Analysis of Expertise Groups in Compilation of Research Roadmap for Diploma Program in Engineering Technology Building Construction

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ABSTRACT
Regulation of the Minister of Research, Technology and Higher Education number 44 of 2015 concerning the National Standards for Higher Education, universities must make adjustments to meet the standards of education, research and community service. The purpose of this research is to produce a research roadmap that serves as a guide in the implementation and development of research by optimizing the existing infrastructure, the potential of lecturers and students, lecturer and student resources, and existing facilities at Unesa. The research was carried out in several stages, namely paying attention to the leading areas of research focus, research themes, and Unesa priority research topics, considering the Vision of the D4 TRKBG Study Program, analyzing the expertise groups in the D4 TRKBG Study Program. Data collection method with qualitative data analysis. The results of the research theme of the D4 Study Program in Building Construction Engineering Technology, Vocational Program, State University of Surabaya, based on the analysis of the expertise group, are the exploration of applied technology, design, and construction management for the development of eco and disaster-resistant smart buildings.

Keywords: *Road Map, Smart Building, Eco Building.*

1. INTRODUCTION

Regulation of the Minister of Research, Technology and Higher Education number 44 of 2015 concerning the National Standards for Higher Education, universities must make adjustments to meet the standards of education, research and community service [1]. Tridharma of higher education is one of the research activities, so for the smooth implementation of research it is necessary to plan a research roadmap [2]. The purpose of this research is to produce a research roadmap that serves as a guide in the implementation and development of research by optimizing the existing infrastructure, the potential of lecturers and students, lecturer and student resources, and existing facilities at Unesa. The research was carried out in several stages, namely paying attention to the leading areas of research focus, research themes, and priority research topics of Unesa, considering the Vision of the D4 TRKBG Study Program, analyzing the expertise groups in the D4 TRKBG Study Program, planning targets to be achieved in the next 5 years even up to 20 years. in the future, plan the strategies carried out so that the planned targets can be achieved, and produce a D4 TRKBG research roadmap. The resulting output is the division of the D4 TRKBG Study Program Expertise Group and the 2021-2026 D4 TRKBG Research Roadmap.

2. METHODS

The study was conducted based on qualitative meta-data analysis [3] [4]. Data collection is based on the leading areas of research focus, research themes, and Unesa's priority research topics, namely Sports and Health Sciences, Disabilities, Arts and Culture, Science and Technology, Social Humanities and Education in the Unesa Strategic Plan. This research also considers the vision of the D4 Engineering Study Program in Building Construction Engineering, which is to produce professional applied scholars who are superior, best, and trusted at the national level in the field of building construction. The next step is to analyze the expertise

groups in the D4 Engineering Building Construction Engineering Study Program.

Data were also obtained by conducting interviews with lecturers in the D4 Engineering Building Construction Engineering Study Program [5] [6] [7]. In addition, observations were also carried out on current issues and technological developments [8].

3. RESULTS AND DISCUSSION

3.1. Expertise Group

The expertise group structure is based on the education, research and courses taught. In the field of education based on the review of the study program or major taken in the master's program and the thesis topic produced. Research that has been conducted and published both nationally and internationally in the form of journals and proceedings is the main source for determining the expertise group in terms of research. The latest review is based on the courses taught continuously for several years, which shows that the lecturer is focused and making scientific developments, both from the renewable Indonesian National Standard and other rules that apply to the courses being taught. Based on these sources, the expertise group is divided into six groups.

3.1.1. Structural Expertise Group

There are two lecturers who are included in the structural expertise group. The education at the master's level taken by the two people is Civil Engineering with a Concentration on Structures from Gadjah Mada University and Sepuluh Nopember Institute of Technology. The research that has been carried out has focused on Concrete Structures in terms of compressive strength in concrete and trials of environmentally friendly materials in concrete mixtures. The resulting thesis also conducts research on structures based on compressive strength and mix design of concrete mix materials. The subjects taught continuously are materials and concrete technology, concrete structures and steel structures. Based on these sources, it is concluded that it is included in the structural expertise group.

3.1.2. Construction Management Expertise Group

There are two lecturers who are included in the construction management expertise group. The education at the master's level taken by the two people is Civil Engineering with a Concentration in Construction Management and both are from the same university, the Sepuluh Nopember Institute of Technology. The research that has been done focuses on planning the budget and schedule for building work. The resulting thesis also conducts research on budget and schedule planning for building works and quality management for building works. The courses taught continuously are construction management, project management, and construction cost estimation. Based on these sources, it is concluded that it is included in the construction management expertise group.

