SAS software in teaching statistics. The main objective of this survey is to identify students and lecturers perception towards SAS software.

## **METHODOLOGY**

The study involves two groups of respondent namely lecturers who conducting the Applied Statistics course and their students. The method of data collection was via self-administrated questionnaire. Since two main groups of respondents are identified, two set of questionnaires were designed. The first set of questionnaire was distributed to lecturers while the second set of the questionnaire was distributed to students. Census was taken for the lecturer group which only consist of seven people meanwhile for the student group, convenient sampling was used and its involved 360 students. Statistical analysis of the data obtained from the survey was accomplished by using SAS software.

$\chi^2$  test was done to test the following null Hypothesis;

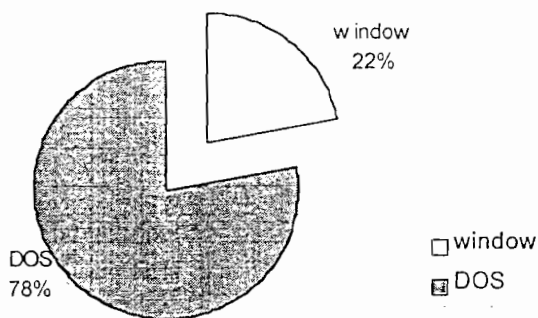
- Ho: No association between level of admission and opinion on SAS
- Ho: No association between result in Introduction to Statistics course and opinion on SAS

- Ho: No association between Cumulative Grade Point Average (CGPA) and opinion on SAS
- Ho: No association between level of agreement and opinion on SAS.

## SURVEY FINDINGS

### Group 1: Lecturers point of view

It was found that only 33% of lecturers attended formal training in SAS. Due to the lack exposure on the latest SAS version, only 22% lecturers use SAS Window version (Figure 1)



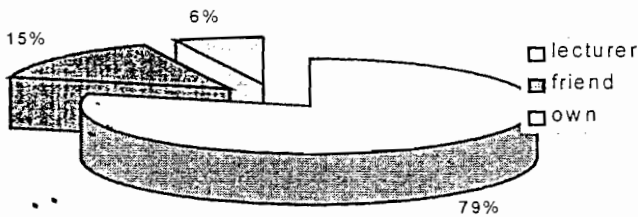
**Figure 1: User according to SAS version**

Only 50% of lecturers using SAS in their research. Seventy one percent of them denote that the usage of SAS is convenient in Applied Statistics course and they encourage students to use SAS in data analysis project. The findings of the survey suggested that most lecturers (83%) consider SAS has higher capability in analyzing data compared to other statistics software. However, 67% of the lecturers experienced SAS is difficult to learn and admit they need more formal training for the advanced level of applied statistics such as multivariate analysis and quality control area.

## Group 2: Students point of view

Eighty three percent of students agree that SAS help in learning Applied Statistics course.

Figure 2 shows that, 79% of the students learn SAS from lecturer, 15% from friend and 6% on their own.



**Figure 2: Sources of learning SAS**

Thirty two percent label SAS as difficult to learn, 48% considered it as moderate and only 20% denote it is easy to learn.

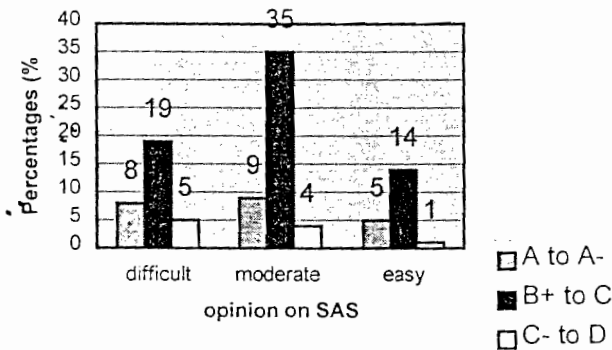
Since all the p value for  $\chi^2$  is 0.001, the hypothesis results are as follows;

- There exists association between level of admission to UUM and opinion on SAS. Majority of students with matriculation and STPM background considered SAS as moderate but many students with Diploma background find it difficult to learn (Table 1).

**Table 1: Opinion on SAS and level of admission**

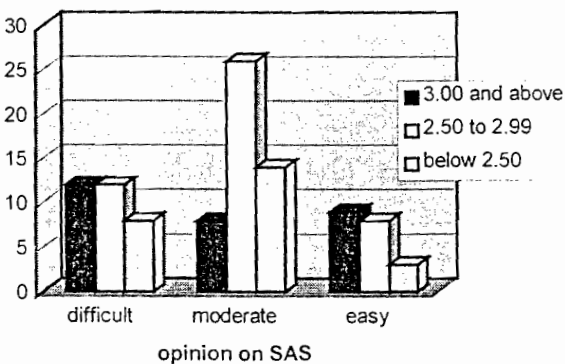
Opinion on SAS/ Level of Admission	Difficult	Moderate	Easy
Matriculation	9%	21%	5%
STPM	17%	23%	12%
Diploma	6%	4%	3%
<b>Total percentages</b>	<b>32%</b>	<b>48%</b>	<b>20%</b>

- There exist association between result of Introduction to Statistics and opinion on SAS. Figure 3 shows that majority of excellence (A to A-) and average (B+ to C) students in Introduction to Statistics Course, identify SAS as moderate to learn but weak (C- to D) students notify SAS as difficult to learn.



**Figure 3: Introduction to Statistics Result and opinion on SAS**

- There exist association between CGPA and opinion on SAS. Those with CGPA 3.00 and above considered SAS as difficult to learn, and those with 2.50 to 2.99 and below 2.50 denote SAS as moderate as shown in Figure 4.



**Figure 4: CGPA and opinion on SAS**

- There exist association between level of agreement and opinion on SAS. Those who agree SAS helps in learning Applied Statistics course, considered SAS as moderate to

learn (41%) but the disagree students, denote SAS as difficult to learn (18%) as shown in Table 2.

**Table 2: Opinion on SAS and level of agreement**

Opinion on SAS/ Level of Agreement	Difficult	Moderate	Easy
Agree	14%	41%	17%
Disagree	18%	7%	3%

## CONCLUSION AND RECOMMENDATION

The findings of the survey suggested that most lecturers and students rated SAS as tedious and difficult software to learn. This perception is due to the programming knowledge required in order to use DOS version of SAS efficiently. In order to improve SAS learning in UUM, it is suggested that lecturer should be given formal training in the latest SAS software version and introduction to SAS software to student should be given at early stage such as in Statistics and Introduction to Statistics course.

## REFERENCES

- Emory, C.W., and Donald R. Cooper, *Business Research Methods*, 4<sup>th</sup> ed. Boston: IRWIN, 1991
- Cody, Ronald P and Jeffrey K. Smith, *Applied Statistics and the SAS programming language*, 4<sup>th</sup> ed. New Jersey: Prentice Hall, 1997
- Conover, W.J., *Practical Nonparametric Statistics*, 2<sup>nd</sup> ed. Texas: Wiley, 1980