
National Standard Research in Universities

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Keywords

Scope, objectives, quality, and research-based learning.

Abstract

National Research Standards are the minimum criteria regarding the research system in universities that apply in all jurisdictions of the Unitary State of the Republic of Indonesia (NKRI) National Standards. This research also has several scopes and objectives that can be achieved by universities. In addition, a quality assurance system for higher education is needed, research-based learning and how to build a research culture in universities.

INTRODUCTION

Higher education is not only a place for people to gain knowledge. Higher education institutions (PT) are also educational institutions that play a very important role in developing quality human resources to meet development needs but also become one of the contributors in developing science and technology in the country and also in the world. In accordance with applicable regulations, universities are expected to be able to support the implementation of research. It is also aimed at developing and advancing science and technology in Indonesia.

To support the achievement of these goals, there are a number of National Research Standards that must be understood by every university. This standard is a system that refers to the implementation of research activities in all universities in Indonesia. National standards do not only apply to campuses in certain areas. But nationally, so long as the campus is standing in the jurisdiction of the Republic of Indonesia. So this standard becomes a reference that must be obeyed and fulfilled. It is hoped that with the existence of national standards like this, universities are not original in conducting research but must comply with national research standards that have been regulated.

The government has announced the establishment of quality assurance for all universities through the Higher Education Quality Assurance System (SPM Dikti). To fulfill all this, a quality assurance system that applies to universities is needed. This quality assurance aims to maintain and improve the quality of higher education in a sustainable manner, which is carried out internally to realize the vision and mission of universities and to meet the needs of stakeholders through the organizers of the Tridharma of Higher Education. This can be carried out internally by the PT concerned, controlled and audited through accreditation activities carried out by the National Accreditation Board (BAN) for Higher Education or other institutions externally. So that the objectivity of the assessment of the maintenance and improvement of academic quality on an ongoing basis in a university can be realized.

Research in the world of education also requires activities to obtain data that proves the truth or untruth of an assumption or hypothesis according to scientific rules and methods that are carried out systematically for the advancement of science and technology. In the scope of tertiary institutions, research activities aim to develop theory and science. Research must have a standard of research content with the depth and breadth of research material that includes the principles of usefulness, up-to-date, and able to answer the needs of the community. A research institute is an institution that accommodates the field of research. Study programs must have research standards by looking at academic qualifications and researchers' mastery of research methodologies as well as providing research facilities and infrastructure standards that must meet researchers' comfort, health, and safety standards.

Moreover, now it is easier for us to access reputable research references, both domestically and internationally, (Rahmatullah, AS, et al., 2020) and it is sufficient to access them through cellphones, (Syahrani, S. 2021) so universities should be able to manage and set research standards according to national standards, (Syahrani, S. 2022) so that the research of lecturers and students is expected to be more focused (Syahrani, S. 2022) and more meaningful, (Shaleha, Radhia, and Auladina Salihah, 2021) research development is more managed because he knows where he is going, (Syahrani, S. 2018) especially in the Koran there are many verses that talk about the importance of quality control management, (Syahrani, S. (2019) and actions like this are strategies that are responsive to current conditions happening in the world. education, (Chollisni, A., et al, 2020) the transfer of knowledge can go hand in hand with character building and the research is also of high quality as evidence of academic excellence. academics are able to compete according to the times, (Syahrani et al., 2020) it is not only important to do research, but also to be able to produce quality research with horrendous power (Syahrani, 2018) so that the campus has the opportunity to be glimpsed by many people,

(Syahrani, 2017). It is hoped that the course of education in Indonesia will be more ideal, (Syahrani, 2017) even though internet coverage is still not evenly distributed across all campuses (Syahrani, 2017).

METHODS

The method used in this research is using a qualitative method. This method is more focused on in-depth observations based on facts without being made up. So that this research produces results that are in accordance with the existing facts. This method also makes it easier for researchers to dig deeper information about the topic of the problem being studied.

