



Strategies to Improve the Implementation of Research and Community Service at the Faculty of Engineering UNNES Through SWOT Analysis

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ABSTRACT

This research aims to improve the quality and quantity of research and service implementation at the Faculty of Engineering, Universitas Negeri Semarang (UNNES). The strategy of increasing research and service is carried out through the preparation of SWOT analysis. It is hoped that student and community participation can be increased and sustainable in accordance with the vision and mission of the Faculty of Engineering and the service research roadmap. The preparation of SWOT analysis is carried out using the Focus Group Discussion method, with speakers and discussants coming from peer groups. The results of this study include a SWOT analysis and improvement plans resulting from such analysis. Improvement plans that have been prepared include: developing networks and cooperation with various parties at home and abroad related to research and community service; improving the quality of service services in the form of education and training, consultation, workshops, mentoring, and research in the scientific field; initiating the growth of innovation among students and the community; conduct research related to the development of innovations and businesses that have been owned by students and the community; publish research results on entrepreneurship development through national and international journals and conferences; Create textbooks on research and service according to the competencies and courses taught.

Keywords: *research, service, SWOT, faculty of engineering, strategy.*

1. INTRODUCTION

University is one of the spearheads of the country in improving the competitiveness and welfare of the nation. Research is one of the three obligations owned by universities listed in Article 20 of Law Number 20 of 2003 concerning National Education, where universities are required to organize the tri dharma of higher education which includes education, research, and community service [1]. The implementation of research in universities is directed to achieve the goals and standards of National University that ensure the development of specific superior research, increase research capacity, achieve, and improve the quality according to the target and relevance of research results for the people of Indonesia, increase dissemination of research results and protection of intellectual property nationally and internationally, and increase international recognition [2].

Research management is expected to meet eight standards with the scope and explanation of National Standards [3]. The first standard is the standard of research results, the second standard is the standard of research content, the third standard is the standard of the research process, the fourth standard is the standard of research assessment, the fifth standard is the standard of researchers, the sixth standard is the standard of research facilities and infrastructure, the seventh standard is the standard of research management, the eighth standard is the standard of funding and financing research [4].

Faculty of Engineering Universitas Negeri Semarang Encourage and facilitate lecturers in carrying out research activities to support the improvement of the quality of higher education, national competitiveness, and people's welfare in a programmatic and sustainable manner. In addition to developing various research programs directly to universities, it also continues to build

cooperation with various partner institutions, both at national and international levels [5]. Institutions also utilize existing expertise, facilities and infrastructure to develop excellent research programs that are in line with local, national and international development needs. Research excellence in Universitas Negeri Semarang based on Research Cluster can be mapped namely Science, Technology, Education, Social, and Humanities which must all characterize conservation, in accordance with the Vision of the Faculty of Engineering and Universitas Negeri Semarang [6].

Currently Universitas Negeri Semarang is on its way to the World University Index. One of the assessments is in the form of improving the quality of research and service, so that management improvements are needed in research and community service carried out by peer groups. One of the first steps in this improvement is the preparation of a SWOT analysis related to research and community service [7]. A SWOT analysis is a part of planning that aims to identify strengths, weaknesses, opportunities, and threats. The goal is to develop strengths and improve weaknesses, a goal can be achieved. The results of this analysis are expected to be used as guidelines to improve research performance and community service. From this background, the purpose of this study is to develop a strategy to improve research and service at the Faculty of

Engineering, Universitas Negeri Semarang through SWOT analysis.

2. METHODOLOGY

Research on the preparation of SWOT analysis of research and community service was carried out using the Focus Group Discussion method, involving resource persons from peer groups. The data is analyzed descriptively. The steps in compiling a SWOT analysis include:

- a. Classify data, by identifying factors that are strengths and weaknesses as internal factors, and opportunities and threats as external factors [8].
- b. Compare external factors with internal factors to get the whole picture[9].
- c. Interpret and develop the results of the analysis from step (b) into a strategy that is possible to implement [10].
- d. Develop improvement and improvement plans based on the results of SWOT analysis to improve world university ranking [11].

