



## **Analysis of Learning Outcome Achievements and Support of Lecturer Competencies towards International Accreditation**

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### ABSTRACT

Learning Outcome (LO) is a formulation of learning outcomes expected to be met by students. LO is structured to equip the competencies that graduates want to achieve. Each course in a program carries LO content that students must achieve. Through the Semester Learning Plan (RPS) prepared by expert lecturers, it will be seen how the LO is provided through the learning process and how to measure it. This study aims to analyze the achievement of LO in 8 (eight) Study Programs at the University of Bengkulu's FKIP which are being proposed for international accreditation. This LO achievement analysis is also linked to the competence of lecturers. The LO used by the 8 Study Programs to meet the requirements of the IQF is in line with international frameworks, one of which is the European Qualification Framework (EQF). Therefore, the results of this study support the quality assurance of a program or institution in achieving one of the components of international accreditation. The results of this study found that the scientific fields of the lecturers in each study program were in accordance with the qualifications (qualified) and could be accounted for which was strengthened by the fact that almost all lecturers had the status of certified lecturers. This is supported by the number of reputable national and international publications, scientific works that are registered with copyrights, works in the form of books or book chapters that are registered with ISBNs and others. In addition, learning outcomes have been measured in each program and show readiness towards international accreditation.



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## BACKGROUND

Learning Outcome (LO) is a formulation of learning outcomes that must be achieved by students (Mahajan & Singh; 2017). These learning outcomes determine a student's new behavior after their learning experience. The learning process carried out shows how LO can be achieved. LO is demonstrated through knowledge, attitudes and skills. Therefore, LO is expressed with operational verbs. LO is specifically described in courses into Courses Learning Outcomes (CLO) and Lesson Learning Outcomes (LLO). Each course has the task of providing LOs according to the field of study. Therefore, the LO percentage in each course will vary.

The competencies provided in the LO, CLO, and LLO formulations refer to the competencies required in the Indonesian National Qualifications Framework (IQF) according to their level (Bachelor's level 6, Master's Level 8, and Doctoral Program level 9). This IQF is equivalent to other qualification frameworks in several countries such as in Europe through the European Qualification Framework (EQF). Referring to the IQF competencies, the LO, CLO, and LLO provided are Attitudes and Values; General and specific knowledge; as well as general and specific skills (Director General of Learning & Student Affairs, 2015)

In the learning process that provides LO also pays attention to student diversity (gender, religion and ethnicity). Therefore, the approaches and methods used are various challenging strategies and techniques, encouraging students to collaborate, think critically, explore, be creative and experiment by utilizing various learning resources (Vu, 2014). Each lesson prioritizes a scientific approach with an inductive method, including by applying learning models based on problem solving, discovery-inquiry, and project-based learning so that the competencies required in the IQF (Attitudes and values; general and special knowledge; general and special skills ) can be provided optimally to students.

Referring to the learning process that has been stated, the assessment carried out is an authentic assessment to measure the competencies required in LO. This assessment consists of tests, performance, product assessments, projects, case studies, and others (Vu & Alba, 2014; Sokhanvar et al., 2021; Clark, 2008). Each course develops its own LO assessment design according to the LO achieved and the characteristics of the course concept through LLO and CLO measurements.

The results of LLO, CLO and LO achievements each year are used as a basis for regular improvements. Improvements to lesson plans, implementation of learning, and assessment of learning (Schultz et al., 2021). Improvements are made so that LO can be achieved optimally by graduates to achieve the formulated graduate profile.

Lecturers periodically improve learning methods, use various evaluations, update course studies, integrate research results into learning, use various media, and various learning innovations that produce student-centered learning. The improvements made will directly improve the quality of lecturers.

Student centered learning is a learning design that is requested in every quality assurance learning process for a program, both nationally and internationally. Therefore, LO analysis and support for lecturer competence in providing LO is one of the efforts to optimize quality assurance of a program at the national and international level.

## METHOD

The idea of analyzing LO achievements and their relationship to lecturer competency as preparation for international accreditation can be achieved through a descriptive analysis research design. The research subjects were 8 study programs at FKIP Bengkulu University (Bachelor of Science Education, Bachelor of Chemistry Education, Bachelor of Physics Education, Bachelor of Biology Education, Bachelor of Mathematics Education, Master of Science Education, Master of Mathematics Education, Doctor of Education). Data collection techniques use observation of curriculum documents, Lesson plan, and assessment documents. Qualitative and quantitative data analysis techniques. The research procedures are presented as in Figure 1:

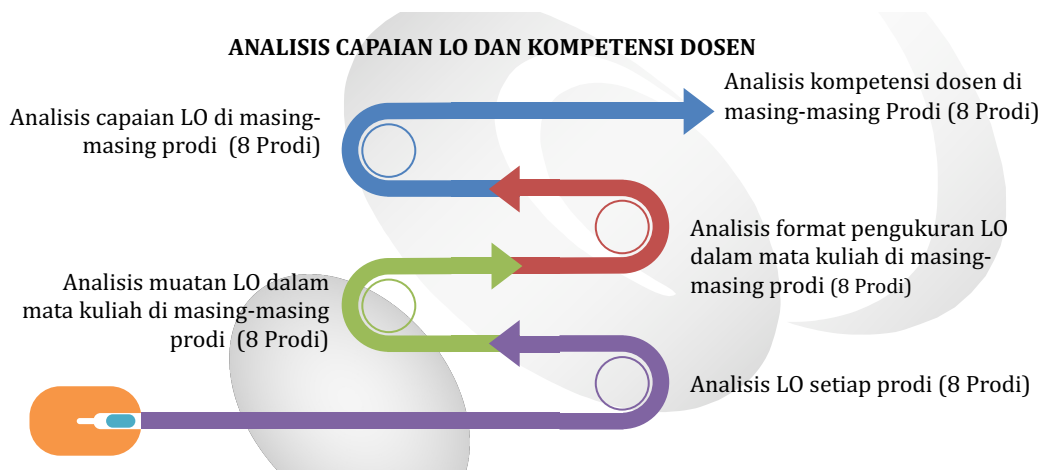


Figure 1. Research Procedure

## RESULTS AND DISCUSSION

### Analysis of Lecturer Competencies in Each Study Program

Lecturer competency is one of the factors that influences the achievement of learning and education goals, including learning outcomes (LO). According to Mahajan & Singh (2017) Learning Outcome (LO) is a formulation of learning outcomes that students must achieve which is influenced by the competencies possessed by each lecturer or teacher. Lecturer competency is influenced by several other factors such as educational background, teaching experience and time in teaching (length of teaching) and other factors that indirectly influence a lecturer's competency.