RESULTS AND DISCUSSIONS

The scope of the national standard of this research consists of the following:

Research Result Standard

The first standard in research is related to research results. Is a minimum criterion about the quality of research results. The results of this study are all the outputs obtained during research activities that follow established procedures and standards. It is hoped that the results of the research will be able to support the development of science and technology as well as improve the welfare of the community and the competitiveness of the nation. All research results that do not have a negative or harmful impact must be published. There are various ways to publish it, it can be through seminars, publications, patents, and so on. In essence, all ways that can help disseminate research results so that they are easily accessible to the wider community can be used as options.

Research Content Standards

The second research standard is related to research content, which includes basic research and applied research. As for the content of the research is the criteria that must be met by the content of the research itself. The main focus is the breadth and depth of the research content. In basic research, the research content is expected to meet the criteria as a result of external research that focuses on explanations or findings that can anticipate a new symptom or phenomenon or postulate. While in applied research, the research content is expected to focus on innovation or the development of science and technology. The results of this external research are then applicable or easy to apply so that they can work as expected.

Research Process Standard

The third National Research Standard covers aspects of the research process, so that all processes or stages in research must comply with established standards. The

standards are: Research activities consist of planning, implementation, and reporting, Complying with scientific rules and methods systematically in accordance with scientific autonomy and academic culture and taking into account quality standards, work safety, health, comfort, and security for researchers, the community, and the environment.

Research Assessment Standards

The fourth research standard is the research assessment standard. A research activity will have to be assessed based on its quality, whether the procedure is in accordance with the rules or not, and whether the results have met the criteria or not, and so on. Research in higher education is expected to meet assessment standards which include the following: Assessment is carried out in an integrated manner by meeting educational, objective, accountable, and transparent aspects, Must pay attention to content standards, result standards, and research process standards and use relevant, accountable research methods and also represents the achievement of the criteria of the research process and results.

Research Standard

The fifth National Research Standard is about the researcher aspect. So, not all lecturers can do research in a university environment. Unless the lecturer meets national standards which include: Having the ability to carry out research activities, Mastering research methods that are in accordance with the scientific field occupied, the object of research as well as the level of complexity and depth of research determined based on academic qualifications and Determining the authority to carry out research activities in accordance with guidelines determined by the Deputy for Strengthening Research and Development.

Research Facilities and Infrastructure Standards

The sixth research standard is about all facilities and infrastructure for research activities. The facilities and infrastructure referred to are all facilities owned and provided by universities to support research. The facilities and infrastructure used are: Meet quality standards, Meet work safety standards, Meet safety standards, Meet comfort standards, Meet health standards, and also Meet safety standards for researchers, the community, and the surrounding environment.

Research Management Standards

The seventh research standard is regarding the aspect of research management, in which each university is expected to have a team that manages research activities. The management is expected to be the same as or close to the research governance of various

research institutions in Indonesia. The tasks of the team or work unit that are part of the management of this research are planning, implementing, controlling, monitoring and evaluating, as well as reporting research activities.

Research Funding and Financing Standards

The last research standard is regarding funding and research funding. To support the implementation of research activities there is a minimum fund that must be provided. This funding source can come from internal university funds, it can also come from the government and institutions and industries that are research partners. The existence of this minimum funding limit standard helps researchers carry out research activities without worrying about stopping in the middle of the road because they run out of funds.

The details of the National Research Standards described above can then be understood to include educative, objective, accountable, and transparent aspects. This national standard setting helps universities as research organizers to provide support in accordance with the provisions. At the same time helping to direct the lecturers and students to conduct research in accordance with the standards that have been set. The impact is not only helping to meet national research objectives. However, it also ensures that the research conducted is free from elements of plagiarism and manipulation.

Objectives of National Research Standards

The objectives of the National Research Standards are as follows: 1) Ensuring that the goals of higher education play a strategic role in educating the nation's life, advancing science and technology by applying humanities values and cultivating and empowering the Indonesian nation in a sustainable manner. 2) Ensuring learning in study programs, research, and community service in order to achieve quality in accordance with the criteria set out in the National Higher Education Standards. 3) Encouraging universities to achieve quality learning, research, and community service beyond the criteria set out in the National Higher Education Standards in a sustainable manner.

