

CAMPUS INTELLECTUAL PRODUCT BUSINESS DEVELOPMENT PROGRAM

Ade Heri Mulyati^{a*)}, Diana Widiastuti^{a)}, Prasetyorini^{a)}, Siti Warnasih^{a)}, Linda Jati K^{a)},
Yulian Syahputri^{a)}

^{a)} Universitas Pakuan, Bogor, Indonesia

^{*)} Corresponding Author: adeherimulyati@gmail.com

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Abstract

KAN's accredited Laboratory of Service of the Faculty of Mathematics and Natural Sciences is very much needed by all lecturers and students of the University of Pakuan as one of the means to accelerate the study period of students and improve the performance and quality of research for all lecturers in Pakuan University. Faculty of Mathematics and Science Service Laboratory Universitas Pakuan has been officially established based on the University of Pakuan Rector's Decree Number: 15.1 / Kep / Rek / II / 2018 dated 20 February 2018 signed by the Chancellor of Pakuan University namely Dr. H. Bibin Rubini, M.Pd. It was founded as one of the Campus Intellectual Business Units in charge of serving chemical analysis services for all students and lecturers in the Pakuan University environment for food products, natural materials, and the environment as well as providing various skills training that must be possessed by students to obtain work and improve their competence. The target of it is to become a laboratory accredited by the National Accreditation Committee by implementing ISO 17025: 2017 in running the system so that the resulting data output can be accounted for.

Keywords: Service Laboratory, food analysis, environmental analysis, natural material analysis, quality of the publication.



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I. INTRODUCTION

Pakuan University is one of the largest private universities in Bogor which was founded in 1980, located right in the center of Bogor. It has 6 faculties with 32 Study Programs. The development of Pakuan University is increasing rapidly every year, this can be seen based on the number of new student registrants that continues to increase. The increasing number of students continues to be balanced with the number of lecturers. In the 2015/2016 academic year, the DIKTI database shows that the number of active students of Pakuan University is 16,003 students with a total number of permanent lecturers of 354 students.

Every Lecturer has the obligation to implement the Tri Dharma of Higher Education namely education, research and community service. Education is carried out through further study and the implementation of student lectures. Research and community service carried out in the campus and surrounding areas by using independent funds of Pakuan Siliwangi Foundation, as well as government and private funds. Every student is required to conduct research in the preparation of his final assignment as one of the requirements to get a bachelor's degree. All research and community service carried out by students and

lecturers is directed towards the vision of the University of Pakuan namely Superior, Independent, and Characteristic and in line with the Research Plan of Pakuan University.

Since 1993, the Pakuan Siliwangi Foundation has provided assistance to each lecturer team in conducting research and community service. The number of first studies funded each year is increasing. Since 2000 Pakuan University has succeeded in getting research funding grants sourced from DP2M DIKTI. In 2014 the number of research funded by the DIKTI was 17 titles with nominal funds that exceeded 1 billion rupiahs and were dominated by clusters of Mathematics and Natural sciences. The implementation of lecturer and student research really needs the support of facilities and infrastructure that meet the required standards. So far, lecturer and student research have been carried out in educational laboratories owned by each study program with services, tools, materials, and methods that have not been standardized.

The Service Laboratory of the Faculty of Mathematics and Natural Sciences accredited by KAN (National Accreditation Committee) is very much needed by all lecturers and students of Universitas Pakuan as one of the means to accelerate the study

period of students and improve the research quality and performance of all lecturers in Pakuan University.

a. Competitors, Product Excellence, and Consumers

The KAN accredited laboratory competitor in the University of Pakuan does not yet exist, even though the number of lecturers and student researches is increasing every year along with the increase in the number of students and the demands of the performance burden of lecturers in implementing the Tri Dharma of Higher Education. Each Study Program in the University of Pakuan already has a laboratory, but the laboratory only serves students in carrying out lab work or experiments with several practicing subjects or what we commonly refer to as educational laboratories.