3.1.3. Geotechnical Expertise Group

There is one lecturer who is included in the geotechnical expertise group. Education at the S2 level taken is Civil Engineering with a geotechnical concentration and comes from the Sepuluh Nopember Institute of Technology. The research that has been done focuses on the pressure and movement that occurs in the soil. The resulting thesis also conducts research on the study of the impact of driving with a review of pressure and movement on the soil. The subjects taught continuously are soil physical properties, soil mechanics, and foundation design. Based on these sources, it is concluded that it belongs to the group of geotechnical expertise.

3.1.4. Soil Surveyor Expertise Group

There is one lecturer who is included in the geotechnical expertise group. Education at the S2 level taken is Civil Engineering with a concentration in remote sensing and comes from the Sepuluh Nopember Institute of Technology. The research that has been carried out has focused on land surveying and mapping technology in the planning of building structures. The resulting thesis also conducts research on surveys and mapping of soil conditions in the planning of building structures. The subjects that are taught continuously are situation mapping and plane measurement. Based on these sources, it is concluded that it belongs to the group of expertise in soil surveying.

3.1.5. Architectural Expertise Group

There is one lecturer who is included in the architectural expertise group. Education at the S2 level taken is Civil Engineering with architectural concentration from the Sepuluh Nopember Institute of Technology. The research that has been carried out has focused on the design of buildings that are green materials and environmentally friendly. The resulting thesis also conducts research on building design that is green material by paying attention to room temperature and room comfort in the building. The subject that is taught continuously is drawing two-dimensional and three-dimensional buildings. Based on these sources, it is concluded that it is included in the architectural expertise group.

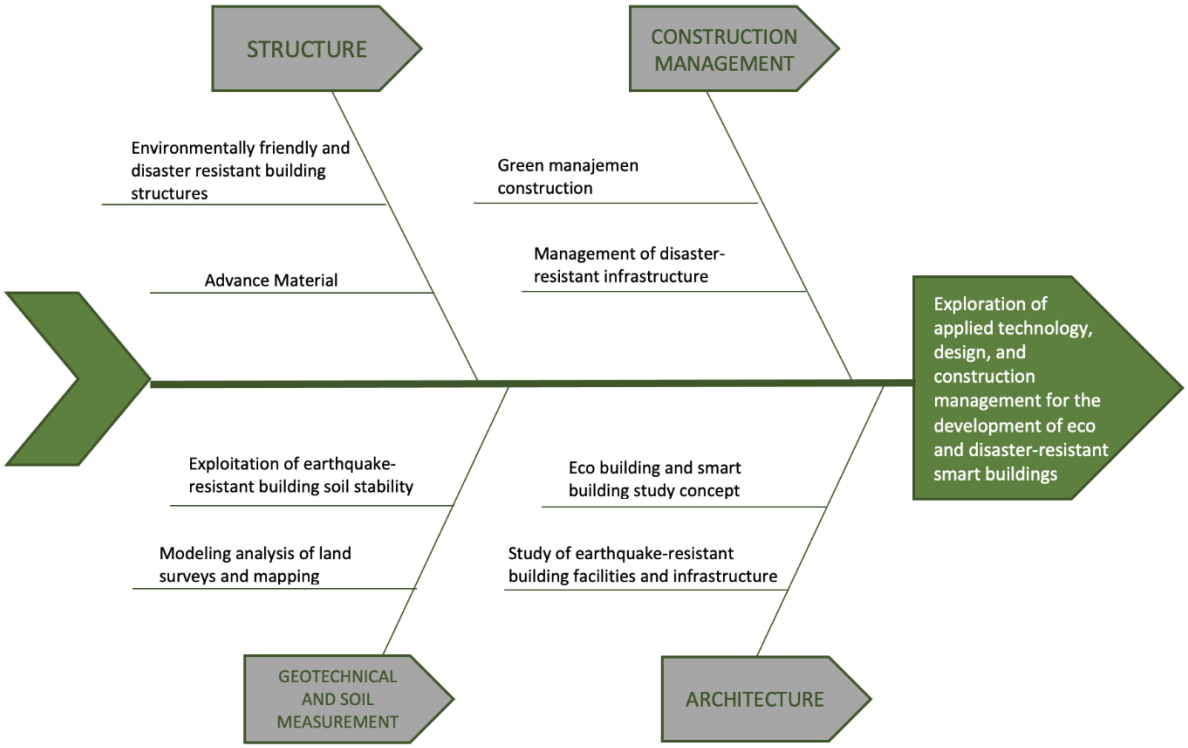

Figure 1 Fishbone analysis.