College Quality Assurance System

In the current Industrial Revolution Era, changes are required in all aspects, including the management of higher education institutions. The management of this university is an effort by universities to follow standardization which is a reference for all management carried out by universities. All universities must meet the standards that have been set in order to continue to maintain their existence, especially related to the quality of higher education which is the level of conformity between the implementation of higher education and higher education standards. It consists of the National Higher Education Standards and Higher Education Standards set by Universities, while the higher education

quality assurance system is a systemic activity to improve the quality of higher education in a planned and sustainable manner.

The government has announced the establishment of quality assurance for all universities through the Higher Education Quality Assurance System (SPM Dikti). Based on Law no. 12 of 2012 concerning Higher Education, this SPM Dikti includes the Internal Quality Assurance System (SPMI) and the External Quality Assurance System (SPME) or better known as Accreditation. SPM Dikti is an internal and external quality assurance system. The existence of a policy on the quality assurance system of higher education from the Directorate General of Higher Education, Ministry of Education and Culture as a master program for the development of higher education as an effort to improve the quality of higher education. This higher education quality assurance system is an integration of internal and external quality assurance systems after the issuance of Government Regulation (PP) No. 19 of 2005 concerning National Education Standards which among other things states that every education unit in the formal and non-formal channels is obliged to guarantee the quality of education (Bancin, A. 2017).

Then, the Internal Quality Assurance System (SPMI) is an autonomous higher education quality assurance system activity by each tertiary institution to control and improve the implementation of higher education in a planned and sustainable manner, and the External Quality Assurance System (SPME) is an assessment activity through accreditation to determine eligibility. and the level of achievement of the quality of study programs and universities.

The Higher Education Quality Assurance System (SPM PT) is a higher education standard consisting of the Internal Quality Assurance System (SPMI) which has a cycle of Establishing Higher Education Standards, Implementation of Higher Education Standards, Evaluation (implementation) of Higher Education standards, Control (implementation) of Higher Education standards and Improvement (implementation) of the Higher Education standard called PPEPP. Meanwhile, the External Quality Assurance System (SPME) which has a cycle of Data and Information Evaluation, Determination of Accreditation Status and Accredited Rating, Monitoring and Evaluation of Accreditation Status and Accreditation Rating, is called EPP (Fitrah, M. 2018); (Hendriarto et al., 2021).

Research-Based Learning

Understanding Research-Based Learning

Research-based learning is a teaching system that is authentic problem solving with the point of view of problem formulation, problem solving, and communicating the benefits of research results. This is believed to be able to improve the quality of learning. With the hope that students can develop critical thinking skills, analyze and evaluate a problem.

Students should also be able to build new knowledge from research procedures. Research-based learning is a student-centered learning (SCL) method that integrates research into the learning process. Research-based learning is multifaceted which refers to various learning methods (Widayati, D.T., et al. 2010); (Widjaja and Aslan, 2022).

This research-based learning provides opportunities or opportunities for students to seek information, formulate hypotheses, collect data, analyze data, and make conclusions on data that has been arranged in activities that apply to learning with the "learning by doing" approach. This approach using research-based learning can change the focus of education from memorizing concepts and facts to learning based on inquiry, then students try to answer to understand or solve a problem.

Learning objectives are formulated in a simple and clear, but attractive presentation system. Research-based learning is based on the philosophy of constructivism which includes 4 (four) aspects, namely: learning that builds student understanding, learning by developing prior knowledge, learning which is a process of social interaction and meaningful learning achieved through real experience. Research is an important means to improve the quality of learning. The research components consist of: background, procedures, implementation, research results and discussion and publication of research results.

Therefore, research-based learning opens up opportunities for the development of learning methods, including: learning renewal (curriculum enrichment) by integrating research results, active student participation in research implementation, learning using research instruments, and inclusive research context development (students can study procedures and research results to understand the intricacies of synthesis). Several research-based learning models can be developed in accordance with the characteristics of the study of science and the condition of the facilities available in the education unit concerned.

