

## USE OF STATISTICAL SOFTWARE IN STATISTICS TEACHING: Case Study of Federal Polytechnic Oko, Anambra State

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### Abstract

A survey was conducted in the Department of Statistics, Federal Polytechnic Oko, to ascertain the students' perception on the use of statistical software in teaching. A total of eighty-four (84) questionnaires were administered to all students in all levels in the department. However, only seventy (70) were returned and utilized for the study. Descriptive statistics (frequencies, percentages and charts) was used to analyze responses to questions raised. It was evident from the study that four major software namely MS Excel, SPSS, Minitab and R were readily installed in the systems. However, some computer systems were faulty thereby making the number of available computers inadequate for the students. Although the department has Technologists with sound knowledge of the software, they are not fully employed thereby limiting their zeal in discharging duties effectively. More so, a large proportion of students (44%) do not have proficiency in any of the software which was linked to their lack of personal computers for private practice outside the practical hours. Suggestions were made on how to improve on the use of software in statistics teaching so as to boost the quality of graduates being rolled out each year.

**Keywords:** statistical software, teaching, technology, descriptive statistics.

### Introduction

Statistics is applicable in all fields of endeavor. With the advent of statistical software, manual calculations of complex problems which may be erroneous are rarely used (Masuadi, Mohamud, Almutairi, Alsunaidi, Alswayed and Aldhafeeri, 2021). In a review on how students learn Statistics, Garfield and Ben-Zvi (2007) opined that one of the major areas of interest at the moment is the role of technological tools such as computers, software, graphical calculators and the likes in helping students develop

statistical literacy and reasoning. They also asserted that these technological tools enable students to learn basic statistics concepts, visualize and explore data. It also enabled students to understand abstract ideas.

Zvi, Aricha-Tanir, Lily and Amalia (2014) introduced SPSS Statistical Program in teaching Biostatistics to medical students. The essence was to develop students' skills in computerized data analysis, preparing them to read and interpret data analysis existing in literature and consequently become better equipped to do their theses.

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Abatan and Olayemi (2014) investigated the role of statistical software in data analysis. Their study concluded that software has positive impact on research result. A lot of respondents who enrolled in their study admitted that they could not run analysis without a software and some software are more suited for some kind of analysis than others.

Mazouchová, Jedličková and Hlaváčová (2021) studied the approach adopted by several Czech Universities to use of statistical software in teaching statistics. They utilized an opinion survey of students in at least second year of study as well as fresh university graduates encompassing several disciplines. They observed that the teaching methods used in various statistical courses are outdated (usually theoretical) and unattractive to students. Some students felt that statistics teaching was mainly for purposes of thesis and not for application in the real world. They suggested that before each statistics course is introduced, the students' current knowledge and attitude towards statistics generally should be ascertained while use of dynamic statistical software tools by their teachers improved.

Bhat and Tantray (2021) studied the use of statistical software (SPSS) on the academic researchers and teacher educators. They stated that the software is user-friendly compared with some other existing software and enables researcher to execute large amounts of data smoothly in a simplified process.

### **Statement of Problem**

In Polytechnics, practical is a core area of consideration in accreditation exercises according to the National Board for Technical Education (NBTE). However, students have graduated yearly from the field of Statistics with miniature knowledge of use of software in real life application of the theoretical knowledge gathered. It is indeed appalling for a Polytechnic student to complete his/her National or Higher Diploma without competence in performing as little as descriptive statistics using any of the software. Some schools do not have full-time Technologists who handle the practical aspect of courses taught while some necessary equipment needed in the practical lab are faulty or not adequate. This study therefore seeks to discover the experience so far on the use of statistical software in Statistics teaching using Federal Polytechnic Oko as a case study.

### **Objectives of the Study**

1. Discover the challenges students face in the use of software for statistics learning in Federal Polytechnic Oko.
2. Ascertain students' proficiency on the use of software in practical learning of statistics.

### **Significance of the Study**

Over the years, researchers have written elaborately on the need to use software in teaching and learning Statistics. However, in Federal polytechnic Oko, the use of statistical software in the teaching of statistics has not

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been put into full use. This study aims to address the problems affecting the practical learning of the course, x-ray the software currently in use as well as students' level of knowledge of those software. This will be of huge benefit to students who will have a better equipped laboratory for real life application of statistics and the institution which will confidently boast of full-fledged Statisticians graduated every year.

### Research Questions

1. What are the challenges students face in the use of software for learning statistics in Federal Polytechnic Oko?
2. How proficient are the students on the use of software in practical learning of statistics?

