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Research Article

Feasibility of Independent Oriented Learning Devices Independent Campus Learning (ICL) Study Program (SP) Diploma 3 (D3) Mechanical Engineering Bali State Polytechnic

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Abstract.
The Independent Campus Learning (ICL) Policy is one of the policy studies the government is currently promoting to implement in universities. Implementing this policy in educational programs requires readiness in the study program. Having appropriate learning tools demonstrates this readiness and adherence to the ICL curriculum. In adherence to this policy, the D3 Engineering Study Program (SP) at Bali State Polytechnic (BSP) developed learning tools aligned with the ICL Curriculum. The objective of this study is to assess the feasibility of learning materials, including Semester Learning Plans (SLP) and textbooks oriented to the ICL curriculum in the D3 Mechanical Engineering study program. The developers employed a research and development approach, utilizing the Borg & Gall model modified into three development stages: preliminary studies, product design, and development and evaluation. The assessment of experts is used to review the feasibility aspect. The feasibility test involved three experts: content, media, and practitioners. Results indicate that the feasibility of Semester Learning Plans (SLP) and textbooks reached 87.5%, with 84.6% categorized as very feasible and appropriate. The Semester Learning Plans (SLP) and textbooks are straightforward and suitable for implementing the ICL curriculum in the BSP's D3 Mechanical Engineering study program. Nonetheless, minor revisions are required. The implication is that after revision, Prototype I can proceed to the next development stage, involving practicality and testing product effectiveness.

Keywords: independent campus learning, curriculum, learning devices, feasibility

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1. Introduction

The government and universities carry out various policies and studies to obtain the relevance of teaching, training, and education in tertiary institutions. The study of these policies certainly pays attention to the development of science and the demands of the world of work, as well as campus life related to socio-culture in the life of society and the

state [1]. In addition, the government is also trying to reduce the national unemployment rate by synchronizing education with the world of work and industry so that university graduates are ready to work with their areas of expertise and the needs of the world of work [2]. The Ministry of Education and Culture is trying to do this by launching a new Independent Campus Learning policy.

The Minister of Education and Culture launched the Independent Learning - Independent Campus policy through the Minister of Education and Culture Regulation Number 3 of 2020 concerning National Higher Education Standards on Learning Process Standards, especially in subsections 15 and 18. ICL is one of the policy studies that the government is currently promoting to be applied to higher education. ICL is an independent and versatile higher education learning model designed to create a creative learning community without limiting student needs [3]. The ICL program is an educational revolution based on the development of Industry 4.0 [4]. The aim is to encourage students to gain learning experience with additional competencies in study programs and/or off campus [5]. Apart from that, it is also to create competitive human beings, namely healthy, intelligent, adaptive, creative, innovative, skilled, dignified, productive, and with character following the values of Pancasila [6]. Operationally, ICL aims to improve the competence of graduates, both soft skills and hard skills, so that they are more prepared and relevant to the needs of the times, as well as preparing graduates to become future leaders of the nation who are superior and have personality. The ICL policy encourages students to understand various valuable knowledge for entering the world of work. ICL allows students to choose the courses they want to take. This concept is a continuation of the concept of independent learning in universities. The readiness of each Study Program is needed to deal with the changes brought about by the ICL policy. The existence of appropriate learning tools shows this readiness and following the ICL curriculum. Learning objectives reach the target well, and it is necessary to have learning tools following the learning methods and strategies used [7].

Learning devices are a form of preparation made by an educator before they carry out the learning process [8]. In detail, learning tools are some materials, tools, media, instructions, and guidelines that will be used in the learning process [9]. Learning tools are signs for a lecturer to carry out class activities. Specifically, its function is as a learning guide for lecturers, as a benchmark for learning success in class, as a medium to increase lecturer professionalism, and a tool to make it easier for lecturers to facilitate learning [10]. Its primary function is to serve as evaluation material for lecturers to determine how far the delivered competency standards have been achieved. The complete form of learning tools includes concept maps, course syllabi, Semester Learning Plans (SLP),