The strategy for implementing research-based learning should really be considered so that the implementation of research-based learning is more effective and the objectives of research-based learning can be achieved. Here are some strategies for integrating learning and research empirically;

1. Enriching teaching materials with the results of lecturers' research

The results of the lecturer's research are used to enrich teaching materials in learning. Lecturers can present the results of their research as real examples in lectures, which are expected to serve to assist students in understanding research ideas, concepts, and theories. In this activity, values, ethics, and research practices that are in accordance with the field of science being taught can be conveyed to inspire students. Students can apply a comprehensive discussion about the research that is being done by the lecturer.

2. Using the latest research findings.

The latest research results obtained from the library or from journals are discussed in lectures. This is intended to support the subject matter in accordance with the discussion during the lecture. The process of growth and development of science and technology is informed and explained in lectures as a series of historical developments of that knowledge. By using steps like this, students can understand that current policies and practices are a continuation and a series that cannot be separated from policies and practices that have been developed in the previous period, so it can be said that this is a unified dynamics of the development of science and technology. .

3. Enriching lecture activities with contemporary research issues.

Lecture activities with contemporary issues can be started by asking students to present current issues and research trends that are in accordance with the subject at that time, then students are expected to conduct discussions about the application of these research issues to solving real problems in life daily.

4. Teaching research methodology material in the lecture process

Lecturers are needed at a glance to introduce and give students an understanding of research methods. The intended research method is a research method that is in accordance with the problems being faced during the lecture.

5. Enriching the lecture process with mini research activities

During lectures, students form study groups and are given the task of doing research collectively. Through a process like this, students can improve and develop their skills and knowledge through these activities. With this activity, the culture of conducting research will be more formed when compared to the research being conducted independently.

6. Enriching the lecture process by involving students in institutional research activities

Research grants for lecturers in each study program should involve students in conducting their research. This is necessary so that students begin to get used to scientific thinking and find solutions to research problems that are being faced by lecturers.

7. Enriching the lecture process by encouraging students to feel part of the research culture in the faculty/study program

In addition to institutional research, it is also necessary to build joint research between students and lecturers at the study program level. The research begins with the basic problems faced at the faculty and study program levels so that solutions can be carried out through joint research between students and lecturers.

8. Enriching the lecture process with values that researchers must possess

The values that must be possessed by researchers should be understood by students. These values include: objectivity, respect for research findings, respect for other views, tolerance for uncertainty, and analytical skills (Rangkuti, A. N. 2017).

The success of research-based learning is highly dependent on strong support from the institution and the entire existing academic community. A number of facilities should ideally be prepared by institutions such as information technology, laboratories, and libraries (Prahmana, R.C.I. 2015). In addition, other supporting factors are needed, such as student study groups, research assistance and dissemination of student research results. Student study groups are formed by students based on their respective interests. This interest is related to the interest in research that will be carried out by students (Waris, A. 2009). Research assistance and dissemination of student research results can be in the form of grants as an effort to encourage student interest in conducting research as soon as possible.

Supporting Theories of Research-Based Learning

The implementation of research-based learning is built based on the synthesis of several learning theories that have been developed previously. The learning theory in question is the theory of behaviorism, the theory of cognitivism, and the theory of constructivism. The learning theories are integrated and complementary so that a model is formed that is in accordance with the characteristics of students in higher education. The three learning theories will be described below.

1. Theory of Behaviorism

Behaviorism theory views learning as a visible change in a person's behavior which is the result of the experience of interacting with his environment. Learning that occurs depends a lot on the environment. This kind of learning is manifested in the form of a relationship between stimulus and response. Skinner as one of the figures in this learning theory mentions that the main element is the provision of reinforcement. According to this theory, the response is a manifestation of a person's behavior change, and will become permanent if it is done with reinforcement. The strength of this behaviorism theory lies in the situation where a person is faced with a clear goal and is able to respond to things that are closely related to that goal.

2. The theory of cognitivism

This learning theory contributes greatly in building research-based learning. This theory emphasizes the active involvement of the mind in every learning activity. Learning activities emphasize one's mental and intellectual activity. One of the figures in this theory of cognitivism is Gagne. He distinguished cognitive into five categories, namely: verbal information, intellectual skills, cognitive strategies, motor skills, and attitudes. Where each category requires learning in its own form. This theory states that

in an effort to master knowledge and skills, a person is required to actively seek by involving cognitive abilities to give meaning through cognitive skills such as analysis, synthesis, or evaluation.

