



## QUALITY ANALYSIS OF STUDENTS ' RESEARCH IN THE ENGINEERING FACULTY OF IBNU SINA BATAM UNIVERSITY

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### Abstract

This study aims to obtain data about the quality of research conducted by students at the Faculty of Engineering, Ibnu Sina University over the past three years. The population used in this study were students of the Faculty of Engineering at the University of Ibnu Sina from two knowledge groups found at the Faculty of Engineering at the University of Ibnu Sina. Sampling was conducted based on purposive sampling, namely educational research thesis in 2016-2019. From the number of theses that existed during the period 2016-2019, random sampling was conducted for sampling. The research method used is descriptive qualitative by conducting content analysis systematically of documents as data sources. The research quality parameters measured included aspects: theme chosen, presentation and language, structure and logic of the writings, relevance between sub-chapters (Background, Identification, Formulation, Hypothesis, Depth and Extent of Theory, and Research Methods), determination of subjects and research objects, data collection technique; the validity of the instruments used, data analysis, drawing conclusions, and referral sources. The results showed that the quality of educational research conducted by students of the Faculty of Engineering showed that the topics studied did not yet show the presentity and innovation. The topic chosen is still limited to the topics discussed in the previous thesis. The topic of media and learning outcomes dominates as a topic of great interest. When viewed from the object of research the ability to prepare a research thesis for students needs to be improved, especially in methodology, topic selection, language, data collection techniques, instrument preparation, data analysis, and drawing conclusions.

Keywords: Technical research, research quality, qualitative descriptive

### INTRODUCTION

The thesis is one of the compulsory subjects that must be taken by undergraduate students to complete their studies at Ibnu Sina University (UIS). In preparing the thesis, students will be guided by supervisors whose task is to direct students in determining the appropriate title, methodology, theory to solve problems, and discussion. Of the various parts of the thesis, methodology is an important part of scientific research to determine how data collection and processing research is conducted.

The increasingly diverse conditions of research taken in student theses must naturally be addressed from various sides. This research was conducted to analyze the quality of research conducted by students in two study programs at the Faculty of Engineering (FT). This research needs to be done because of the tendency which shows that most of the research conducted by students of the Faculty of Engineering at Ibnu Sina University still revolves around one particular field or theme. Another trend is that students have a dependency on technical problems that have been studied by students before. Many factors cause this to happen. The expected outcome of this research is the distribution of research quality data so that it can be used as a basis for determining factors that cause the quality of technical research at the Faculty of Engineering, Ibnu Sina University, Batam,

## RESEARCH METHODS

The research design that is in accordance with the problem posed is a descriptive research design with a library research approach. This design is expected to be able to provide a factual description of the quality of students' thesis education research at the Faculty of Engineering, Ibnu Sina University. The population of this research is the entire work of the thesis (thesis) at the Faculty of Engineering, Ibnu Sina University which consists of two study programs, namely: (1) Informatics Engineering Study Program, and (2) Industrial Engineering Study Program. This research is limited to thesis 2016 - 2019 in the Faculty of Engineering, University of Ibnu Sina.

The parameters studied include: the theme raised; Presentation and Language; Structure and logic of writing; Relevance between chapters (Background, Identification, Formulation, Hypothesis, Conclusion); Depth and Extent of Theory; Research methods; Determination of Subjects and Research Objects; Data collection technique; The validity of the instruments used; Data analysis; Withdrawal of Conclusions and Sourcebook. To get a picture of the quality available, the data was collected through an analysis of the thesis published by the Faculty of Engineering of the UIS from 2016 to 2019. Based on the results of random sampling conducted, this study was only limited to 30 research thesis in 2016 - 2019. Data analyzed using the Content Analysis method.

## RESULTS AND DISCUSSION

Content analysis of the thesis examined is divided into fourteen assessment indicators, namely: (1) the theme raised; (2) the language used; (3) the structure and logic of writing; (4) identify problems; (5) relevance between sub-chapters; (6) depth and breadth of theory; (7) research methods; (8) determination of research subjects and objects; (9) data collection techniques; (10) instruments used; and (11) data analysis. The details are explained in the following chapters.

### Appointed Theme

The theme is the main idea or thought idea that underlies a study. In the content analysis conducted, the assessment is based on two criteria, namely: (1) the research theme has the latest criteria but is not innovative; (2) the research theme has the latest and innovative criteria. The large percentage can be seen in diagram 1.