The competency of lecturers in 8 study programs at FKIP Bengkulu University meets the criteria determined by the government by analyzing positions and workload, as well as the knowledge required by each study program. The study program itself submits applications to several lecturers outside the study program whose knowledge they need to teach courses, become academic advisors, and so on.

Lecturer recruitment is carried out professionally with high competition/precision, lecturer competencies are in line with the targeted LO, lecturers are given the opportunity for self-development. Lecturer achievements or academic competence can be seen from scientific publications and their reputation at national and international levels. In line with the opinion of Noermanzah (2015) that the role of lecturers in this era of globalization is not only limited to teaching but also must have the ability to communicate well with students, colleagues and the community, be creative and productive, have a high work ethic and commitment to work, always develop themselves. continuously at national and international levels as proven through books, HaKI, patents, publications in reputable national and international journals.

To support the role of lecturers, their educational background and expertise play a very big role in achieving the expected learning outcomes (Nento, 2018). Academic qualifications are seen from the suitability of academic education to the task. For example, lecturers with master's degrees can teach for diploma or undergraduate programs and lecturers with doctoral degrees can teach in diploma, undergraduate and postgraduate programs. This academic qualification is also an indicator of the embodiment of a competent lecturer. Competency itself can be interpreted as a set of knowledge, skills and behavior that must be possessed, internalized and mastered by lecturers in carrying out their duties professionally. Appropriate academic qualifications meet established competency standards. The lecturer profiles from 8 study programs to support international accreditation are presented in Table 1 for undergraduate programs, Table 2 for master's programs and Table 3 for Doctoral programs.

Table 1. Lecturer Profile in Bachelor Program

<b>Functional Position</b>	<b>BNSE</b>	<b>BPE</b>	<b>BCE</b>	<b>BBE</b>	<b>BME</b>
Profesor	2	2	1	2	1
Associate Profesor	8	11	-	7	7
Assistant Profesor	4	3	11	5	5
Assistant Profesor	3	3	-	2	2
Teaching Staff	3	-	-	1	4
<b>Academic Qualification</b>					
Doctoral	12	10	7	7	8
Master	8	9	5	10	12
<b>Certification</b>					
Certification	17	18	10	14	13
Non-Certification	3	1	2	3	7

*BNSE = Bachelor in Natural Science Education, BPE= Bachelor in Physics Education, BCE= Bachelor in Chemistry Education, BBE= Bachelor in Biology Education, BME = Bachelor in Mathematics Education*

Table 1 illustrates that the functional positions of most of the lecturers are already associate professors and some are in the process of becoming professors. Most academic positions also have doctoral degrees and are certified as professional lecturers. This is a good condition to support accreditation, both national and international accreditation.

Several lecturers have also received research funding that can optimize the learning process as a learning outcome (LO) achievement. Funding for this research is in the form of superior basic research funds for universities (PDUPT) from the ministry, international collaborative research grants from universities and learning development grants from faculties. Apart from that, physics education lecturers receive several programs such as World Class Professor (WCP) in collaboration with the Bandung Institute of Technology as well as a visiting scholar program to the University of Maryland USA, lecturer participation in scientific meetings and workshops both domestically and abroad. Some of the workshops that have been attended are the Asia Pacific Center for Theoretical Physics (APCTP) Workshop in the Philippines in 2019, the International Center for Theoretical Physics (ICTP) Workshop in 2019 in Samarkand, Uzbekistan, and the Scientific Writing Workshop organized by the Physics Education Study Program through WCP program. Physics education lecturers become speakers at various workshops and seminars with the theme of ICT-based learning media. Lecturers also carry out scientific development through scientific writings that have been published in reputable scientific journals both nationally and internationally.

Lecturers have excellent recognition of their expertise and performance achievements at regional, national and international levels. A total of 78 recognitions at regional, national and international levels have been achieved by 12 Chemistry Education lecturers. Some examples of this recognition include PSG Assessor-PLG Tutor (Indonesian Ministry of Education and Culture), Visiting Lecture (University of Malaya), MIT Visiting Scholar (United States of America), Imperial College London (UK) Visiting Scholar, Mercury Detector IPR Copyright Holder, Editor of the Indonesian Journal of Environmental Management and Sustainability, Recognition from the US Department of States in completing the Fulbright scholarship program, etc. Apart from that, lecturers also carry out scientific development through scientific writings which have been published in international and national scientific journals.

Master's program lecturers have doctoral academic qualifications, therefore all lecturers in the Master of Science Education have doctoral degrees. During the last three years, research funded abroad was 13, funded outside universities 35, and funded by universities and independently was 75. The number of publications in reputable national journals was 146 and in reputable international journals was 150. International recognition was 36, National 56, and locally 74. Apart from producing scientific papers published in reputable journals, he also produced 12 works whose copyrights were registered, 34 books or book chapters whose ISBNs were registered and 88 TTGs consisting of natural medicinal plant simplicia, Virgin Coconut Oil, liquid fertilizer made from Bengkulu's natural potential.