Learning Process Plans (LPP), Student Assignments (SA), Student Worksheets (SW), and learning outcomes assessment sheets. In the Regulation of the Minister of Research, Technology, and Higher Education number 3 of 2020, it is explained that the Semester Learning Plan (SLP) is a learning planning document prepared as a guide for students in carrying out lecture activities for one semester to achieve predetermined learning outcomes [11]. The formulation of SLP refers to the description of learning outcomes that have been defined in the curriculum

In order to implement the current ICL curriculum in the D3 Mechanical Engineering study program at the Bali State Polytechnic, there are no learning tools based on the ICL curriculum. The available learning tools, such as syllabi, lesson plans, teaching materials, and assessments, refer to the previous curriculum, namely the 2017 Higher Education Curriculum (HEC), based only on the Indonesian National Qualifications Framework (INQF). Meanwhile, ICL, besides being based on INQF, is also oriented towards Outcome Based Education (OBE). OBE focuses on learning outcomes: knowledge, skills, and attitudes mastered by students based on the results of identifying and formulating graduate learning outcomes.

Learning is the process of student interaction with lecturers and learning resources in a learning environment. The actual form of lecturer preparation is making learning tools before learning activities. Learning devices are used as guidelines to achieve learning objectives. These guidelines are referred to as “guidelines and a common understanding” [12]. The organizers must emphasize providing students with space for learning activities [13]. Learning tools that will be developed are semester learning plans (SLP) and textbooks

The SLP is a one-semester learning plan for a particular subject and is a program that still needs to be elaborated. SLP is a standard part of the learning planning process, containing activities or actions to coordinate learning components so that learning outcomes, learning materials, delivery methods, activities (methods, models, techniques), and how to assess them become clear and systematic so that the learning process for one semester becomes effective and efficient. The SLP is structured systematically and systemically and is oriented towards learning outcomes. SLP is developed by lecturers independently or together in a group of science and/or technology experts in one study program.

Textbooks are teaching materials arranged systematically, displaying the competencies students will master in their learning process [14]. Textbooks are a reading source that is quite often used in the world of education. Not only in school education but also in higher education. Students and lecturers use textbooks as support for studying material.

Textbooks significantly influence students in absorbing information and knowledge related to the field of science being studied. Textbooks need to be adapted to students' conditions and the learning strategies used by lecturers.

The quality of products resulting from research and development plays a role in increasing learning effectiveness. Because the results of research products play an essential role in education [15]. To fulfill this function, the product must meet good criteria. Learning tools developed are said to be highly quality if they meet the criteria of validity, practicality, and effectiveness [15]. A learning device is valid and practical if the device is easy and can be implemented. It is effective if the learning objectives can be achieved using the developed learning device. A learning device is valid with a feasibility index (V) $\geq$ 70%. The feasibility index is calculated using the formula feasibility = (Total validation score/Maximum score) x 100% [16]. This study aims to determine the level of validity of learning devices in the form of Semester Learning Plans (SLP) and ICL PS D3 Mechanical Engineering-oriented textbooks.

2. Method

This research is classified as development research, using the Borg & Gall model carried out in 10 development steps, namely: preliminary research and information collection, planning, development of the preliminary form of product, preliminary field testing, primary product revision, main field testing, operational product revision, operational field testing, final product revision, dissemination, and implementation. Implemented at the Bali State Polytechnic, the subjects were students and lecturers in the D3 Mechanical Engineering Study Program.

Preliminary studies and information gathering include conducting an initial survey to inventory lecturers' needs regarding learning tools in the form of SLP and ICL curriculum-oriented textbooks and formulating prototypes of SLP and textbooks. The second stage is the design or planning stage, which includes reviewing the guidelines for developing the Independent Campus Learning Curriculum according to Number 3 of 2020 concerning National Higher Education Standards and format selection. Initial product development stage (prototype I): constructing learning tools, testing instruments for product testing, and validating the product through expert appraisal. The Revision Stage is carried out by analyzing the trial results, taking inventory of inputs and deficiencies, conducting FGD (Focus Group Discussion), and product improvement based on the trial analysis and input (Draft II). The field test stage is the small-scale trial stage to determine the practicality of lesson plans and textbooks (prototype II) [15,17]. Product revision stage

and wide-scale field trial stage (prototype III) to determine effectiveness. Revision for the final product is carried out in the next stage. It has only been carried out up to the validity testing stage through theoretical testing.