The advantages of KAN accredited Laboratory Services are serving product analysis services or raw material analysis services, etc. for students or lecturers in order to carry out their research with accurate and valid data [1]. The analysis is carried out using calibrated tools, standardized materials, validated methods, and competent analyst staff according to the required standards so that the resulting data can be accounted for [2]. It can also improve the quality of scientific work produced by all students and lecturers at the Pakuan University because the data from the research can be traced with certainty good documentation in this Service laboratory. It can be accessed by all students and lecturers in the University of Pakuan with service standards that are in accordance with the applicable SOPs. The analysis services provided are always increased gradually according to the improvement of available infrastructure, tools and materials according to standards in order to support the Pakuan University research strategic plan.

Table 1. Advantages of KAN accredited Service Laboratory

Criteria	Service Laboratory	Educational Laboratory Pendidikan
Analyst	Trained / certified analyst	General laboratory
Glassware	Calibrated	Not calibrated
Instrument	Calibrated	Not calibrated
Chemical material	CRM / SRM / Standard	General
Method	Validated	Trials
Service	Standard	Not standardized
Data Documentation	Searched for	Not tracked

KAN accredited Consumer Laboratory Service University Pakuan can be accessed by all students and lecturers in the University who carry out research in the Mathematics and Natural Science's field as well as all general public, industry, government agencies and others who can utilize the analytical services provided according to the standards of services and services that have been prepared. The standards of services and

services provided must continue to be improved according to the demands of existing consumers [4].

b. Types and Specifications of Pakuan University Service Laboratory Products

The types and specifications of the Pakuan University Service Laboratory products are analysis services for various food products which include proximate analysis services (analysis of water content, ash content, protein content, fat and oil content, crude fiber content, total carbohydrate content), environmental analysis services (analysis of COD, BOD, DO, TDS, pH, DHL, odor, taste, temperature, TSS, Cl-, KMnO₄, MBAS, heavy metals, NO₂, SO₂, NH₃, H₂S, TSP, CO, and noise) and material analysis services nature (alkaloids, flavonoids, terpenoids, and saponins). Analysis services provided must always be developed through the addition of various parameters of analysis according to consumer demands.

c. HKI Laboratory Service, Pakuan University.

Pakuan University Service Laboratory is the first laboratory in the Pakuan University that is ready to serve analytical services for all students and lecturers in the Pakuan University with the potential to get certification from the National Accreditation Committee (KAN) because it has infrastructure that has required standards, has tools, materials, instruments and human resources that are ready to go to a laboratory certified by KAN.

d. Benefits of PPUPIK Service Laboratory at Pakuan University from the Socio-Economic Aspect

The Service Laboratory is in addition to serving analytical services for all students and lecturers in the MIPA research field, as well as providing analytical services for all people who need such analytical services, both the general public, industry, government, and private institutions. The benefits that will be obtained from the Service laboratory are two advantages that are obtained simultaneously, namely the advantages of academic aspects in the form of improving the quality of research and publications from all lecturers and students in the University of Pakuan, as well as the benefits of socio-economic aspects, namely increasing income and welfare for all lecturers and employees Pakuan University because Service laboratories can be one of the academic business units owned by Pakuan University.

II. METHODS

1. Raw materials

The raw material for analysis of the sample consists of chemicals, analytical equipment, and sampling equipment, all of which can be easily

obtained at chemical material and equipment stores located not far from PPUPIK's location.

2. Services provided

Service Laboratory of the Faculty of Mathematics and Natural Sciences Pakuan University provides analytical services for a variety of food products which include proximate analysis services (analysis of water content, ash content, protein content, fat and oil content, crude fiber content, total carbohydrate content), environmental analysis services (analysis of COD, BOD, DO, TDS, pH, DHL, odor, taste, temperature, TSS, Cl-, KMnO4, MBAS, Cu and Zn, NO2, SO2, NH3, H2S, moisture and noise) and Materials analysis services nature (alkaloids, flavonoids, terpenoids, and saponins).

3. Types of clients/customers received

Customers who can use Service University Pakuan's laboratory analysis services are all students and lecturers in the University who carry out research in the Mathematics and Natural Science's field as well as all the general public, industry, government agencies and others who can utilize the analytical services provided according to service and service standards prepared.