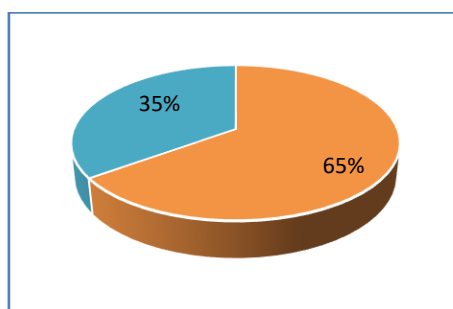


Diagram 1 Percentage of Thesis Based on Appointed Theme

The data in diagram 1 shows that 65% of the research themes have the latest criteria but are not innovative. This means that students conduct research that is widely discussed today such as systems, programs, etc. but what is being studied is not new. But replicas from previous studies. Meanwhile, only 35% of the engineering research reviewed is current and innovative. This means

that engineering research has developed new things and uses experimental methods such as implementing programs or creating new products. The still high level of recency and topic innovation is due to the low interest in reading students in the latest journal references. In addition, the availability of online journals that contain the latest journals has not yet been freely accessible to students.

### **The language used**

The study of the language used refers to indicators: (1) using written language that is quite good, communicative, and coherent; (2) using language that is not communicative and not coherent. A large percentage of the use of language indicators can be seen in diagram 2.

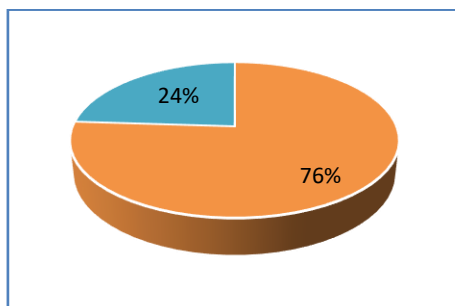


Diagram 2 Percentage of Research-Based on Language Used

Diagram 2 shows that 76% of the thesis studied were using non-communicative and coherent language. This means that students do not understand the writings that can be understood because the majority of students do only take or quote from books or the internet without understanding the consistency of the flow of the writing. So it seems unclear and not coherent. Meanwhile, the data shows that 24% of the 30 theses studied showed that the written language was quite good, communicative, and coherent. Based on the results of the study, the role of the supervisor becomes very important in training students to be able to write a thesis well, communicatively and coherently.

### **Writing Structure and Logic**

The assessment of the structure indicator and the logic of writing refers to the following rules: (1) has a good writing structure, according to the guidelines, mentions the source of the quote, and concludes with not yet own sentence; (2) has a good writing structure, in accordance with the guidelines, mentions the source of the quote, and concludes with his own sentence; A detailed percentage can be seen in diagram 3.

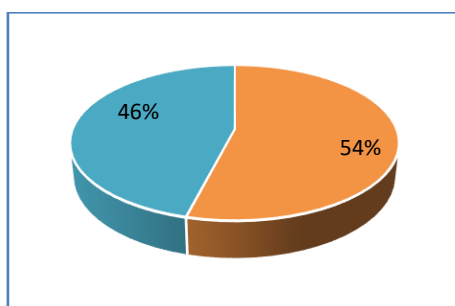


Diagram 3 Thesis Percentage Based on Writing Structure and Logic

Diagram 3 shows data that 54% of the thesis has a good writing structure, according to the guidelines, mention the source of the quote, and conclude with their own sentences. However,

46% of the theses have not used their own sentences to conclude, limited to a collection of various quotations.

### Identifying the Problem

Identification of the problems in this study refers to the indicators: (1) has a focus identification problem, in accordance with the title and background description but has not been supported by accurate data; (2) has a focus problem identification, in accordance with the title and background description and supported by accurate data. The results of the percentage of a thesis based on problem identification can be seen in diagram 4.

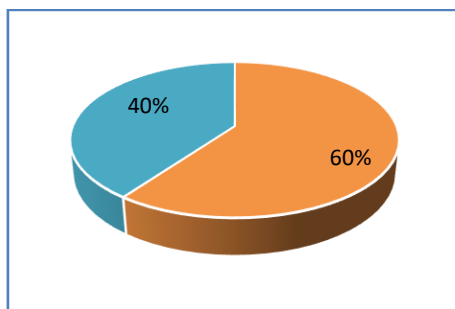


Diagram 4 Thesis Percentage Based on Problem Identification

Diagram 4 shows that 40% of the 30 theses examined had a focus identification problem, in accordance with the title and background description but was not yet supported by accurate data. Lack of data to support research hypotheses is the cause of the topic of research is not yet optimal in accordance with the conditions of the problem. While 60% has been supported by data.