Feasibility data was collected using a validation questionnaire. The feasibility test involves content experts, media experts, and practitioners. The measurement aspects for textbooks include the appropriateness of content, presentation, language, and graphics [18,19]. Criteria for interpretation of validation results by experts and practitioners, using percentage intervals: 85.01% < V ≤ 100% very feasible but needs minor revision; 70.01% < V ≤ 85.00% feasible, usable but needs minor revision; 50.01% < V ≤ 70.00% not feasible, can be used but needs significant revision; and 0.01% < V ≤ 50.00% is not feasible, should not be used [16].

3. Result and Discussion

3.1. Results

The recapitulation of the assessment results by each validator is presented in Table 1.

3.2. Discussion

Preliminary studies and information collection were carried out by analyzing problems related to the learning tools used by lecturers at the D3 Mechanical Engineering Study Program. The analysis was carried out using a document study, namely analyzing the content of the SLP and textbooks being used. The analysis results show that the SLP and textbooks used by lecturers do not entirely refer to Minister of Education and Culture Regulation No. 3 of 2020 concerning ICL. The formulation of graduate learning outcomes (GLO), especially aspects of attitudes and skills, is generally incomplete. The SLP has not stated the GLO matrix with Course Learning Outcomes (CLO). The learning activities prepared by the lecturer in the learning tool emphasize the teacher center, where the lecturer is more active in explaining the concepts of the material being studied during the learning process. The textbooks used are handouts developed by lecturers; their validity, practicality, depth of material, and effectiveness are unknown.

The SLP components implemented by lecturers in charge of theoretical and practical courses are not yet complete, student learning experiences have not been found, which are manifested in descriptions of assignments that students must carry out during one semester, and the learning methods used have not varied, only discussions and

Table 1: SLP Feasibility Test Results.

No	Aspects Studied	Score	Percent (%)
	Content Expert (V1)		
1	SLP format.	5	
2	Identity.	5	
3	Course description.	4	
4	Glo.	5	
5	Made every meeting (Sunday to...).	5	
6	Expected final capability (Sub - CLO).	4	
7	Study materials.	4	
8	Forms of learning: methods and student tasks.	4	
9	Time provided.	4	
10	Assessment: criteria, and indicators.	4	
11	Assessment weight.	4	
12	Learning materials.	4	
	Total score	52	86.7
	Media Expert (V2)		
1	Conformity of the SLP design with the specified GLO.	5	
2	The content of the SLP is a reflection of the GLO target imposed on the course on the SLP content.	5	
3	Learning is designed to be student-centered.	5	
4	Learning activities can develop competence in students.	4	
5	The suitability of the learning steps with the selected, defined learning strategy, approach, or models used.	4	
6	Learning activities consist of context, learning experience, and evaluation.	5	
7	The selection of time allocation is based on the availability per semester.	4	
8	Adequate sources of learning or reference materials.	4	
9	Accuracy in selecting types of media and or learning resources.	4	
10	Suitability between the chosen learning media with the strategy or approach or learning model and/or types of learning activities and indicators of GLO achievement.	4	
11	The accuracy of the selection of techniques and the form of assessment instruments.	5	
	Total score	49	89.1
	Practitioner (V3)		
1	Compatibility with the syllabus.	5	
2	Adequacy and clarity of SLP identity (Department, Study Program, subject code, class/semester, primary material, time allocation).	5	
3	Formulating learning objectives uses ABCD (Audience, Behavior, Condition, and Degree) or CABD (Condition, Audience, Behavior, and Degree).	4	
4	Conformity of the formulation of learning outcomes with Competency Achievement Indicators.	4	
5	Depth of subject matter.	4	

lectures. Learning methods for both theoretical and practical lectures should use varied

Table 1: Continued.