4. Service Process Analysis Service Laboratory of Pakuan University

The sample acceptance mechanism in accordance with SNI ISO / IEC 17025 2008 [3], is as follows :

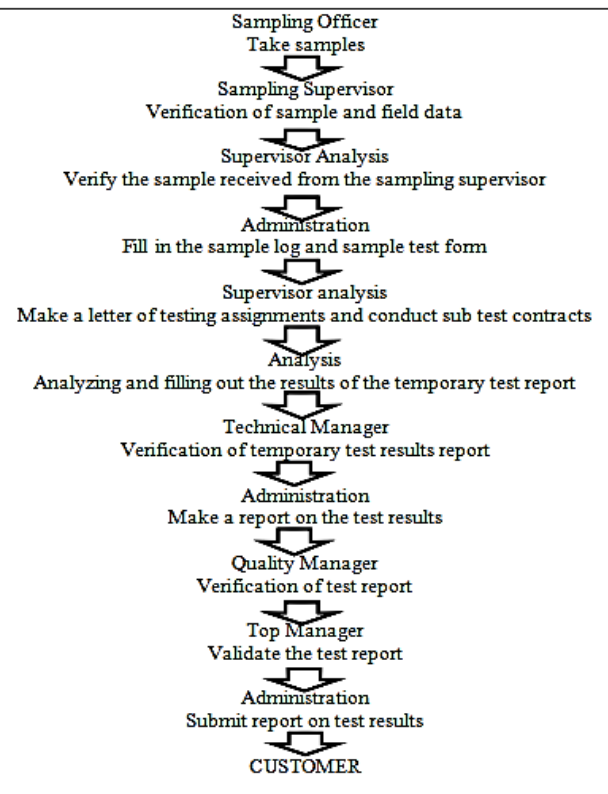


Figure 1. Analysis mechanism for sample service delivery [3]

5. Management of the Pakuan University Service Laboratory

The management structure owned by the Service University Pakuan laboratory refers to SNI ISO / IEC 1725: 2008 as figure 2.

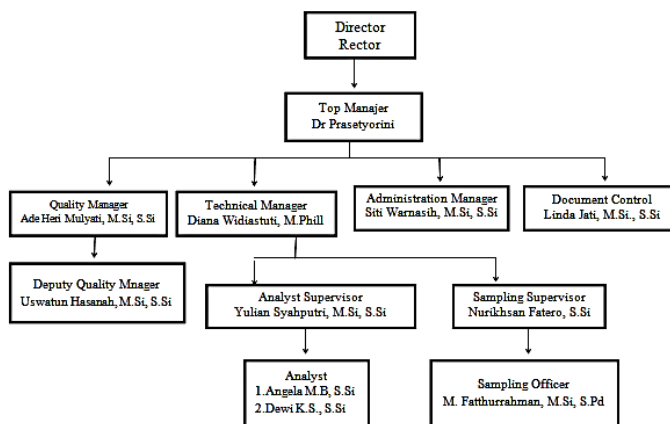


Figure 2. Organizational Structure of Pakuan University Service Laboratory

III. RESULTS AND DISCUSSION

Establishment of Faculty of Mathematics and Natural Science Service Laboratory, Pakuan University

Faculty of Mathematics and Natural Science Service Laboratory Universitas Pakuan has been officially established based on the University of Pakuan Rector's Decree Number: 15.1 / Kep / Rek / II / 2018 dated 20 February 2018 signed by the Chancellor of Pakuan University namely Dr. H. Bibin Rubini, M.Pd. It was established as one of the campus's Intellectual Business Units that serves chemical analysis services for all students and lecturers in the University of Pakuan for food, natural and environmental products and provides various skills training that must be possessed by students as a means to obtain work and improve their competence. The target of it is to become a laboratory accredited by the National Accreditation Committee by implementing ISO 17025: 2017 in running the system so that the resulting data output can be accounted for.