3.2. Research Topic

Structural expertise groups can carry out research focuses, including:

- Environmentally friendly building structures.
- Disaster-resistant structures.
- Environmentally friendly building materials.
- Development of composites for construction materials.
- Utilization of waste as an advanced building material.

Construction management expertise groups can conduct research focuses, including:

- Disaster-resistant building construction management.
- Cost budget plan on the building structure.
- Analysis of the schedule for the implementation of work on buildings.
- Green management construction.
- Disaster-resistant infrastructure management.

Geotechnical expertise groups can carry out research focuses, including:

- Analysis of modeling of land parcels to anticipate landslide disasters.
- Piling with injection method in anticipation of soil movement.
- Engineering of disaster-resistant building foundations.
- Exploitation of soil stability methods for disaster resistant construction.

Soil surveying expertise groups can carry out research focuses, including:

- Land use planning survey.
- Mapping and surveying the situation on the ground.
- Study of soil stability for disaster-resistant buildings.

Architectural expertise groups can carry out research focuses, including:

- The concept of a smart building design study.
- Concept of eco building and smart building utility facilities/infrastructure.
- Concept of eco building design study.
- Concept of disaster-resistant building facilities/infrastructure.

3.3. Research Theme

D4 Building Construction Engineering Technology as a vocational study program has excellent research that is able to support the transformation from a natural resource-based economy to an innovation-based economy. Efforts made by D4 Building Construction Engineering Technology are to develop a network of research institutional elements in order to form a value chain so as to be able to create renewal and use of creations that refer to the level of need (market-driven), the level of user dependence, economic value and science and technology capabilities.

The flagship research of D4 Building Construction Engineering Technology is "Exploration of applied technology, design, and construction management for the development of eco and disaster-resistant smart buildings". This featured theme refers to the 2017-2045 RIRN, the 2016-2020 Unesa Strategic Plan, the 2015-2019 LPPM Strategic Plan, as well as the vision and mission of the D4 Engineering Technology Study Program Building Construction. This research and service road map is expected to provide direction for research and community service, whether carried out individually/independently or between study programs involving inter-disciplinary disciplines so that research and community service synergies continue to be established on an ongoing basis from time to time and provide clear direction on community service activities based on the results of research conducted.

The research and community service road map of SV-UGM was developed to increase research activities that have superior value as the basis for the formation and implementation of research, and also to develop science based on the prospective of each science family in developing science and technology. The contribution of D4 Building Construction Engineering Technology to national and Unesa is grouped into 2 main focuses, namely advanced materials and disasters.

The research road map of D4 Engineering Technology Building Construction of the Vocational Program of the State University of Surabaya can be seen in the image of the fishbone analysis approach.

4. CONCLUSION

The research theme of the D4 Study Program in Building Construction Engineering Technology Vocational Program, State University of Surabaya based on the analysis of the expertise group is the exploration of applied technology, design, and construction management for the development of eco and disaster-resistant smart buildings.

REFERENCES

[1] Regulation of the Minister of Research, Technology and Higher Education (Permenristekdikti) number 44 of 2015 concerning the National Standards for Higher Education, then universities must make adjustments to meet the standards of education, research and community service.

[2] Business Strategy Plan Universitas Negeri Surabaya, 2020.

[3] Gall, Meredith. D, Joyce P. Gall & Walter R. Borg. 2003. Educational Research An Introduction Seventh Edition. USA: Pearson Education, Inc.

[4] Taylor, SJ dan R Bogdan. 1984. Introduction to Qualitative Research Methods: The Search for Meanings, Second Edition. John Wiley and Sons. Toronto.

[5] Yunus, Hadi Sabari. 2010. Contemporary Area Research Methodology. Yogyakarta: Pustaka Pelajar.

[6] Singarimbun, Masri dan Sofian Effendi (ed.). 1989. Survey Research Methods. Jakarta: LP3S

[7] Holloway, I & Wheeler, S. (1996). Qualitative re-search for nurses. London: Blackwell Science.

[8] Bungin, M. Burhan. 2007. Qualitative Research: Communication, Economics, Public Policy, and Other Social Sciences. Jakarta: Kencana Prenada Media Group.