Table 2. Lecturer Profile in Master Program

Functional Position	MNSE	MME
Profesor	8	1
Associate Profesor	5	5
Assistant Profesor	4	1
Assistant Profesor	1	-
Teaching Staff	-	-
<b>Academic Qualification</b>		
Doctoral	18	7
Master	-	-
<b>Certification</b>		
Certification	17	6
Non-Certification	1	1

*MNSE = Magister in Natural Science Education, MME = Magister in Mathematics Education*

100% Mathematics Masters Education Lecturers have doctoral degrees, certified professional lecturers. One lecturer holds the functional position of Professor, five lecturers hold the functional position of Associate Professor, and one lecturer holds the functional position of Lector as in table 5. This is supported by the number of lecturers' international publications which have reached 25 scientific works, 16 of which were published in reputable international journal. Teaching staff are also active in conducting research, either funded or independently. In terms of lecturer recognition, Prof. Dr. Wahyu Widada, M.Pd has been an Invited Speaker in the International Seminar & Workshop on Educational & Design Research Postgraduate Program at Padang State University. This is supported by more than 400 citations from the articles he has published, which shows the high level of recognition of this lecturer. The profile of lecturers in the Doctoral Program in Educational Sciences can be seen in Table 6. 55% hold the functional position of professor, 32% associate professor, and 13% lecturer. All lecturers have been certified. Lecturers have academic achievements seen from scientific publications and have national and international reputations.

Table 3. Lecturer Profile in Doctoral Program

Academic Qualification	Sum	
	Person	Percentage
<b>Education</b>		
Doctoral	22	100%
<b>Functional Position</b>		
Professor	12	55 %
Associate Profesor	7	32 %
Assistant Profesor	3	13%
<b>Certification</b>		
Certification	22	100%
Non-Certification		

Lecturers who teach courses in each study program are in accordance with their field of expertise and are able to fulfill the core competencies to achieve LO. Law number 14 of 2005 also regulates the certification of educators (lecturers). This certification test aims to clarify the position of educators (lecturers) as professionals. A lecturer who has received an educator certificate can be said to be a professional lecturer and has fulfilled the competencies as a lecturer. This is supported by scientific publications in reputable international and national journals, copyrighted scientific works, books or book chapters with ISBN and so on. This competency can be the main capital towards international accreditation. According to (Levin et al., 2006), the benchmarks for achieving world class (international) accreditation are having excellence in research - research quality,

productivity and research creativity - demonstrated by international publications and having graduates who can easily work anywhere.

#### Analysis of LO Achievements of Each Study Program

The curriculum used in each PS is an outcome-based education (OBE) curriculum using a case method or project-based learning model. Learning is equipped with an information system <https://elearning.unib.ac.id/> which can be utilized by lecturers and students through asynchronous lectures. Each course developed in each study program carries LO content -Knowledge and understanding, Skills, and Autonomy and Responsibility components-to meet the needs of graduate profiles. The distribution of LOs in each course is adjusted to CLOs and LLOs which are equipped with ways to achieve LLOs, as well as ways to evaluate their achievements, all of which are presented in the semester learning plan (SLP). SLP is equipped with learning attributes such as lecture contracts, teaching materials, worksheets, assignment formats, assessment instruments, assessment rubrics, and learning media. Apart from that, the assignment format, UTS and UAS grid, process assessment criteria and the end of learning are mutually agreed upon for assessment transparency. Implementation of the learning process uses student-centered learning which requires students to be active and able to collaborate. This is to support the demands of all university accreditation institutions which demand student centered learning in the learning process by accommodating student diversity in terms of learning styles, gender, ethnicity, culture, religion and other diversity.

The depth and breadth of the course concept is determined by analyzing LO content, formulating CLP and LLO, formulating course descriptions, mapping study materials, formulating assessment indicators, criteria and forms of assessment, and determining the form of learning (offline, online and blended learning). For international accreditation, it is not only the international standard curriculum that needs to be prepared but also all the completeness of the learning process such as achieving student learning outcomes (Agung & Santosa, 2017). Achievement of student learning outcomes is assessed during the process and at the end of learning using various assessment methods. Assessment is carried out by evaluating the assignments carried out by students, the results of discussions and group work, quizzes, mid-semester exam results and final semester exam results. For practicum courses, the assessment component also includes the results of the practicum assessment. Learning assessment includes assessing learning processes and outcomes. This assessment refers to the Decree of the Chancellor of Bengkulu University Number 37 of 2016 and Number 25 of 2020. The final course grade is calculated from the assignment grades, mid-semester exams and final semester exams. The benchmark reference assessment standard (PAP) is used in the assessment with a distribution of A, A, B+, B, B-, C+, C, C-, D+, D and E. The passing criteria for each subject is a minimum of reaching the Sufficient category with an ability score of 55 -59. Course grades are uploaded by the lecturer on the Unib academic portal on the page <https://pak.unib.ac.id/>. The assessment principle refers to authentic assessment which is equipped with assessment rubrics and evidence of student portfolios.

In the learning process, apart from providing main learning facilities such as buildings and equipment, indoor laboratory facilities such as science, physics, chemistry, biology laboratories and outdoor laboratories such as the Turtle Learning Center/TLC, science park and biology garden are also supported. This facility is open to students, lecturers, researchers, teachers and students who will visit to study and research related to conservation education, especially turtle conservation. Lecture substance is oriented to philosophical, theoretical, technical and applied dimensions which include aspects of knowledge, attitudes and values, and skills with an emphasis on theoretical and practical skills. Research results are integrated into learning through enriching material content, developing practical topics, presenting examples with real context, developing teaching materials, as well as best practices for schools to adopt through community service activities. LO Achievement Results in the Undergraduate Program can be seen in Figure 2.