### Relevance Between Sub Chapters

The relevance of the sub-chapters in this study refers to the indicators: (1) have a match between the background, hypothesis, objectives and research results but not yet accompanied by analysis or justification or a more complete discussion; (2) there shows that there is a match between background, hypothesis, objectives and research results but not yet accompanied by complete data; (3) have a match between background, hypothesis, objectives and complete research results both data and discussion. The results of the percentage of a thesis based on the relevance of the sub-chapters can be seen in diagram 5.

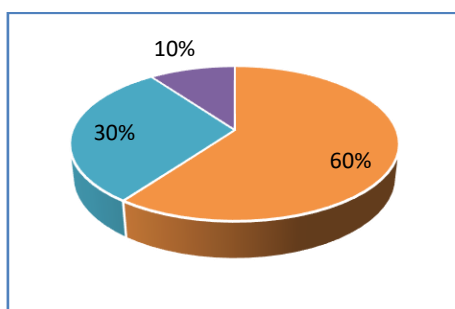


Diagram 5 Thesis Percentage Based on the relevance between subchapters

Diagram 5 shows data that 60% of the 30 theses that were reviewed had a match between the background, hypotheses, objectives and research results but were not accompanied by analysis or justification or a more complete discussion. 30% of the 30 thesis shows that there is a match between background, hypothesis, objectives and research results, but not yet accompanied by

complete data. While only 10% of the 30 theses had a match between the background, hypotheses, objectives and research results that were complete both the data and the discussion.

### Depth and Extent of Theory

The depth and breadth of the theory in this study refer to the indicators: (1) use theory or concept but lack of application to the results of the study; (2) using theories / models / concepts in their research; (3) using the theory or concept completely as a basis for research reference. The results of the percentage of a thesis based on the relevance of the sub-chapters can be seen in diagram 6.

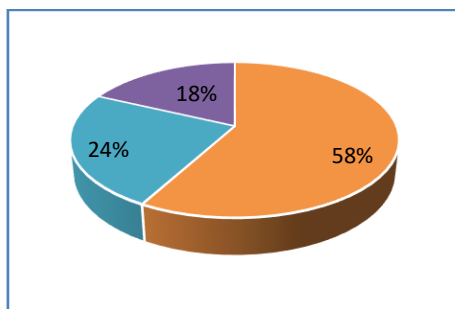


Diagram 6 Thesis Percentage Based on The Depth and Extent of Theory

Diagram 6 shows that 58% of the 30 theses that were reviewed used theory or concept but did not have an application to the research results. This means that students have been able to quote theories or concepts but have not been able to apply theories to the problem under study. The data also shows that 24% of 30 theses use theories/models/ concepts in their research. This means that students have been able to apply theories according to their studies even though they are not yet equipped with complete discussions. Meanwhile, only 18% of the 30 theses studied to use the full theory or concept as a basis for research.

### Research methods

The research method in this study refers to the indicators: (1) using the rules/methods of research that are appropriate but not equipped with an explanation; (2) using correct and correct rules/methods; (3) using the correct methodology but the translation and discussion are not quite right; and (4) not using appropriate and correct research methods. The results of the percentage of a thesis based on the relevance of the sub-chapters can be seen in diagram 7.

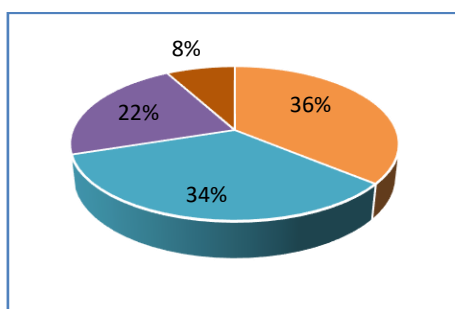


Diagram 7 Thesis Percentage Based on research methods

Based on diagram 7 shows that 36% of the 30 theses that were reviewed use the rules/methods of research that are appropriate but not equipped with an explanation. While those who use the rules/methods that are right and right are only 34% of the 30 theses studied. While 22% of the 30 existing theses used the rules of the correct method but the translation and

discussion were not quite right. Whereas only 8% of the 50 existing theses did not use the right research methods. This means that students actually understand the research method, but need more intensive guidance from the supervisor to be able to use the right method/rules.

