

# Statistical Application Training for Students for Thesis Preparation

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**ABSTRACT** This research is motivated by the condition that many final-year students still need to complete their studies on time due to a lack of understanding about how to complete a thesis. One of the research approaches used to work on a thesis is quantitative. A quantitative approach is research that analyses data in numbers and attempts to interpret the analysis results. This research uses a type of action research to provide training to final-year students in analyzing data assisted by statistical applications so that it can make it easier for students to complete their thesis. The results of this research are that students' understanding of quantitative data processing has increased compared to before the training was implemented. Students feel this training can help them complete their thesis and graduate on time.

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## 1. INTRODUCTION

Preparing a thesis requires undergraduate students to complete their studies (Newman, 2022; Tedesco-Schneck, 2021). A thesis can also be considered research with a topic adapted to the scientific field one is pursuing (Bellocq, 2020; Robertson, 2017). Students must prepare a systematic research report from the background that underlies the research carried out to the conclusions obtained (Krisdiana, 2019; Lea et al., 2011). Students can use various types of approaches according to the research topic they want to research.

One research approach that can be taken is quantitative (Hasanah et al., 2022; Humaidi et al., 2022; Mustakim et al., 2023). The quantitative approach aims to analyze the data that has been collected (Inganah et al., 2023), both primary data (Mustafa et al., 2023; Vidyastuti et al., 2018) or secondary (Riono et al., 2023) y, in specific ways by the problem formulation and research hypotheses that have been proposed (Usmiyatun et al., 2021).

Quantitative research itself is closely related to statistics (He, 2019). The science of (Wu, 2018). Statistics is used to develop methods used to solve problems that are often related to data or numbers

The data collection process for analysis is

obtained by students in descriptive and inferential statistics (Nisa et al., 2019; Sen, 2017). A data analysis aims to process (Nuryati et al., 2022), present (Novitasari, 2019), and conclude the research results. It can also be used to understand the meaning of a data set, starting from grouping it (Astuti, 2021), processing it, and serving it. To present statistical data, *software* to obtain conclusions from the results of the analysis (Deryhlazov et al., 2017; Ferguson, 2020).

Based on the results of observations and interviews with students and thesis supervisors, several students have difficulty completing their studies on time because they find it challenging to compose their thesis, especially in the data analysis section (Jannah et al., 2023; Widodo et al., 2023). They consider data analysis tricky and take quite a long time, so they choose not to complete it immediately (Lubis et al., 2023; Lutfi & Haris, 2021). However, knowing and understanding how to analyze data properly and correctly can be done quickly and easily. Moreover, nowadays, many data analysis applications are easy to use and produce accurate interpretation results.

Various *software* used by a quantitative researcher such as AMOS (Popovici, 2017), *SmartPLS* (Kariadinata, 2017), *Eviews* (Poon, 2018), *Minitab*

(Birgin, 2021), and SPSS (Triet, 2020). However, the sophistication of these applications cannot be used optimally if users do not understand the steps for analyzing data. To understand, a person must be able to analyze (Zulnaidi, 2017). The ability to analyze or divide something into its parts and explain their relationship (Alhammad, 2018). Every student does not necessarily have the same analytical skills despite receiving the same treatment, so an educator must accompany his students in achieving learning goals.

Learning objectives are obtained directly when programming the thesis course (In'am et al., 2023; R Maghfiroh et al., 2023). This is because the answers in the problem formulation cannot be obtained with the raw data that has been collected. They need to process the raw data through an analysis process, using either descriptive or inferential statistics (E Safitri et al., 2023; Rizqi et al., 2023). Therefore, to be able to complete a thesis on time, a student must be able to develop the ability to analyze data in preparing a thesis

Based on the results of this presentation, considering the importance of the ability to carry out data analysis, the researcher will conduct training using statistical software, namely SPSS and AMOS, to help process and analyze statistical data, which is part of the thesis writing for students of the Faculty of Islamic Economics and Business, UIN Sayyid Ali Rahmatullah Tulungagung.

## 2. METHOD

This community service activity uses a training method, namely by training final-year student service participants to analyze data using statistical applications. The stages of service activities can be seen in Figure 1.

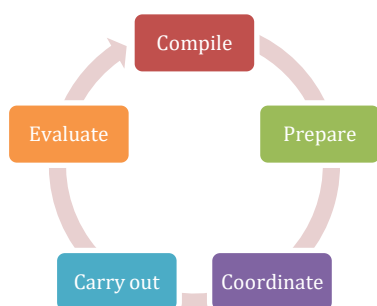


Figure 1 Stages of Statistical Application Training

Figure 1 shows the steps in assisting students in using statistical applications. These steps are explained in five stages: 1) compiling a statistical application training module; 2) preparing the facilities to be used, namely the Statistics Laboratory; 3) coordinating the implementation of these activities, namely students who will take part in the training; 4) organize training activities that will be participated in by students; and 5) implementation of evaluation of training activities.