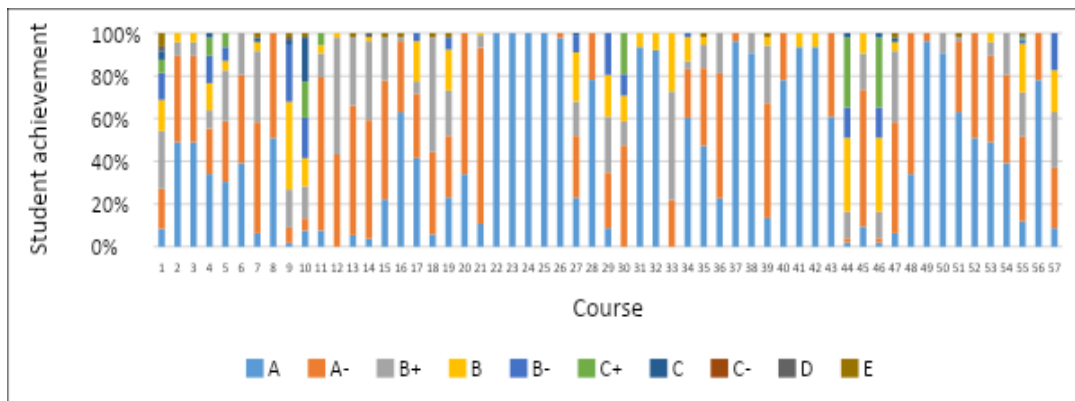


Figure 2a. Evaluation of Bachelor of Natural Science Education Courses

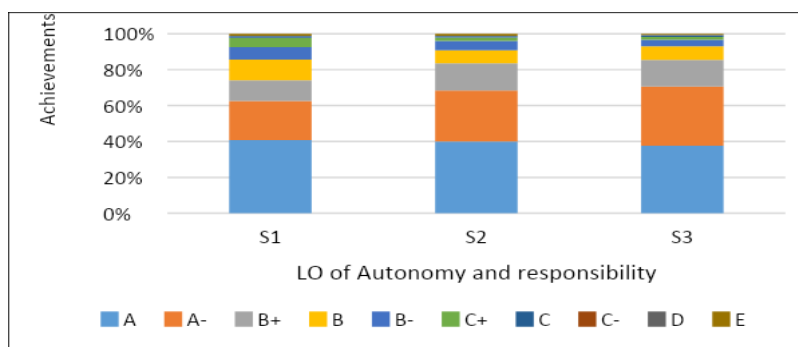


Figure 2b. Achievements of LO Autonomy and Responsibility of Bachelor of Natural Science Education

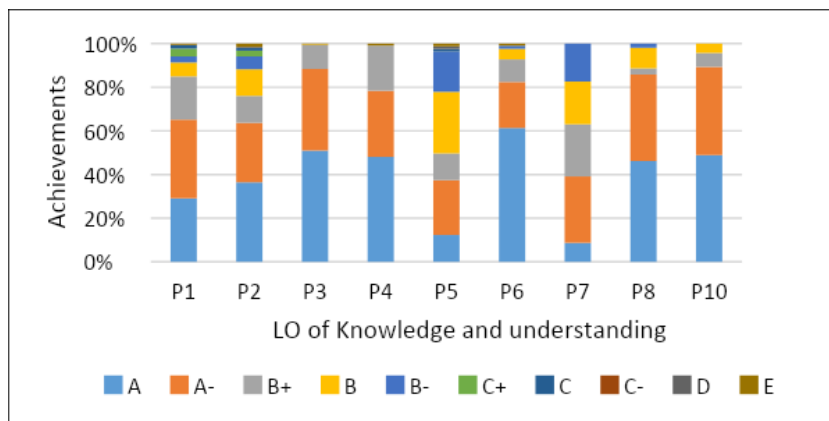


Figure 2c. LO Achievements Knowledge Dimensions of Bachelor of Natural Science Education

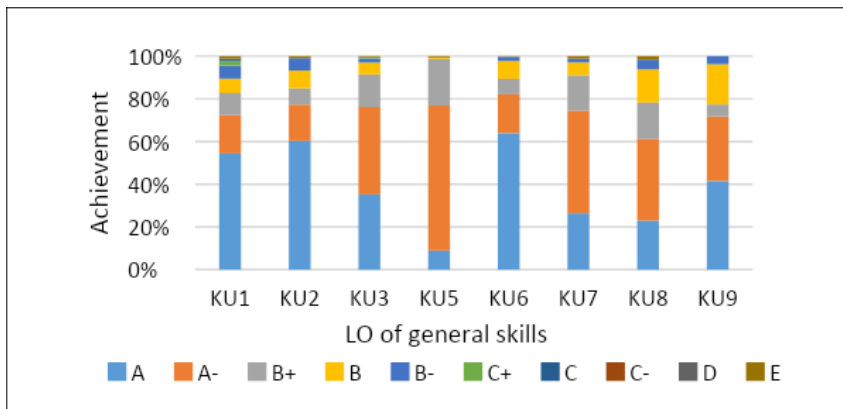


Figure 2c. LO Achievements General Skills Dimensions of Bachelor of Natural Science Education

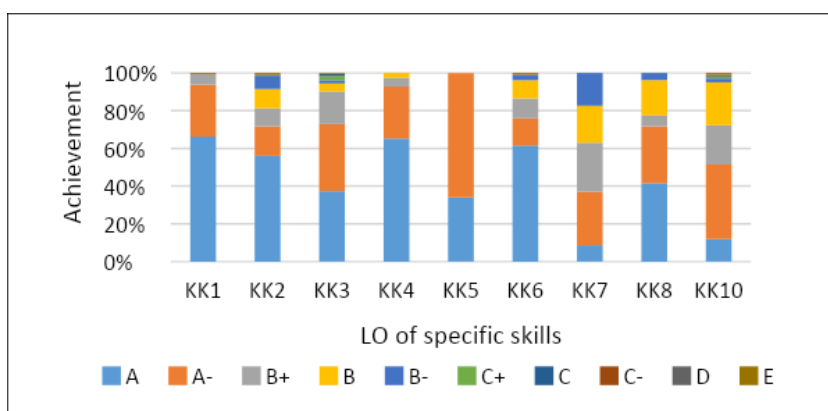


Figure 2d. LO Achievements Special Skills Dimensions of Bachelor of Natural Science Education