No	Aspects Studied	Score	Percent (%)
	Practitioner (V3)		
6	Accuracy of subject matter.	5	
7	The suitability of the learning steps with the selected or defined learning strategy, approach, and model use.	4	
8	The sequence of learning steps.	4	
9	Adequate time allocation for each learning stage.	4	
10	Adequate sources of learning or reference materials.	4	
11	The accuracy of selecting the types of media and or learning or learning resources.	4	
12	Conformity between the chosen learning media with the learning strategy/approach/model and/or types of learning activities and indicators of achievement of Learning Outcomes.	5	
13	Accuracy of selection of assessment techniques.	5	
14	Accuracy in selecting the form and type of assessment instruments.	4	
15	Conformity between information and communication technology (ICT) is used with learning strategies, approaches, models, GLO achievement indicators, and student characteristics.	5	
16	Comprehensive achievement of the three domains of student abilities (attitudes, skills, and knowledge).	4	
17	Learning steps include the development of higher-order thinking abilities (HOTS).	4	
18	The formulation of learning steps includes student character development.	4	
	Total score	78	86.7
	Average percentage (%)		86.6
	Category		Very feasible

learning methods according to the demands of the ICL curriculum learning outcomes. The implemented SLP has not found complete harmony between GLO, CLO, and SUB-CLO. GLO is Expected Learning Outcomes (ELO), which are general and determined by the Study Program. The formulation of the GLO must refer to the provisions of the Graduate Competency Standards (GCS) contained in Minister of Education and Culture Regulation Number 3 of 2020 concerning National Higher Education Standards. GCS is a minimum criterion regarding the qualifications of graduate abilities, including attitudes, knowledge, and skills stated in the formulation of graduate learning outcomes. GLO or Course Learning Outcomes (CLO) are specific according to the focus of the course study. The final abilities planned in each learning stage are SUB - CLO or Lesson Learning Outcomes (LLO). Therefore, the ICL-oriented lesson plans and textbooks are reconstructed with the expectation that the learning outcomes and indicators that have been determined will be achieved.

TABLE 2: Textbook Feasibility Test Results.

No	Aspect	Score		Average score	Category
		B1	B2		
	Content Expert (V1)				
1	Self instruction.	4	4	4	
2	Self contained.	4	5	4.5	
3	Stand alone.	4	5	4.5	
4	Adaptive.	4	4	4	
5	User friendly.	5	4	4.5	
	Amount	21	22	21.5	
	Percentage (%)	84.0	88.0	86.0	Very feasible
	Media Expert (V2)				
1	Cover Design.	5	5	5	
2	Textbook cover layout.	4	4	4	
3	Textbook cover typography	4	4	4	
4	Textbook cover illustration.	4	5	4.5	
5	Layout of textbook contents	4	4	4	
6	Textbook content typography.	3	4	3.5	
7	Illustration of textbook contents.	4	4	4	
	Amount	28	30	29	
	Percentage (%)	80.0	85.7	82.9	Feasible
	Practitioner (V3)				
1	Appearance.	4	4	4	
2	Preface.	4	4	4	
3	Learning indicators.	4	4	4	
4	Contents of the textbook.	4	4	4	
5	Summary.	5	5	5	
6	Test.	3	3	3	
7	Answer key.	5	5	5	
8	Feedback.	5	5	5	
	Amount	34	34	34	
	Percentage (%)	85.0	85.0	85.0	Feasible
	Average percentage (%)			84.6	Feasible

TABLE 3: Recapitulation of Learning Device Feasibility Test Results.

No	Device Type	Expert			Average percentage (%)	Category
		Content (V1)	Media (V2)	Practitioner (V3)		
1	SLP	86.7	89.1	86.7	87.5	Very feasible
2	Textbook	86.0	82.9	85.0	84.6	Feasible

Based on preliminary studies and information gathering, SLPs and textbooks are adjusted to the learning outcomes set in the ICL. SLP was designed with the OBE approach. The OBE approach encourages students to be active, able to analyze, think critically, and exchange ideas in learning. The format for preparing the SLP is modified according to the National Higher Education Standards. The SLP must contain at least: (a) name of study program, name and code of course, semester, credits, name of the teaching lecturer; (b) graduate learning outcomes assigned to courses; (c) final capabilities planned at each learning stage to meet graduate learning outcomes; (d) study materials related to the abilities to be achieved; (e) learning methods; (f) the time provided to achieve abilities at each learning stage; (g) student learning experiences which are manifested in descriptions of assignments that students must carry out during one semester; (h) criteria, indicators and assessment weights; and (i) list of references used [11]. Meanwhile, ICL-oriented textbooks are teaching materials developed by combining traditional sources with electronic or digital materials that can be accessed online.

