



Commonity Development Through Comparison Of Learning Methods And Obe-Based Civil Engineering Curriculum At Putra Malaysia University

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ABSTRACT

Penyempurnaan kurikulum berbasis OBE memerlukan penguatan yang berbasis pada perbandingan dan pengalaman dalam pelaksanaannya. Metode pelaksanaan pengabdian yang digunakan adalah partisipasi aktif yang berbasis pada perbandingan metode pembelajaran yang digunakan dengan kurikulum yang dirancang. Hasil pengabdian yang diperoleh berupa rancangan pengembangan kurikulum berbasis OBE Teknik Sipil yang komprehensif ditinjau dari input dan output yang dihasilkan. Bentuk kerjasama kemitraan kelembagaan yang berkelanjutan dirumuskan secara bertahap dan diupayakan pelaksanaan kebijakan pengembangan keilmuan. Perbandingan kurikulum Teknik Sipil UPI-UPM dilakukan melalui FGD (Forum Group Discussion) dengan metode interaktif. Kelompok keahlian memberikan pendapat dan argumentasi terkait penerapan mata kuliah dan beban mahasiswa dalam melaksanakan pembelajaran di Teknik Sipil. Penetapan kerangka kurikulum dan pelaksanaan OBE dilakukan secara terukur dengan menerapkan instrumen Washington Accord sebagai acuan penyelenggaraan Kurikulum Teknik Sipil. Perbandingan kurikulum OBE Teknik Sipil m-UPI – UPM menghasilkan pendekatan kolaboratif dalam penyelenggaraan kegiatan akademik yang mendorong pengembangan lebih lanjut pada tahapan penyelenggaraan kegiatan akademik berikutnya. Pengembangan kurikulum OBE berdasarkan standar Washington Accord untuk Teknik Sipil UPI dan UPM memerlukan implementasi yang lebih teknis dan kolaboratif. Perjanjian kerja sama akademik Teknik Sipil UPI-UPM akan ditindaklanjuti dengan kerja sama akademik yang komprehensif dengan komunikasi akademik yang lebih intens.

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ABSTRAK

Improving the OBE-based curriculum requires strengthening based on comparison and experience in its implementation. The method of implementing the service used is active participation based on a comparison of the learning methods used and the designed curriculum. The service results obtained are a draft design for developing a comprehensive Civil Engineering OBE-based curriculum in terms of the input and output produced. Forms of sustainable institutional partnership cooperation are formulated in stages and efforts are made to implement scientific development policies. The comparison of the UPI-UPM Civil Engineering curriculum was carried out through FGD (Forum Group Discussion) using an interactive method. Expertise groups provide opinions and arguments related to the application of courses and student loads in carrying out learning in Civil Engineering. Determination of the curriculum framework and implementation of OBE is carried out in a measurable manner by applying the Washington Accord instruments as a reference for administering the Civil Engineering Curriculum. The comparison of the Civil Engineering OBE curriculum m-UPI – UPM produces a collaborative approach to implementing academic activities that encourages further development at the next stage of implementing academic activities. The development of the OBE curriculum based on the Washington Accord standards for UPI and UPM Civil Engineering requires a more technical, collaborative implementation. The UPI-UPM Civil Engineering academic collaboration agreement will be followed up with a comprehensive academic collaboration with more intense academic communication.

Keyword:

Curriculum Comparison, Civil Engineering, Outcome base Education, UPI, UPM

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1. INTRODUCTION

Based on the Accreditation Board for Engineering and Technology (ABET) guidelines implementing an OBE-based curriculum requires accelerating the use of technology and the pace of innovation in the production process is growing very quickly, creating a gap between the world of education, the needs of Human Resources (HR) in the world of work, and society. The main challenge in 21st-century education is determining roles and strategies to overcome the gap between the educational process in higher education and the needs of the world of work and demands for innovation Aisjah A.S. (2019). One approach used to accommodate 21st-century education(Azli, N.A. 2022) is Outcome-Based Education (OBE).

OBE is education based on Learning Achievements with reference to the study program educational objectives that have been formulated. Base on American Society of Civil Engineers (ASCE) the OBE principle is the constructive alignment of Learning Outcomes, learning methods, and assessment, which is a continuous development process following the PDCA (Plan-Do-Check-Act) cycle(Arifin S., et.al., 2018). OBE is an approach that focuses on the continuity of an innovative, interactive, and effective learning process(BPPSDMK Kemkes., 2022). The OBE approach covers all aspects of the educational process, starting from curriculum design, formulating objectives/graduate profiles and formulating learning outcomes, educational strategies, learning methods, and assessment procedures, to the overall educational environment by implementing the principles of focusing on achieving the study program's educational goals and learning outcomes(Biggs, J. 1996).