The most important concept in this theory is the existence of a three-stage information processing scheme and model, namely the register stage, the stage of short-term memory, and long-term memory. Schema is a knowledge structure that someone already has that is used to make connections with new knowledge. The first information processing occurs when the register recognizes the received input, then the input is processed in short-term memory, then transferred to long-term memory to be stored and used in the future.

3. Constructivism.

This learning theory is part of the cognitive learning theory. Constructivism views learning as an active process in which students construct knowledge (Hadi, S. 2005). Knowledge in constructivism is a construction (formation) of people who know schemata, where knowledge cannot be transferred from one person to another (Sukiman, 2008). The formation of knowledge is a cognitive process where there is a process of assimilation and accommodation to achieve a balance so that a new schema is formed. This view emphasizes that knowledge comes from a person's formation and not from the surrounding environment. This learning theory has four main characteristics, namely students reconstruct their own understanding, new knowledge is built based on previous knowledge, understanding is obtained through social interactions carried out by individuals, and learning through experience to build meaningful knowledge.

Building a Research Culture in Higher Education

Learning that Supports Research Skills

Learning that has the carrying capacity of research skills for students includes problem based learning, Project based learning, Inquiry based learning, and research based learning. Problem based learning is student-centered learning that empowers students as reviewers, combines theory with practice, and applies knowledge and skills to solve predetermined problems. Problem based learning is implemented that the curriculum content is not arranged based on courses but based on problem scenarios that must be solved by students.

Students learn and work in groups to find information and what skills they need to solve problems effectively. In contrast to problem based learning, project based learning, which is another term for problem based learning, emphasizes the project aspect, where students and their groups are given a set of tasks (projects) that must be solved in scientific ways according to the characteristics of authentic problems. , curriculum based, and often

multidisciplinary. Students are also required to determine the approach to be used, collect information and reconstruct it so that it becomes new knowledge.

At the end of the lecture, students convey the knowledge they have gained so that other groups can provide input as material for reflection. The role of lecturers in project based learning is more limited, for example providing guidance or input on what students are doing. Inquiry based learning has a striking difference with the two learnings above. The main characteristic of Inquiry based learning is seen in the full involvement of students in the learning process, namely in determining learning objectives, learning topics, and learning processes that develop research skills and analytical skills. Learning activities usually begin with a problem or research question that requires critical thinking to reconstruct understanding.

Building a Research Culture in Higher Education

An ideal place to conduct research activities is the campus world. This happens because the campus has very supportive facilities and infrastructure. As an educational institution that is a factory of scientists, it is natural that campuses have an important role in producing academic products that are competitive and beneficial to society, by generating new ideas or ideas. However, this will be done if the policy rules and academic bureaucracy are friendly so that an academic culture in the form of critical thinking, creative, innovative, and initiative can emerge from the entire academic community in the campus environment.

In addition, ideally lecturers are not too constrained by many administrative rules so that the time for lecturers to conduct research is wider and in-depth. The lack of a research culture on campus can be caused by internal factors of the academic community who sometimes assume that the lecturer's job is only to teach. If this continues, the campus identity will be lost as a scientific institution that upholds the tri dharma of higher education. A research culture will be built if the campus is able to facilitate the academic community on an ongoing basis.

CONCLUSION

There are a number of National Research Standards that every university must understand. This standard is a system that refers to the implementation of research activities in all universities in Indonesia. In addition, quality assurance is needed which aims to maintain and improve the quality of higher education in a sustainable manner, which is carried out internally to realize the vision and mission of the university, and to meet the needs of stakeholders through the organizers of the tridharma of higher education.

Next is the culture of doing research that can be used as an indicator of the success of a research-based university. Research-based learning is a learning method that uses

authentic learning, problem solving, cooperative learning, contextual learning, and an inquiry approach that is guided by the philosophy of constructivism. This research-based learning has made a real contribution to the growth of students' skills in conducting research.

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