Textbooks are prepared and developed based on the learning outcomes that students are expected to master. These learning outcomes include material or content standards (content standards) and achievement standards (performance standards). Material standards contain the type, depth, and scope of lecture material that students must master, while performance standards contain the level of mastery that students must display. Using textbooks following learning outcomes allows students to study a course achievement in a coherent, systematic, innovative manner so that all competencies are expected to be achieved as a whole and integrated [20,21]. These teaching materials in the form of printed materials were developed by paying attention to the structure, content, and online resources that are integrated into printed learning materials. The structure consists of the main topic, objectives of studying the material, description of the material, sub-topics, exercises, summary of the material, formative tests, and a glossary and reading material. The selection of material is based on the principles of relevance, consistency, and adequacy [16,22,23]. Depth refers to the aspects contained in learning outcomes, course learning outcomes, and learning sub-achievements, while the order is based on a hierarchical approach [19,22]. The delivery approach uses problem-based learning. Learning evaluation uses a form of test packaged in a competency test at the end of each sub-chapter and chapter.

The initial draft of SLP and textbooks that have been constructed are referred to as prototype I. The SLP prototype was developed referring to the format recommended in Minister of Education and Culture Regulation Number 3 of 2020 concerning National

Higher Education Standards. ICL-oriented textbook prototype refers to the 2014 INQF curriculum, structure: Introduction page, Nas page (body of the book), and Ending page. The introductory page consists of a title page, table of contents, list of figures, list of tables, introduction, foreword, and discourse. The Nas page (body) contains detailed descriptions of each chapter, sub-chapters accompanied by examples, and practice questions. At the end of each chapter, a summary is given to make it easier for readers to remember essential things. Prototype I was then theoretically validated by three validators to get draft II. Expert validation involves experts: 1) content (V1), 2) media (V2), and 3) practitioners (V3) [16,17]. Practitioners from senior teaching staff or colleagues in the field of engineering

The average percentage of assessment scores validators gave for SLP reached 87.5% in the very feasible category. This means the SLP being developed follows the SLP components in Minister of Education and Culture Regulation Number 3 of 2020. The learning activities in the SLP being developed follow the learning method steps that have been chosen. The average score given by validators for the developed textbooks reached 84.6%, which is in the feasible category. This means that the textbooks developed are following the National Textbook Standards.

Some input from validators is related to SLP, namely that the CLO formulation is more operationalized according to the desired skill level. Meanwhile, for textbooks, the practice questions at the end of each textbook chapter are more focused on training high-level thinking, communication, and problem-solving skills.

Considering the input and suggestions provided by each validator, prototype I was revised, and the result became prototype II, and then a practicality test was carried out. Practicality is based on the responses of lecturers and students [15]. The practicality test of SLP is based on the implementation of learning and practicality. Meanwhile, testing the practicality of textbooks based on lecturer and student responses consists of several aspects: attractiveness, development process, ease of use, usefulness, and relevance. At the same time, the responses from students consisted of aspects: attractiveness, ease of use, and product benefits. Practicality tests on students are carried out through small group tests, extensive group tests, and limited trials. Practicality testing will be carried out at the next development stage in the D3 Mechanical Engineering Study Program, BSP.

4. Conclusion

The feasibility of SLP and textbooks reached 87.5%, and 84.6% were categorized as very feasible and appropriate. The SLP and Textbooks are straightforward and appropriate to implement the ICL curriculum in the BSP's D3 Mechanical Engineering study program. However, minor revisions need to be made. The implication is that prototype I, after revision, can be continued to the next development stage, namely practicality and product effectiveness testing.

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