Based on General Criteria dan Program Criteria dari Accreditation Board for Engineering and Technology (ABET) formulation of study program educational objectives by considering various external conditions in determining the competencies that graduates need to have when starting their careers. Next, the study program determines the learning outcomes of graduates based on the study program's educational objectives to be realized(Christofer, et.al., 2022). Designing a curriculum based on learning outcomes (outcome-based curriculum). Outcome-based curriculum has a main focus on the desired results of the learning process, not just on the learning material or activities themselves. In other words, this approach emphasizes the achievement of skills, knowledge and attitudes that can be measured and observed concretely. The curriculum(Junaedi, A. 2020) is prepared with consideration of how graduates can meet predetermined learning outcomes(Gibbon, M. 2002). Graduate learning outcomes at the study program level will then be reduced to course learning outcomes (CPMK).

Alignment between the learning process and learning outcomes (outcome-based teaching and learning) One of the significant things in OBE(Iranata D. 2022) is harmony in choosing the forms and learning methods that will be applied by lecturers and students to achieve the predetermined CPL. Within the OBE framework, the key question is to what extent the chosen learning forms and methods can be effective in fulfilling the CPL. Results-based assessment (outcome-based assessment) 2 Assessment does not only focus on the extent to which students master the course study material. However, it is an assessment and evaluation method carried out to verify CPL fulfillment by students. Data regarding CPL fulfillment will later be used to improve the quality of learning on an ongoing basis (continuous improvement).

2. METHODS

The steps for implementing OBE(Kieren H. McCord, et.al., 2022) within the PDCA (Plan-Do-Check Action) framework are described as follows:

1. Planning

- External conditions: Regulations and guidelines at national and international levels, stakeholder input, external environmental conditions.
- University/Faculty: Vision and Mission.
- Study Program: Preparation of study program educational objectives and graduate learning outcomes (CPL) at the study program level accompanied by performance indicators and curriculum mapping.
- Lecturer: Preparation of RPS which includes Course Learning Outcomes (CPMK), syllabus, learning methods, and outcome-based assessment methods.

2. Implementation that takes into account:

- Learning methods that are aligned with CPL
- Lecture material
- Diversity of learning resources
- Facilities and infrastructure

3. Monitoring and Evaluation carried out:

- Scheduled
- Implement appropriate monitoring and evaluation tools
- Carried out within the scope of universities/faculties, study programs and lecturers.