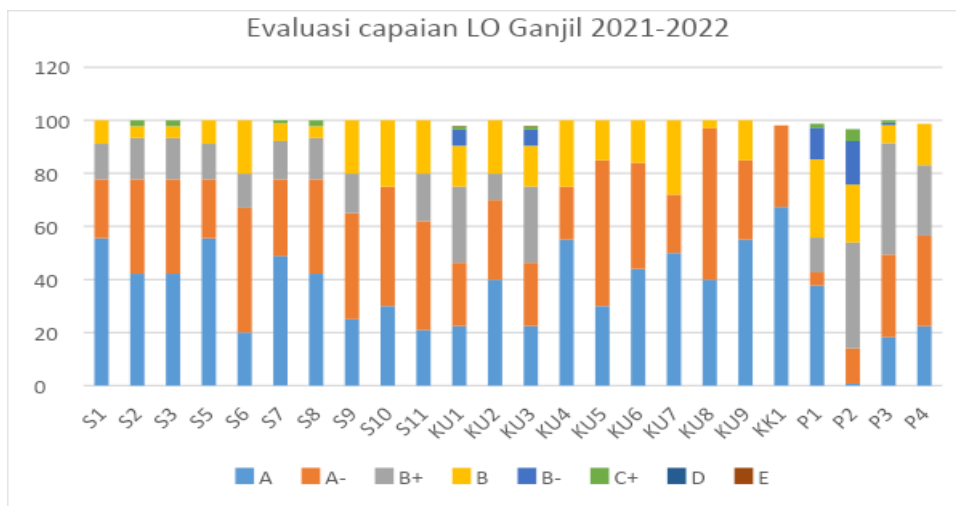


Figure 2e. Evaluation of LO 2021-2022 Academic Year achievements for Bachelor of Physics Education



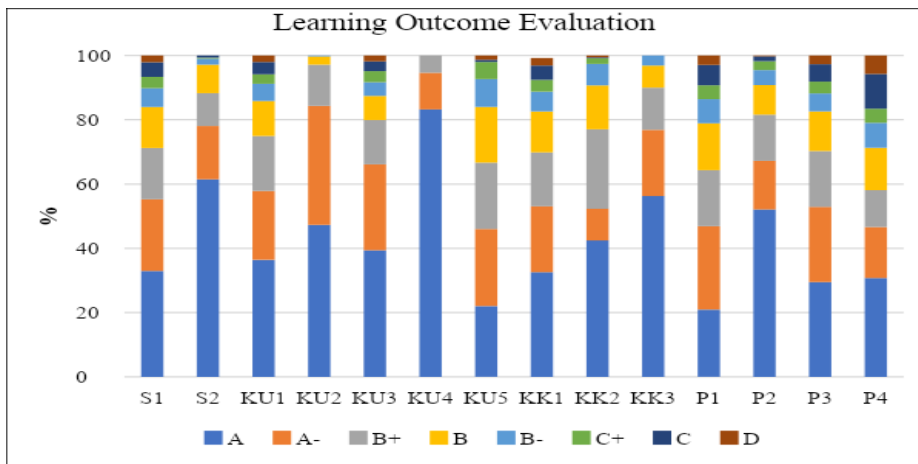


Figure 2f. Results of Evaluation of LO Achievements of the Chemistry Education Study Program