### Research Methodology

An opinion survey was carried out in the Department of Statistics, Federal Polytechnic Oko. A total of eighty-four (84) questionnaires were administered to all students in all levels in the department.

However, only seventy (70) were returned and utilized for the study. Descriptive statistics (frequencies, percentages and charts) was used to analyze responses to questions raised. The questionnaire was validated by an expert using face, construct and content-validity. During the pilot survey, 12 questionnaires were administered to 12 respondents so as to test for the reliability of the research instrument. The reliability of the questionnaire was tested using Cronbach's Reliability test in SPSS. This gave a Cronbach Alpha of 0.82, which made the questionnaire reliable for the study. Five (5) point Likert scale was used and quantified as follows: Strongly Agree (SA)=5, Agree (A)=4, Undecided (UND)=3, Disagree (DA)=2, Strongly Disagree (SD) =1.

### Data Presentation, Analysis and Results

Research Question 1: What are the challenges students face in the use of software for learning statistics in Federal Polytechnic Oko?

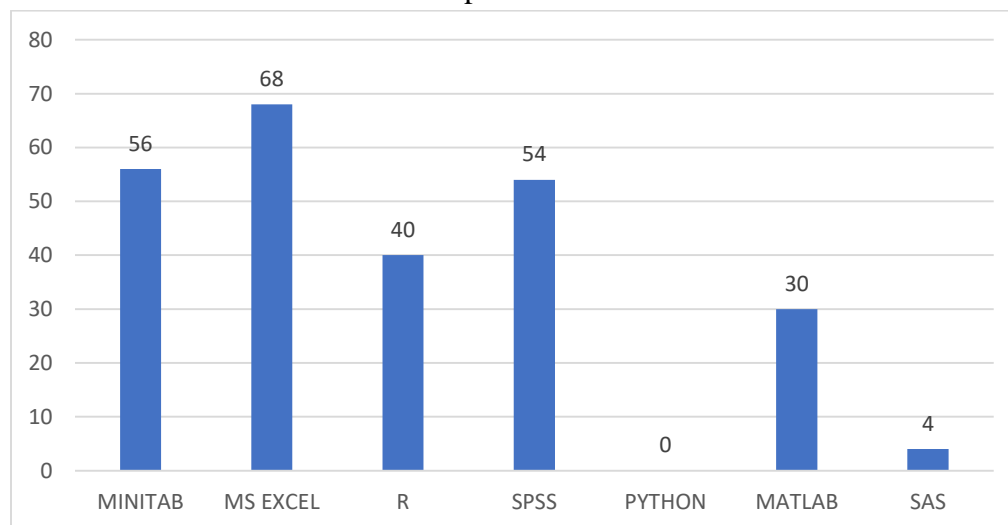


Figure 1: Response on the statistical software available in statistics lab

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Figure 1 shows that four major software namely MS Excel, Minitab, SPSS and R were readily available and installed in the computer systems.

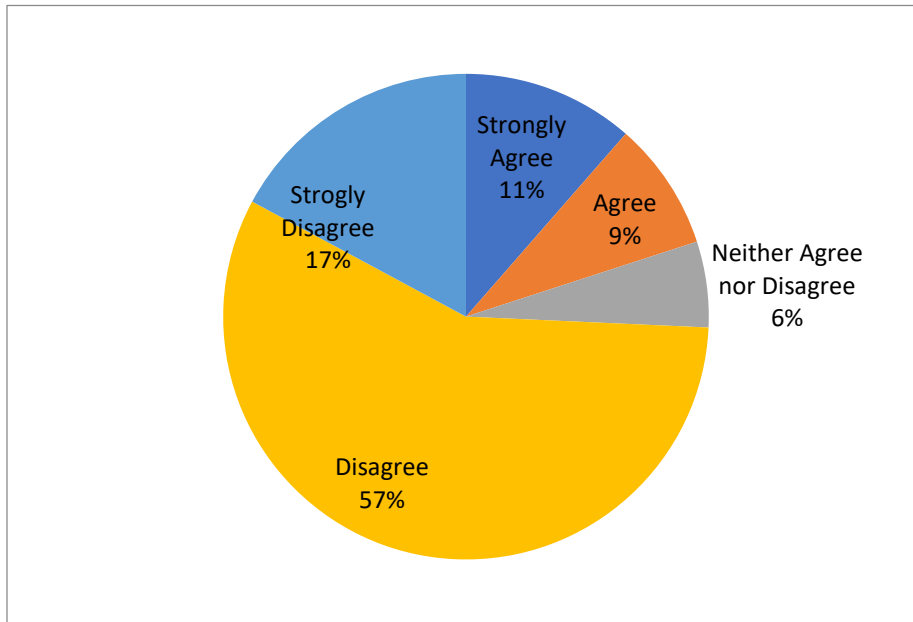


Figure 2: Response on whether the computers available in the Lab are enough for the students

Figure 2 shows that majority of the students did not agree that the computers available in the lab are enough.