### Object of research

The object of research in this study refers to the indicators: (1) using the right object; (2) it is still considered inappropriate but has used the appropriate object. The results of the percentage of a thesis based on the relevance of the sub-chapters can be seen in diagram 8.

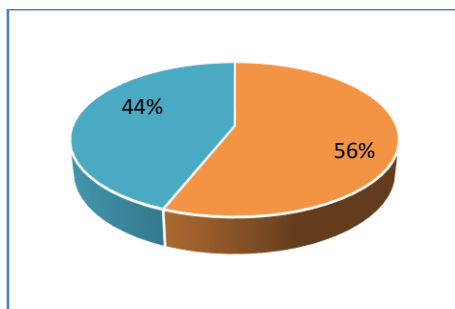


Diagram 8 Percentage Based on the research object

Diagram 8 shows that 56% of research students have used the right object. However, 44% of the 30 theses that were reviewed were still considered inappropriate but used the appropriate objects. The tendency of students to take the industrial world (DUDI) as an object of research shows that students do not fully understand the object of research and what criteria are suitable objects of engineering research because there are still many other research targets that can be used as research objects. Observing these results the role of the supervisor is very large to be able to direct students in determining the object of research.

### Data collection technique

Data collection techniques in this study refer to indicators: (1) using the right data collection techniques but are not supported by complete methods and explanations; (2) using appropriate data collection techniques with complete explanations; (3) the data collection techniques performed do not meet the proper data collection rules. The results of the percentage of a thesis based on the relevance of the sub-chapters can be seen in diagram 9.

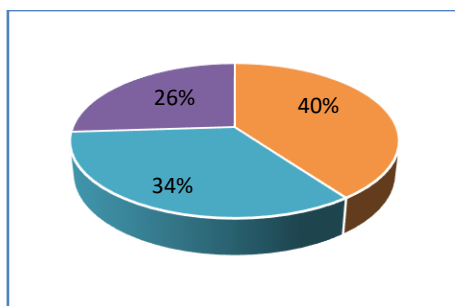


Diagram 9 Percentage of Thesis Based on Data Collection Techniques

Diagram 9 shows that 40% of the 30 theses examined were using the right data collection techniques but were not supported by complete methods and explanations. Meanwhile, the data shows that 34% of the 30 theses examined were using the right data collection techniques with a complete explanation. The remaining 26% of the 30 theses showed that the data collection techniques carried out did not meet the proper data collection rules.

### Instrument Used

The instruments used in this study refer to indicators: (1) using the right instruments, referring to the right concepts, but not sharp enough in arranging instrument items; (2) using instruments but not referring to the right concept; (3) using the right instruments, referring to the right concepts with complete and focused question items, and very complete. The results of the percentage of a thesis based on the relevance of the sub-chapters can be seen in diagram 10.

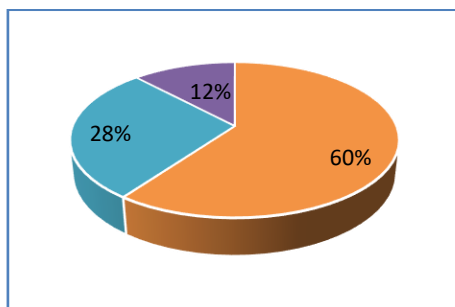


Diagram 10 Thesis Percentage Based on the instrument used

Diagram 10 shows that 60% of the 30 theses that were reviewed using the right instruments, refer to the right concepts, but were not sharp enough in arranging instrument items. Meanwhile, the data showed 28% of the 30 theses used instruments but did not refer to the right concepts. Whereas 12% of 30 use the right instruments, referring to the right concepts with complete and focused question items. and very complete.

### Data analysis

Analysis of the data in this study refers to the indicators: (1) using the design of data analysis techniques but has not been supported by a true and sharp analysis; (2) using a data analysis design but it is not appropriate with the problem being studied; (3) using the right data analysis technique design and supported by correct analysis. The results of the percentage of a thesis based on the relevance of the sub-chapters can be seen in diagram 10.