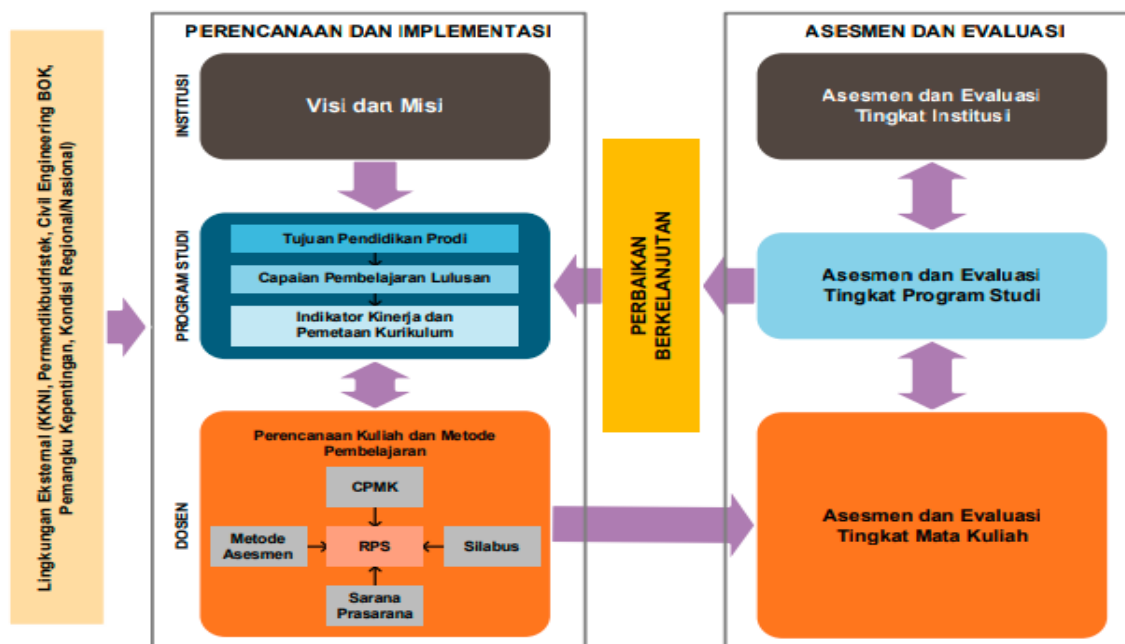


Figure 1. The methods for Comparison of OBE Civil Engineering curriculum

3. RESULTS AND DISCUSSION

3.1. Analisis of Urgensi

Urgency Comparison of learning methods (Krishna and Tulio, 2022) and OBE-based civil engineering curriculum at Putra Malaysia University to develop international collaboration for the Civil Engineering Study Program at Indonesian Education University (UPI) – Universiti

Putra Malaysia. The comparison of the OBE Civil Engineering curriculum – Civil Engineering – UPI – UPM is very helpful in increasing the University's Main Performance Index (IKU) as a tertiary institution that has a reputable international collaboration with the QS 200 University Collaboration (Margaret, 2023) (Mi Pan, et.al., 2022).

The OBE Civil Engineering curriculum really needs international recognition and standard comparisons (Mohammad, et.al., 2016). based on the Washington Accord. The urgency of the Comparison of learning methods and the OBE-based civil engineering curriculum at Putra Malaysia University will increase the experience of International Civil Engineering UPI and UPM in building a mutually beneficial international collaboration (Murlidhar and Shastri, 2016). Implementation of International Cooperation is very necessary to support the Excellence-oriented Accreditation assessment.

The achievement of superior accreditation for the Civil Engineering Study Program must be prepared in accordance with the targets to be achieved before the year of application for accreditation. International collaboration targeted through Comparison of learning methods and OBE-based civil engineering curriculum at Putra Malaysia University is expected to become an embryo in the community development that is being built in the fields of academics, research and community service by the civil engineering study program for the purpose of internationalizing the civil engineering study program through a network of universities abroad, especially those with QS 200. Achievement Comparison of learning methods and OBE-based civil engineering curriculum at Putra Malaysia University is a stage of civil engineering academic development to develop a framework for formulating an OBE curriculum based on international standards..

4.2. Analysis of potential and Chalanges

Currently, the acceleration of the use of technology and the pace of innovation in the production process is growing very quickly, creating a gap between the world of education, the needs of Human Resources (HR) in the world of work, and society. The main challenge in 21st century education is determining roles and strategies to overcome the gap between the educational process in higher education and the needs of the world of work and demands for innovation. One approach used to accommodate 21st century education is Outcome-Based Education (OBE). OBE is education based on Learning Achievements with reference to the study program educational objectives that have been formulated. The OBE principle is the constructive alignment of Learning Outcomes, learning methods, and assessment, which is a continuous development process following the PDCA (Plan-Do-Check-Act) cycle. OBE is an approach that focuses on the continuity of an innovative, interactive and effective learning process.

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3.3. Interactive Discussion of the Civil Engineering OBE Curriculum

Implementation of the Comparison of learning methods and OBE-based civil engineering curriculum at Putra Malaysia University activities began with academic discussion activities. An interactive discussion was carried out by exploring the standard perspective of the Civil Engineering curriculum framework at Universiti Putra Malaysia by identifying the weight of credits or SKS used in UPM Civil Engineering. The application of semester credit weights for the UPM Civil Engineering curriculum is carried out by referring to the standards for implementing the Washington Accord in Malaysia. The curriculum semester credit load in Civil Engineering in Malaysia has quite significant differences with the implementation of OBE in Indonesia. The maximum semester credit load (SKS) applied in Malaysia is very efficient with a credit load (SKS) for civil engineering of 132 credits. This is very different from the credit provisions (SKS) for Civil Engineering in Indonesia of 146 credits. This difference really became the focus of the discussion to take the perspective of learning achievements at UPI Civil Engineering. Many courses at the Indonesian University of Education are inefficient in producing Civil Engineering graduates who comply with KKNi standards. The workload of lecturers is inefficient in producing productive academic and research activities based on OBE. The administrative burden of lecturers in Indonesia does not support the academic and research self-development of lecturers in developing collaboration with the Civil Engineering Industry. The interactive discussion is shown in Figure 2



Figure 2. OBE based curriculum discussion session

3.3. Comparison of OBE Implementation Strategies from a Civil Engineering – UPM Perspective

The application of the UPM Civil Engineering OBE curriculum is very necessary for Civil Engineers to study as a prospective comparison of experience in learning Civil Engineering. The implementation strategy begins with the formulation of an OBE framework which refers to the institution's Vision and Mission which is in accordance with the statutory provisions being achieved. The achievement strategy for Civil Engineering graduates really requires support and orientation to match the institution's vision to the expected goals. The demand for Civil Engineering graduates needed by stakeholders is taken into account in formulating UPM Civil Engineering learning objectives. This is demonstrated by the strategy framework shown in Figure 3.