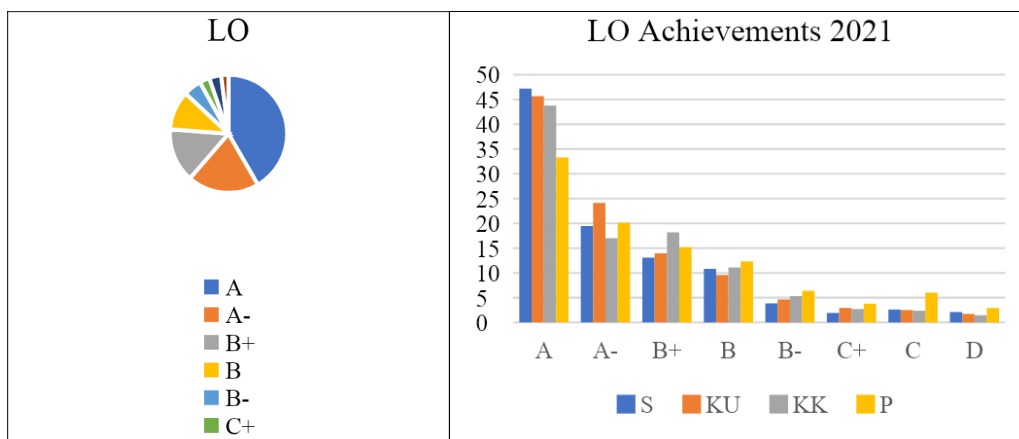


Figure 2g. LO achievement map per S, KU, KK and P aspects in Chemistry Education

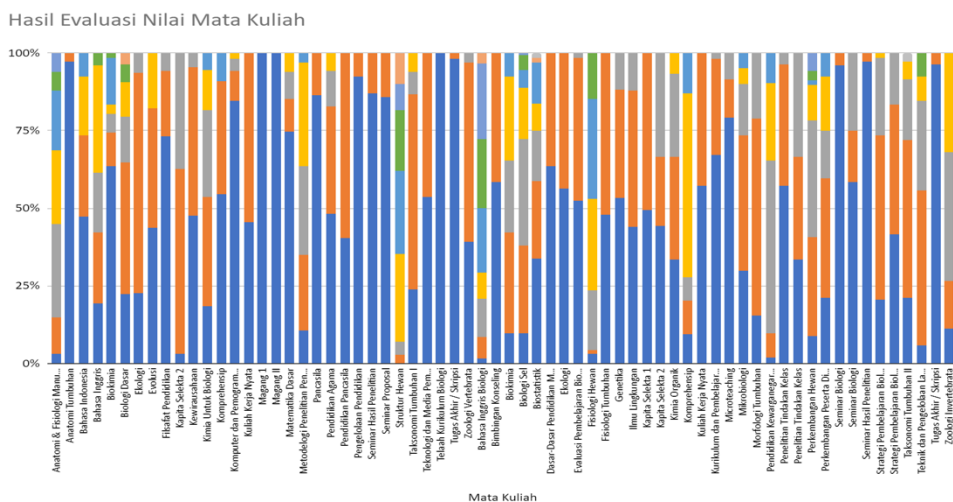


Figure 2h. Results of Evaluation of Courses in Biology Education

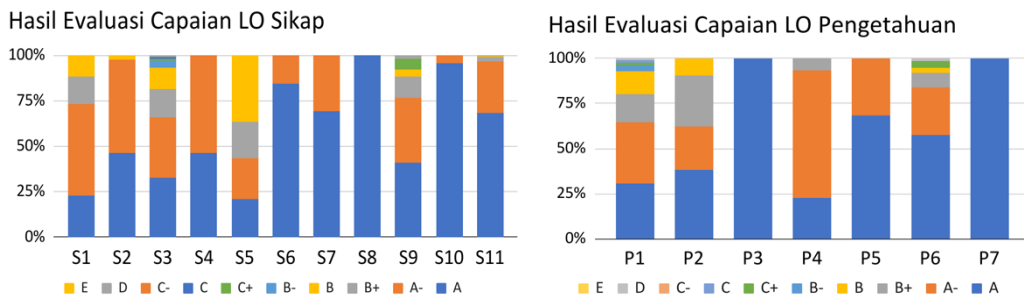


Figure 2i. Results of Evaluation of Learning Achievements that Include Attitude and Knowledge Components in Biology Education

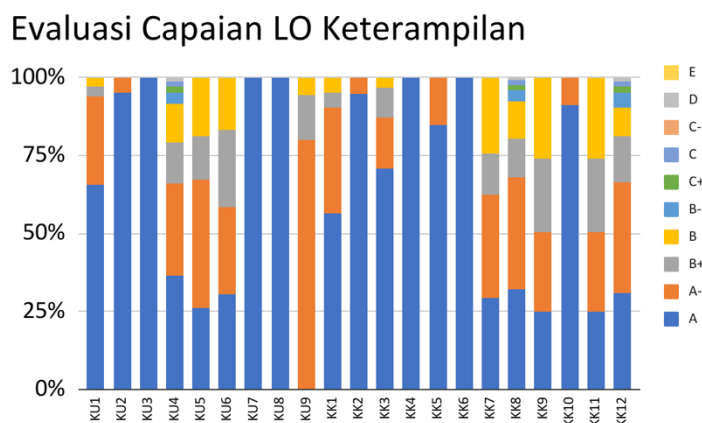
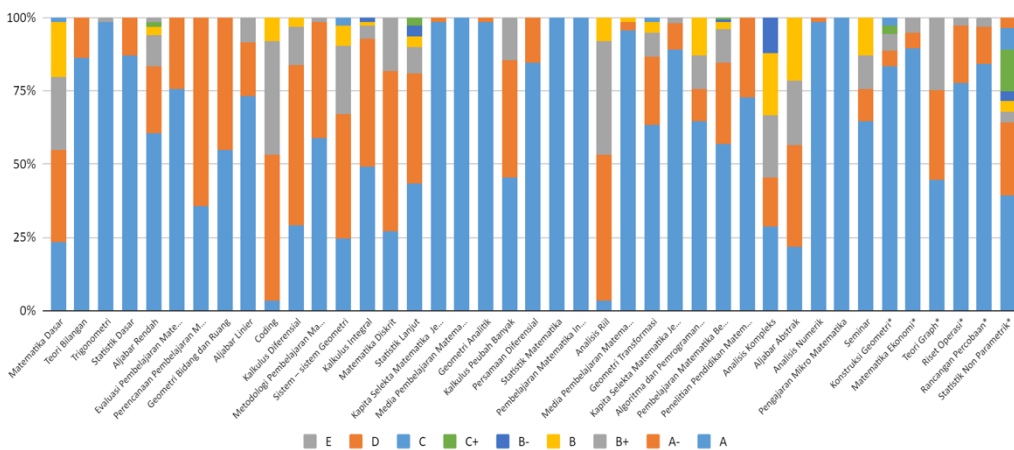


Figure 2j. Results of Evaluation of LO Achievements on Skill Dimensions in Biology Education