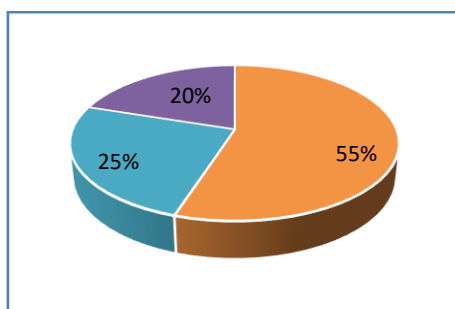


Diagram 11 Thesis Percentage Based on data analysis

Diagram 11 shows that 55% of the 30 theses that were reviewed used data analysis engineering designs but were not yet supported by a true and sharp analysis, while the data also showed that 25% of the 30 theses used a data analysis design but were not in accordance with the problem being studied. And 20% of the 30 theses that were reviewed were using the right data analysis technique design and supported by the correct analysis. Observing this condition, it can be concluded that the actual ability of students in conducting data analysis is quite good, however, training and guidance are still needed. Because with the analysis of the correct data the characteristics of the properties of the data can be easily understood and useful for answering

problems related to research activities, both related to the description of the data and to draw conclusions about population characteristics based on data obtained from the sample (statistics).

## CONCLUSION

Conclusions regarding the quality of educational research conducted by engineering students, especially in the field of education, show that the topic studied has not yet shown the present and innovation. The topic chosen is still limited to the topics discussed in the previous thesis. The topic of media and learning outcomes dominates as a topic of great interest. When viewed from the object of research, the industrial world is the most chosen object by students of the Faculty of Engineering at the University of Ibnu Sina in research conducted to prepare a thesis.

The ability to prepare a research thesis for students needs to be improved, especially in methodology, topic selection, language, data collection techniques, preparation of instruments, data analysis, and drawing conclusions. For this reason, it is necessary to review the factors that cause the weakness of the overall technical research methodology. The study of these factors will be further developed in subsequent studies.

## REFERENCES

- [1] Angker, Feby. 2002. Evaluasi Kerjasama Pembimbing dan Mahasiswa Jurusan Manajemen Dalam Bimbingan Skripsi Angkatan 2000 – 2001 Universitas Kristen Petra”. (abdulhamid.files. wordpress.com/.../materi\_ kuliah\_3\_19\_feb\_06.doc) Asmani, Jamal Ma'mur. 2011. Metodologi Praktis Penelitian Pendidikan. Yogyakarta: DIVA Press.
- [2] Budi, M. 2010. Trend Penelitian Pendidikan Matematika di IAIN Syekh Nurjati Cirebon. Cirebon: IAIN Syekh Nurjati.
- [3] Creswell. 2009. Research Design Third Edition. USA: Sage.
- [4] Duit R. 2007. Science Education Research Internationally: Conception Research Methods. Domain of Research, Eurasia Journal of Mathematics, Science & Technology Education, 3 (1).
- [5] Hermansyah. (2019). ANALISIS FAKTOR-FAKTOR YANG MEMPENGARUHI MAHASISWA MEMILIH FAKULTAS TEKNIK IBNU SINA SEBAGAI TEMPAT KULIAH. Jurnal Teknik Ibnu Sina (JT-IBSI). 4. 10.36352/jt-ibsi.v4i2.240.
- [6] hermansyah. (2019). “EMPLOYABILITY SKILLS VOCATIONAL HIGH SCHOOL STUDENTS IN THE ERA OF ASEAN ECONOMIC COMMUNITY.” INA-Rxiv. October 20. doi:10.31227/osf.io/v4x5n
- [7] Jenkin, E.W. (2001). Research in Science Education in Europe; Restrospect and Prospect. In H. Behrendt, W. Graiber, M. Komorek, A.Kross & P Reiska Eds., Research in Science Education- Past, Present and future. Dordrecht: Kluwer Academic Publishers.
- [8] Sanjaya, Wina. 2013. Penelitian Pendidikan, Jenis, Metode dan Prosedur. Bandung: Kencana Prenada Media Group.
- [9] Pujiyanto dan Suyoso (2011). Analisis kecenderungan dan tren penelitian pada mahasiswa pendidikan fisika sebagai revitalisasi bidang keahlian, penunjang akreditasi: studi kasus prodi pendidikan fisika FMIPA UNY. Seminar Nasional Sains 2011 di program studi pendidikan biologi UNS. Surakarta: UNS.
- [10] Sri. 2012. Penelitian pendidikan kimia: tren global. Seminar Nasional Kimia. Semarang.Unesa.



- [11] Sudiarta, IGP. (2007). Mencermati paradigma baru dalam penelitian pendidikan matematika. Jurnal Pendidikan dan Pengajaran UNDHIKSA No.4 Tahun XXX, Oktober.
- [12] Sugiyono. (2013). Cara Mudah Menyusun Skripsi, Tesis, dan Disertasi. Yogyakarta:Alfabeta Bandung