The stages of research are shown in Figure 1.

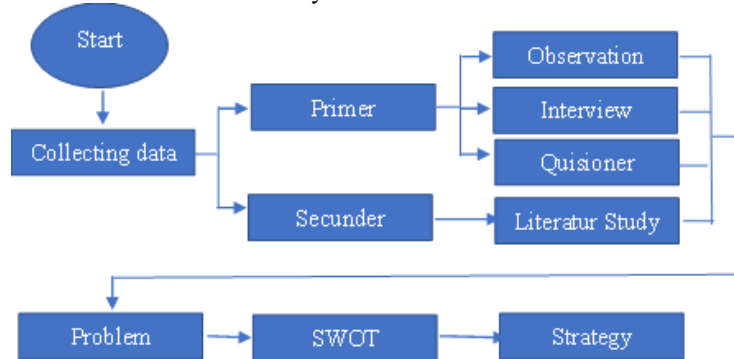


Figure 1. Stages of Research

3. RESULTS AND DISCUSSION

Internal Factors, External Factors and SWOT Analysis Matrix

Table 1. SWOT Internal Factors

No	Strength	Weaknesses
1	Qualified and experienced human resources	Not all human resources produce quality research and service
2	Have an information system (SIPP)	Human resources still cannot maximize the availability of information (lazy to read)
3	Cooperation in the field of service research has been carried out with many other institutions	There is still a lack of international cooperation with world-ranked universities

Table 2. SWOT External Factors

No	Opportunities	Threat
1	The need for innovative research and service that can be applied in the community	Competition with other institutions
2	Funding from the Faculty of Engineering	Policy changes related to research and service
3	Development potential through training, workshops and so on	Losing cooperation partners if there is no effort to maintain networking

Table 3. SWOT Analysis Matrix

	Strengths (S) <ul style="list-style-type: none"> ➤ Qualified and experienced human resources ➤ Have an information system (SIPP) ➤ Cooperation in the field of service research has been carried out with many other institutions 	Weaknesses (W) <ul style="list-style-type: none"> ➤ Not all human resources produce quality research and service ➤ Human resources still cannot maximize the availability of information (lazy to read) ➤ There is still a lack of international cooperation with world-ranked universities
OPPORTUNITIES (O) <ul style="list-style-type: none"> ➤ The need for innovative research and service that can be applied in the community ➤ Funding from the Faculty of Engineering ➤ Development potential through training, workshops and so on 	STRATEGY (SO) <ul style="list-style-type: none"> ➤ To increase capacity in conducting research and service, it is important to develop collaborations with other research institutions and universities. This kind of cooperation can provide support and quality human resources. ➤ Utilizing the information system to publish journals is a strategic step that can increase the visibility of universities. ➤ Optimizing the use of grants and research assistance from government and private institutions 	STRATEGY (WO) <ul style="list-style-type: none"> ➤ Improving the quality of human resources in their fields of expertise through training and consulting programs is an important step to overcome shortages in both quantity and quality. ➤ Upgrading the SIPP information system ➤ Optimization of mentoring program
THREAT (T) <ul style="list-style-type: none"> ➤ Competition with other institutions ➤ Policy changes related to research and service ➤ Losing cooperation partners if there is no effort to maintain networking 	STRATEGY (ST) <ul style="list-style-type: none"> ➤ Improve the quality of human resources ➤ Maintaining networking cooperation with research institutions and industry ➤ Minimize risk 	STRATEGY (WT) <ul style="list-style-type: none"> ➤ Upgrade resources so that there is no risk of losing networking ➤ Optimize the potential of grants and assistance for research and service funds ➤ Strengthen competitiveness