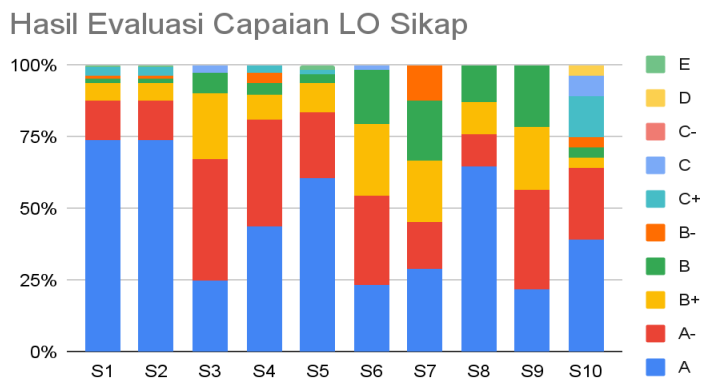


Figure 2l. LO Evaluation Results of Attitudes in Mathematics Education

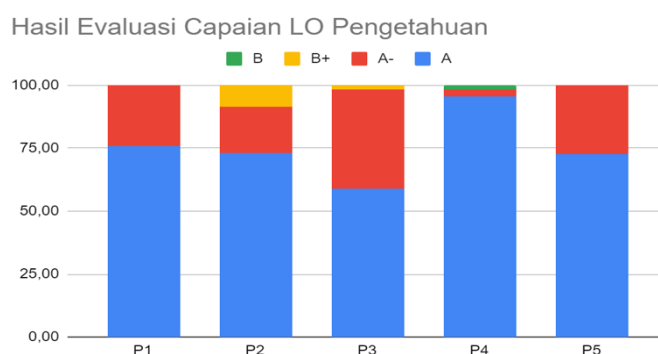


Figure 2m. LO Knowledge Evaluation Results in Mathematics Education

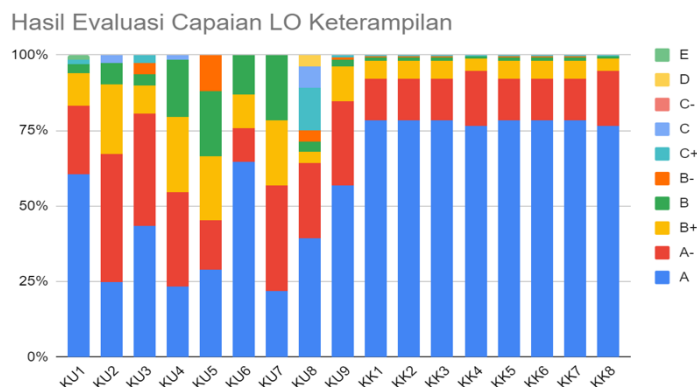


Figure 2n. LO Skills Evaluation Results in Mathematics Education

The learning system in the Master of Science Education program is to produce three profiles of graduates with an insight into Natural Conservation Education for a Better Life which generally aims at green economics (GE), namely harmony between the use and preservation of biological diversity. The approach and methods used are challenging, encouraging students to collaborate, think critically, explore, be creative and experiment by utilizing various learning resources. Each lecture prioritizes a scientific approach with an inductive method by applying learning models based on problem solving, discovery-inquiry, and project-based learning. The assessment carried out is an assessment of the process and results. The 30 courses presented are in accordance with techniques, instruments and principles and refer to authentic assessments (tests, performance,

product assessments, projects, case studies, etc.) which are equipped with assessment rubrics and evidence of student portfolios.

The Mathematics Education Masters Study Program carries out the learning process as follows: (1) Implementation of the learning process includes interactions between lecturers and students carried out through face-to-face (offline), online (online), independent studies, seminars, field studies and practicums as well as blended learning, (2 ) Learning resources, namely textbooks, modules, Student Worksheets, Hand Outs, Videos, (3) Monitoring the suitability of the process to the learning plan, namely before the lecture, the RPS made by the lecturer is checked. Monitoring the implementation of the lecture and final evaluation of its implementation; (4) The learning methods developed are student-centered learning methods such as the Case Method, Project Based Learning (Team-Based Project), and group discussions. Furthermore, the assessment of student learning processes and outcomes is intended to measure student study progress. The results of the learning evaluation in the Master of Science Education and Mathematics Education programs are presented in Figure 3.

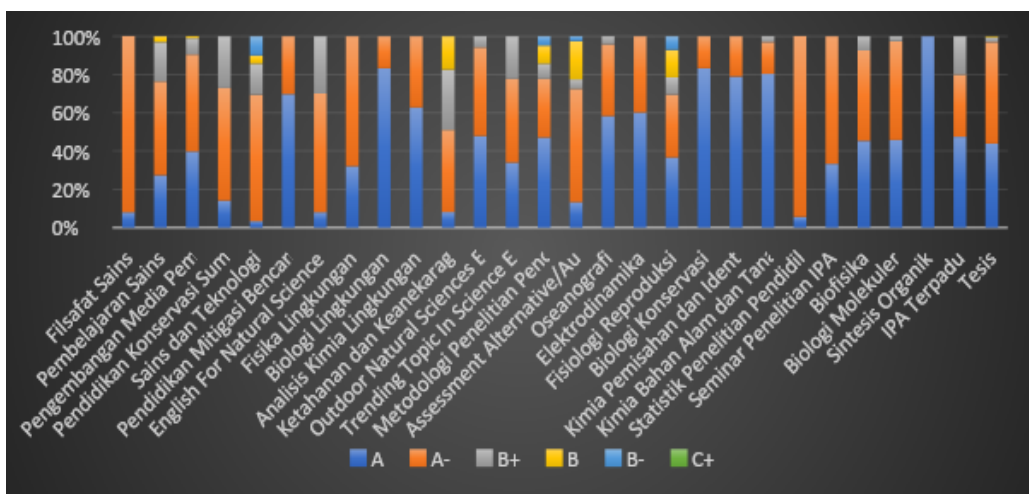


Figure 3a. Results of Evaluation of Course Achievements in the Master of Science Education