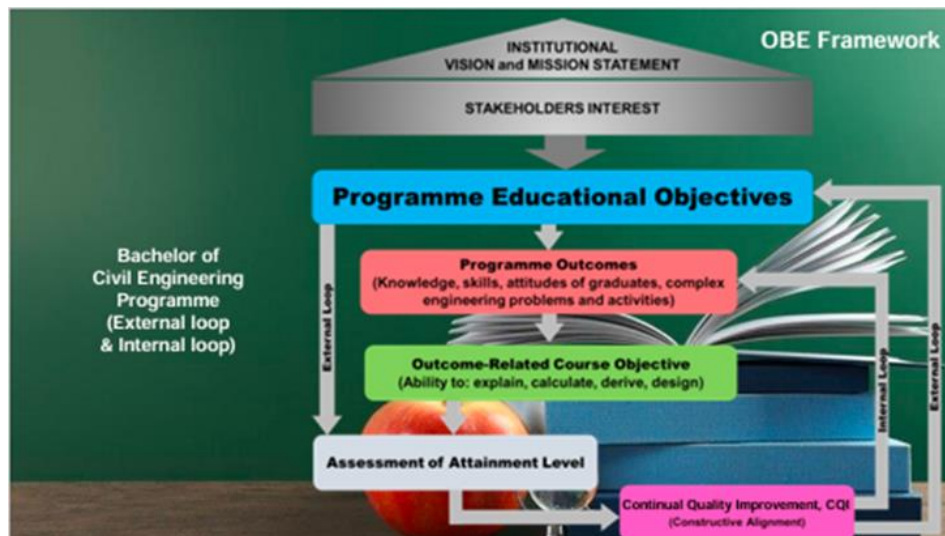


Figure 3. Strategy for implementing the OBE Curriculum

The implementation of UPM Civil Engineering education is oriented towards the benefits that will be achieved in the Civil Engineering education program. Program Outcomes which are defined include the ability to master the knowledge, skills, attitudes of Civil Engineering graduates who are able to face the complexities of the world of the Civil Engineering Industry. The resulting goal of the program is to produce graduates who can explain, calculate and design Civil Engineering needs. The process of producing Civil Engineering graduates goes through an academic learning process and continuous assessment of this process.

3.4. Productive Use of Civil Engineering Laboratories

The Civil Engineering Study Program is a specialist academic education that produces expert graduates in the field of Civil Engineering. The existence of a civil engineering laboratory is very important to support the academic learning process. The benefits of a laboratory begin with the implementation of laboratory operations whose usage standards are in accordance with laboratory accreditation institutions. Comparison of learning methods and OBE-based civil engineering curriculum at Putra Malaysia University activities related to efficient laboratories are demonstrated in field and laboratory discussions. Laboratory useful activities are shown in Figure 4.



Figure 4. Interactive discussion of the benefits of the Civil Engineering Laboratory

3.5. International Collaboration Agreement.

The results of the international collaboration agreement from the Comparison of learning methods and OBE-based civil engineering curriculum at Putra Malaysia University activities were the achievement of an international collaboration agreement in the academic field and the Tri Darma of higher education. The signing of the written agreement was carried out between the heads of the UPI and UPM civil engineering study programs which will be further developed at the Faculty and University level (Figure 6).



Figure 5. MOU on International Civil Engineering Collaboration Agreement UPM – UPI

5. CONCLUSION

International Service Activities with Comparison of learning methods and OBE-based civil engineering curriculum at Putra Malaysia University have very significant benefits in developing institutional and learning infrastructure instruments for higher education institutions in the UPI civil engineering study program. With achievements that support the main performance of PT, namely achieving IKU 6 and IKU 5. The UPI - UPM Civil Engineering Study Program seeks to improve the quality and capacity of institutions with an International Cooperation orientation. International collaboration requires large supporting financing to

achieve good and maximum results. The results of international collaboration of study programs are the foundation for developing the performance of study programs in producing graduates who have superior quality standards. So that financial support for study program implementation activities should be carried out concretely from the study program. Faculty facilitation must be able to support the implementation of study programs well to encourage better IKU college performance

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. The authors confirmed that the paper was free of plagiarism.

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