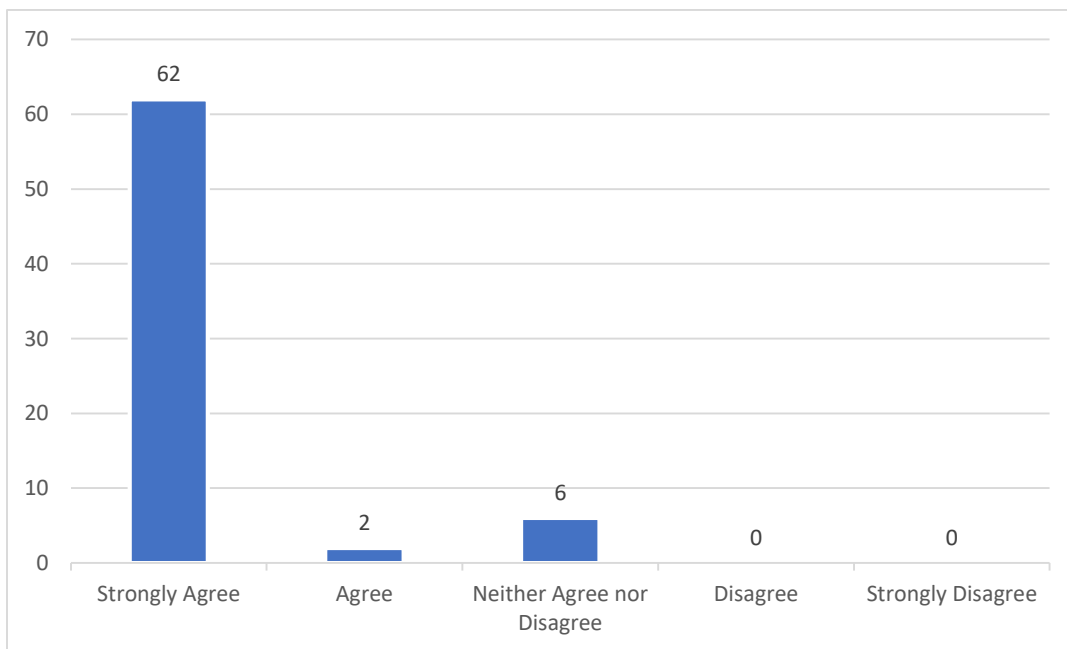


Figure 3: Response on the statement “I am aware that some of the computers are not functional”

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Figure 3 shows that 62 respondents out of 70 strongly agreed that they were aware of some faulty computer systems in the lab.

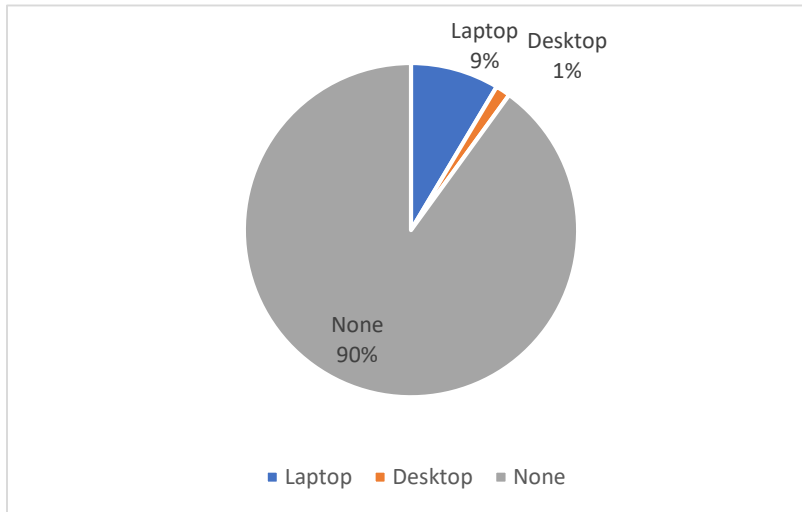


Figure 4: Response on which of the learning tools they have at home

Figure 4 shows that 90% of the students do not have any personal computer at home. They depended majorly on the available ones in the laboratory. Hence, personal practice on lessons learnt was not performed.