3.1. Strength-Opportunity (SO) Strategy

Develop cooperation with other research institutions and universities to obtain support and qualified human resources in the implementation of research and community service. Utilize existing information systems to publish journals and increase the visibility of the university [12]. Thus, it can optimize the use of grants and research assistance from government and private institutions to expand the reach of research and community service. Through collaboration, the Faculty of Engineering can gain access to knowledge, expertise and infrastructure that may not be available within its own organization. Collaboration also enables the exchange of ideas and experiences between various parties, which in turn can improve the quality and relevance of the research and community service conducted [13]. Thus, developing collaborations with other research institutions and universities is a strategic step to strengthen the Faculty of Engineering's ability to achieve the goal of quality research and service. By using existing information systems, the Faculty of Engineering can facilitate the process of publishing journals online, so that they can reach a wider audience. In addition, by publishing journals through an integrated information system, Faculty can increase accessibility and ease for readers to search and access published research results [14]. In addition to publishing journals, Faculty can also utilize information systems to increase the overall visibility of the university. This can be done by developing an information portal that displays Faculty profiles and activities, as well as relevant research and community service results. Thus, the potential and contribution of Faculty in the academic world and society can be better recognized and accessed by the public at large, thus improving the image and reputation of the college [15]. Stages of steps to improve the quality of research and service at the Faculty of Engineering:

1. Competitive proposal development

Develop quality research and community service proposals that are in line with the priorities and policies of government and private institutions that provide grants. Competitive proposals can increase the chances of getting funding support.

2. Collaboration and partnership

Build collaborations and partnerships with government and private institutions and other partners to submit joint proposals and expand available funding sources.

3. Diversification of sources of funds

In addition to relying on grants from government and private institutions, the Faculty of Engineering can also look for other sources of funding such as funds from international donor agencies, independent funds from universities, or funds from international cooperation programs.

4. Efficient fund management

Manage grants and research grants efficiently and transparently to ensure that they are used optimally in accordance with their intended purpose.

5. Evaluation and monitoring

Conduct regular monitoring and evaluation of the use of grants and research assistance, as well as evaluate the impact and effectiveness of research and community service conducted.

3.2. Weakness-Opportunity (WO) Strategy

Improve the quality of human resources in the field of research and service through training and consulting programs to overcome the shortage of the number and quality of human resources. In addition, strengthening data security and developing a separate SIPP system to store and access related data. Also, optimizing the potential to develop training and consulting programs in the framework of community service. Here are some steps that can take [16]:

1. Identify needs

2. Preparation of mentoring programs

3. Development of mentoring materials

4. Evaluation and feedback

3.3. Strength-Threats (ST) Strategy

Improve the quality of human resources at the Faculty of Engineering to maintain and improve competitiveness with research institutions and community service. In addition, maintaining connections and cooperation with research institutions or industry through efforts to establish good and mutually beneficial relationships. Also, improve data security to address the risk of data loss that can be detrimental to universities [17].

3.4. Weakness-Threats (WT) Strategy

Improve the quality of human resources and data security to overcome the risk of losing connection and cooperation with research institutions or industry. In addition, optimizing the potential of grants and research assistance from government and private institutions to strengthen the quality and number of human resources in the field of expertise. This effort aims to improve the quality and quantity of human resources in the field of expertise, to strengthen competition with research and community service institutions [18]. To improve research and community service at the Faculty of Engineering, it is necessary to take several strategic steps:

1. Developing Networks and Cooperation

Building collaboration with various parties, both domestically and abroad, related to entrepreneurial

development through research and community service.

2. Improving the Quality-of-Service Service

Improve and improve service services such as education and training, consulting, apprenticeship, mentoring, and research in the field of entrepreneurship.

3. Initiating the Growth of International Cooperation Research

Encouraging the growth of research and community service through various cooperation initiatives at the international level with foreign universities.

4. Conducting Development Research

Conducting research related to the development of research and community service that has been owned by students and the community.

5. Publication of Research Results

Publish research results through national and international journals and through websites.

6. Create a Textbook

Compiling textbooks that support the learning process sourced from the results of research, research, and service.

4. CONCLUSION

Research in the field of entrepreneurship still requires a lot of further research. One of the main focuses of Faculty of Engineering is research on entrepreneurial culture in primary, secondary, and higher education. In addition to continuing research in the field of entrepreneurship, it is also important to publish research results in scientific journals and proceedings. Publications not only increase personal indexes but also contribute to the overall advancement of science. Publication is one way and means to convey information that then contributes positively to the development of science.

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