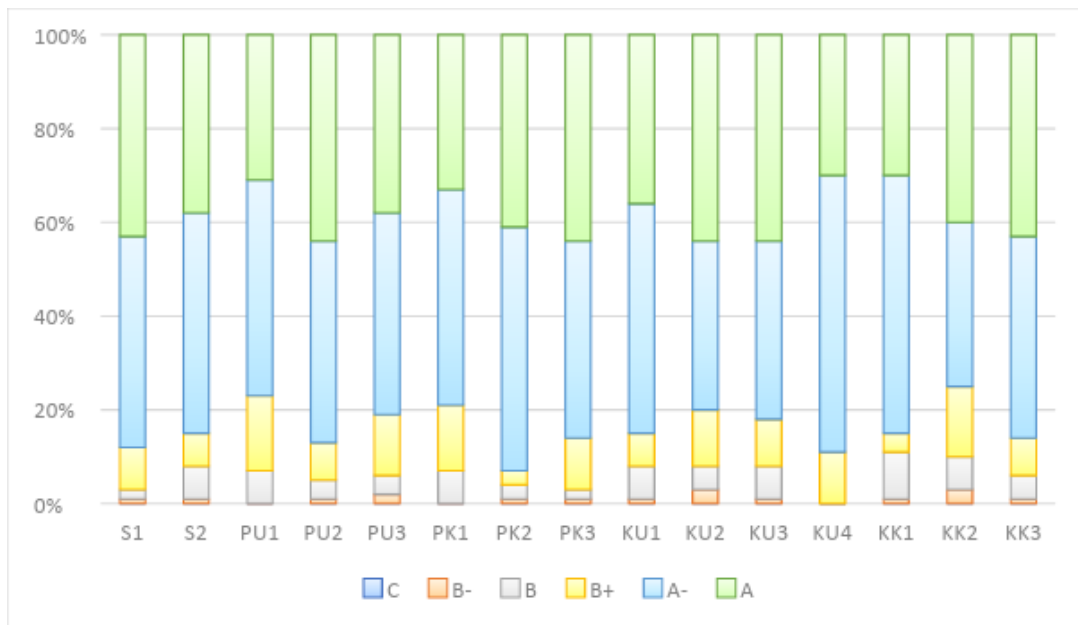


Figure 3b. LO Evaluation Results in Master of Science Education

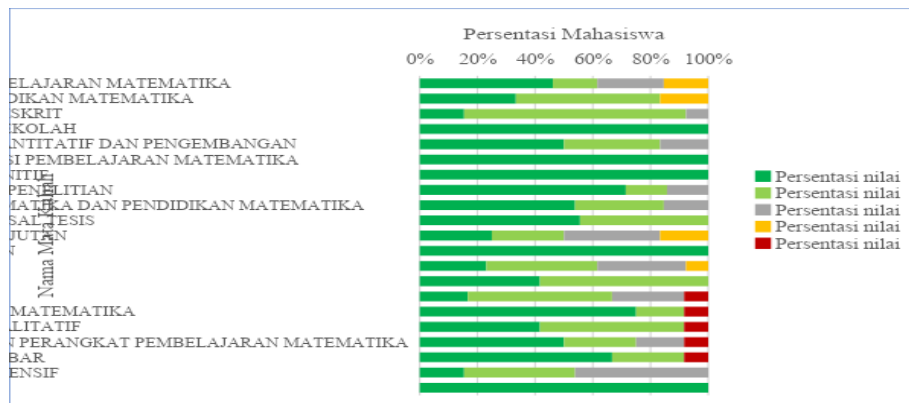


Figure 3c. Student Learning Evaluation Results of Magister Mathematics Education

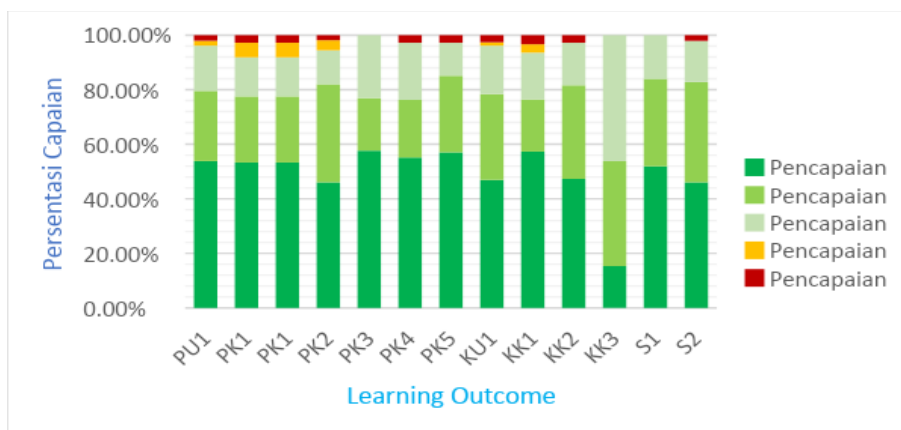


Figure 3d LO Achievement Evaluation Results of Magister Mathematics Education

The learning system in the Doctor of Education Study Program uses a student-centered learning approach. In order to complete their studies, Doctor of Education Study Program students must fulfill their cumulative study load. The results of the evaluation of course achievements in the Doctoral Education study program as a whole show that the quality of the learning process is in the very good category in each component, including pedagogic, professional, personal and social. Overall learning outcomes in the doctoral program are depicted in Figure 4.

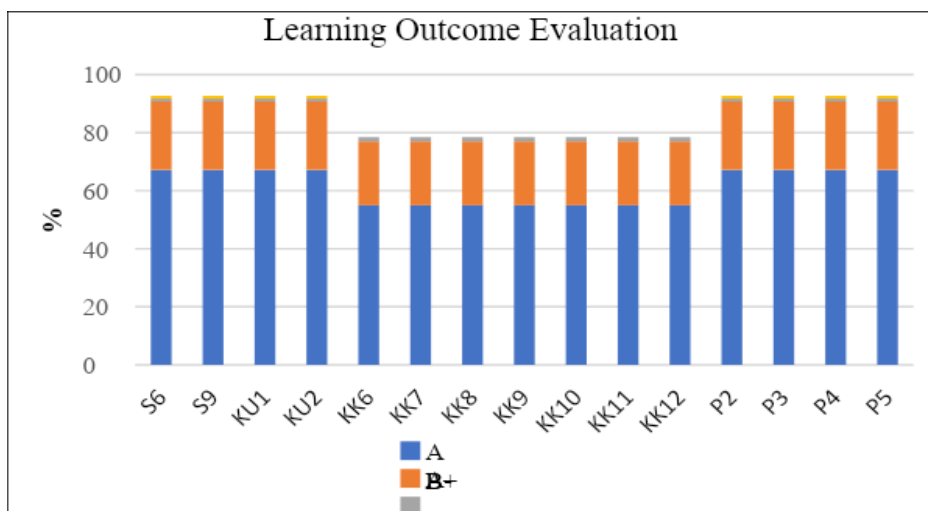


Figure 4. Results of Evaluation of LO PS Doctor of Education Achievements

Based on the data above, learning outcomes in the 8 study programs require students to be able to master theories, concepts, and principles, solve problems within a simple scope using the knowledge they have learned, and be responsible for the work they do. The conditions and preparations that have been carried out by each FKIP Faculty of Bengkulu University study program show that they are ready for international accreditation based on outcomes-based education (OBE). According to (Mausoom & Vengadeshwaran, 2021) in the international recognition process, evaluation using OBE is the main reference criterion for focusing on improving the abilities that students can carry out at the end of the learning process.

### CONCLUSION

The conditions and system for administering the Bengkulu University FKIP faculty study program (8 study programs) are running well, dynamic, and active where based on the analysis of lecturer competency it can be concluded that the scientific fields of the teaching staff or lecturers in each study program are following the qualifications (qualified) and can be accounted for which is reinforced by the fact that almost all lecturers have certified lecturer status. This is supported by the number of reputable international and national publications indexed by Sinta, scientific works registered with copyright, works in the form of books or book chapters registered with ISBN, and so on. Apart from that, learning outcomes taking into account the conditions and preparations that have been carried out by each study program of the FKIP Bengkulu University faculty show that they are ready for international accreditation.

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