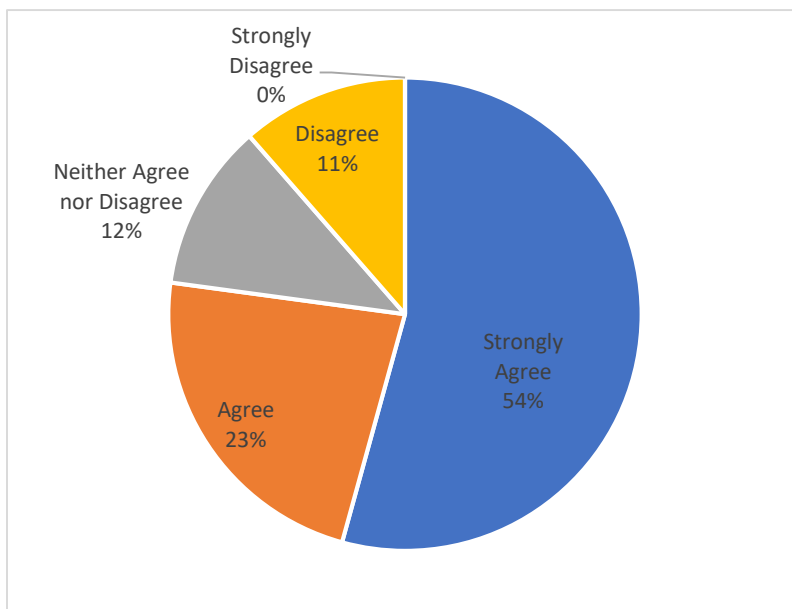


Figure 5: Response on the statement “The department has functional Technologists with sound knowledge of statistical software”

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Figure 5 shows that a greater percentage strongly agreed that the department has functional Technologists with sound knowledge of statistical software.

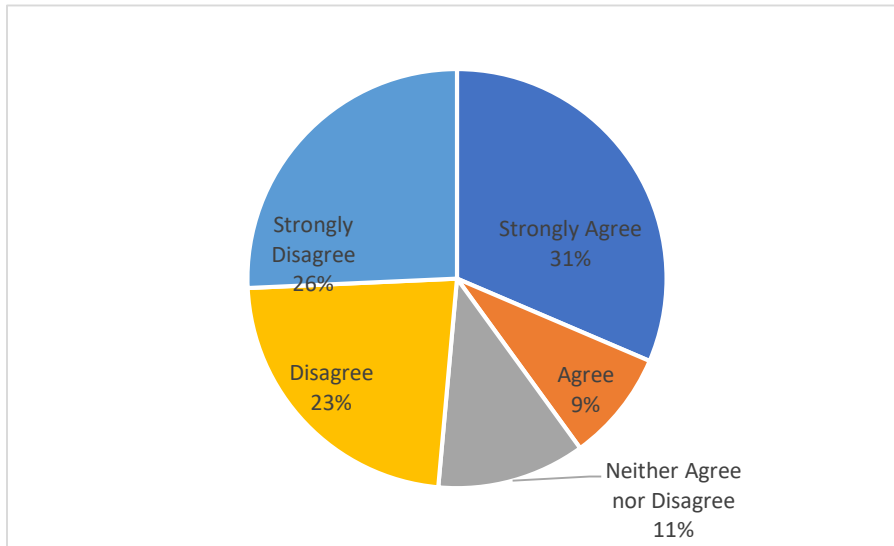


Figure 6: Response on the statement "Because the technologists are not paid, they don't bring out all the needed time to teach the students what they need to know"

Figure 6 shows that 31% strongly agreed that the technologists do not bring out all the needed time to teach the students what they need to know because they are not paid as against a smaller percentage (26%) who strongly disagreed.

**Research Question 2:** How proficient are the students on the use of software in practical learning of statistics?

Figure 7 showed that a greater percentage (44%) could not boast of proficiency in any of the software. However, only 19% could boast of knowledge of SPSS, Minitab (16%), Excel (11%), Tora (9%) and the least is R (1%).