## 3. RESULTS AND DISCUSSION

### Statistics Applications

Apart from the SPSS application program, there are several other application programs, such as AMOS (Arifin, 2021; Cahyani & Wardoyo, 2022; Ridwan, 2023). AMOS, which stands for Analysis Moment of Structural, is a program designed to complete Structural Equation Modeling (SEM) (Purwanto et al., 2021). AMOS is an easy-to-use operating system that is widely used in Indonesia. The AMOS application program is also integrated with SPSS with one development company, IBM (International et al. Corporation) (Sinambela & Rombe, 2021). The AMOS application facilitates data processing with more complex and detailed multivariate analysis to make interpretation more accurate.

### Need for Statistical Applications

Based on the aim of implementing service activities, namely, to improve students' abilities in using statistical applications for processing thesis data, the stages carried out are as follows:

Needs Analysis. The training participants need this training with the following considerations: 1) . Lack of understanding of how to process and analyze data; 2)—lack of knowledge about using statistical software, both SPSS and AMOS.

### Service Activity Plan

The determination of this service design has considered the following aspects, namely:

- Contents of training materials that are relevant to the needs of the training participants;
- Training participant background, for example, educational background, cultivation experience, age, and so on;
- The material used in this training was created to help participants understand the benefits of using statistical software, SPSS, and AMOS. At this stage, training modules are prepared to support the training. The module also makes it easier for students in research activities to operate SPSS and AMOS statistical applications.

### Implementation of Service

In order to develop the training program, the community service team has attempted to develop this training, both in terms of material and questions and answers in a form relevant to the development of the use of statistics as a tool in economic and business research. The steps taken at this stage are to prepare training facilities and facilities first. Research activities were carried out at the FEBI UIN SATU Statistics laboratory. In this laboratory, the Windows operating system is undoubtedly installed, and the statistical applications used are SPSS and AMOS (Priatna, 2008; Yan et al., 2022).

Next, the participants began carrying out

research based on the guidelines in the training module. The speaker provides a general explanation of the SPSS and AMOS applications and what differentiates them. In the first activity, the training focuses on the SPSS application first. Students who have taken research data for their thesis can use their data to process it using the SPSS application. Meanwhile, students who have not taken data can use fictitious data for practice. Next, after data analysis using the SPSS application, the presenter guides how to read and interpret the data.

#### Devotion Evaluation

In quantitative research, a fundamental thing is proposing and testing research hypotheses. So, the way to interpret the data is whether the proposed hypothesis is accepted or rejected and what conclusions must be drawn after being able to interpret the data. Next, the second meeting was to use the AMOS application to process data (Hospedales et al., 2021; Sinta et al., 2019). The AMOS application requires a more detailed explanation because many students are not yet familiar with this application. There needs to be an explanation of what is meant by a structural model in *multivariate analysis* (Balasopoulou et al., 2017). After this training, students seemed enthusiastic and interested in using the AMOS application in their thesis. The AMOS application can process data with more variables and produce a more detailed structural model. With the AMOS application, research results are considered to have more novelty value than research that has been carried out previously.

Implementation of community service activities related to efforts to increase students' abilities in using statistical applications was carried out in 2 meetings. So, to see the extent of the increase in FEBI UIN SATU students' understanding of the operation of statistical applications, it does not appear to be very significant. However, the main note from the activity organizers is that this training can provide students with insight into various types of research and statistical analysis to process data. This training can also change the thinking of students who think statistics is difficult and are reluctant to carry out quantitative research. Apart from that, it can also be seen that students desire to learn statistics and its applications. So, the goal is to change students' mindsets and views toward quantitative research.

#### 4. CONCLUSION

Community service activities regarding training using statistical applications in preparing theses have gone well. This activity gives students new insights into various types of research and statistical applications. In addition, the perception that statistical analysis is complex has changed. Students feel that the existence of these statistical

applications makes it easier to process and interpret data. Students also begin to understand that statistical application similarities and differences have specific functions and goals. They also understand that each application has advantages and disadvantages, which can be used according to the data to be analyzed.

Training activities using statistical applications can be carried out simultaneously and continuously in order to facilitate students in preparing their thesis. This activity is expected to help students graduate on time and not experience obstacles and difficulties working on their thesis, especially at the data collection, processing, and interpretation stages.

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