Faculty of Mathematics and Natural Science's Pakuan Service Laboratory was pioneered by the Chemistry laboratory which has provided chemical analysis services provided to lecturers and internal students who are conducting research. Analysis services that have been running to date are for the analysis of food, environment, and natural materials, especially for students and lecturers of the Chemistry and Pharmacy Study Program who have done a lot of research in the Chemical Laboratory of Pakuan

University. The Pakuan University Service Laboratory was established as a form of effort to legalize chemical analysis services that have been taking place informally between laboratories and consumers, in this case, students and lecturers in Pakuan University, which later turned into formal analysis services with service systems and analysis documentation according to ISO 17025: 2017 standards.

The benefits that will be obtained simultaneously from the Service laboratory are namely: the advantages of academic aspects in the form of improving the quality of research and publications from all lecturers and students in the Pakuan university, as well as the socio-economic aspects of increasing the income and welfare of university students and employees. The Service laboratories can be one of the academic business units owned by Pakuan University. The targeted output is food product analysis services, environmental analysis, and natural materials.



Figure 3. Photo of Faculty of Mathematics and Natural Science Labotarorium Service Pakuan University

Training and Preparation of ISO 17025: 2017 Documents

To achieve these targets various efforts have been made including the training process for preparing ISO 17025: 2017 documents, which was attended by all the involved teams ranging from Directors to laboratory analysts several times starting from the understanding of ISO 17025: 2017 for 2 days, 1 and 2 February 2018 by inviting resource assessors to the National Accreditation Committee, then the drafting process.



Figure 4. Photographs of ISO 17025: 2017 Training Activity

The ISO 17025: 2017 quality guidance document is discussed and corrected directly by the resource person. Until now, FMIPA Laboratory Service Quality Document of the University of Pakuan Quality Guide has been produced as a document that will be used for filing KAN accreditation.

Calibration of analytical tools

Furthermore, for the preparation of validation, the analytical method that will be used for analytical services is carried out in understanding Validation training. Methods of analysis and calculation of uncertainty according to ISO 17025: 2017 standards. Calibration of the equipment is carried out in the Calibration Center of the Agro-Industry Center for glass tools such as volumetric flasks, measuring pipettes, burettes and for instruments such as balance sheets, ovens, furnaces, and spectrophotometers.



Figure 5. Photographs of Chemical Equipment that has been calibrated

K3 Training Activities at Faculty of Mathematics and Natural Science Service Laboratory, Pakuan University

Faculty of Mathematics and Natural Science Pakuan University Service Laboratory is a service laboratory for the community both students and the public. The service is in the form of analysis and training services. One of the training that was recently conducted was training in Occupational Health and Safety (K3). Occupational safety and health in question are all conditions and factors that can have an impact on the occupational safety and health of workers and others in the workplace. K3 training in the laboratory is very important in improving laboratory competence to support occupational safety and health in the laboratory. In this regard, in arousing the passion and spirit of K3 culture in the business world and the world of work, the Occupational Safety and Health Training (K3) will be held in the Laboratory.

The target of the K3 Training provided is to increase knowledge, understanding and importance of occupational safety and health (K3) in the Laboratory,

support awareness of the application of K3 which influences the value of investment, product quality and quantity, increase participation of all parties in K3 implementation, encourage practitioners, Academic / College in improving the quality of K3 human resources in Indonesia and obtaining certificates that can be used as SKPI (Certificate of Companion) for students who will graduate.



Figure 6. Documentation of activities regarding Handling and Safety of Tools in the Laboratory



Figure 7. Documentation of training activities regarding the theory and practice of fire suppression



Figure 8 Documentation of activities regarding hazards and risks of working in a laboratory and emergency response practices and the use and maintenance of PPE (Personal Protective Equipment).

IV. CONCLUSION

1. Faculty of Mathematics and Natural Science Service Laboratory Pakuan University that is accredited by the National Accreditation Committee (KAN) can be one of the campus intellectual business units that can improve the quality of the results of chemical analysis and quality of lecturer and student publications in Pakuan University and improve the welfare of Pakuan University lecturers and employees.

2. The scope of the analysis services provided can be increased for Microbiology and Pharmacy analysis services so that the analysis services provided are more and can facilitate all students of Faculty of Mathematics and Natural Science Pakuan University.

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