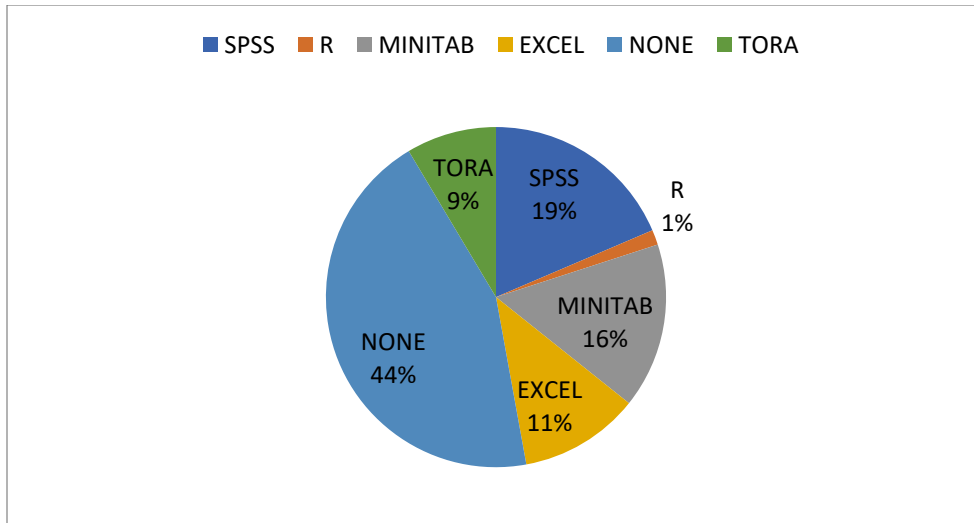


Figure 7: Response on the question “Which statistical software can you boast of?”

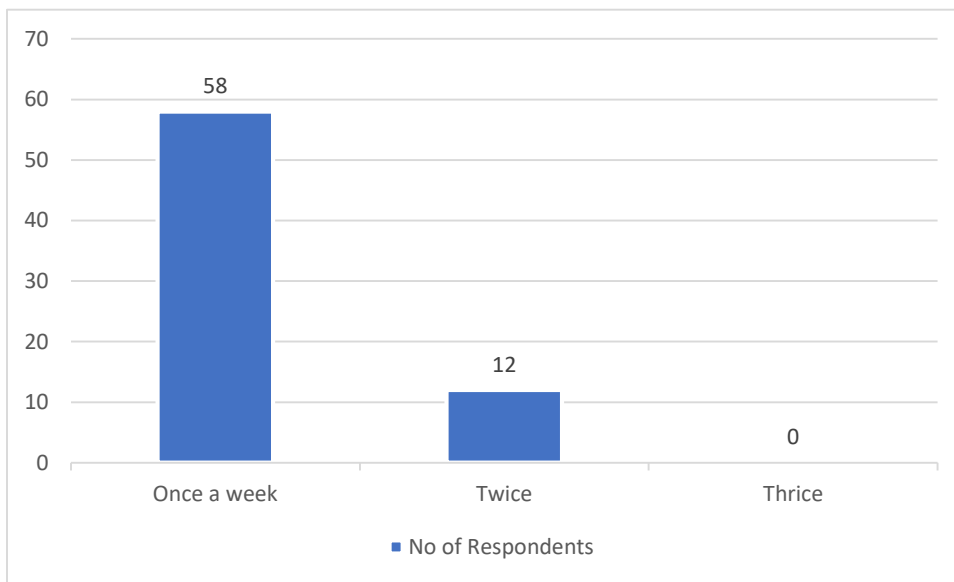


Figure 8: ”Response on "how often do you go for practical classes every week

Figure 8 shows that the greater proportion agreed that practical classes are being held once a week which is too small if the practical aspect of each course should be covered each semester.

### Conclusion

This study concludes that in Federal Polytechnic Oko, the use of statistical

software in the teaching of statistics has not been put into full use. This is due to reasons like faulty computer systems which gave rise to inadequate number of systems available

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for use, presence of Technologists whose expertise are under-utilized because they were not fully employed, the little time allocated to practical sessions per week and the large proportion of students who do not have proficiency in any of the basic software.

### Policy Implication

1. The statistics lab should be adequately equipped by the school management to enhance statistics teaching and learning of statistical software.
2. The Technologists currently working in the statistics lab should be granted

3. full employment so as to boost their zeal in discharging duties effectively. A review of the requirements for entrance into ND (National Diploma) and Higher National Diploma (HND) programmes in the Department is highly recommended to include possession of personal computers by the incoming students. This will aid their personal study and practice of lessons learnt beyond the practical hours.
4. The time allocated for practical sessions should be increased.

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