



Needs Analysis of Project Based Learning (PjBL) Teaching Materials on Engineering Materials and Evaluation Procedures

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Abstract. This study aims to determine the analysis of the needs for teaching materials based on Project based Learning (PjBL) on technical materials and learning evaluation procedures, in the Civics Study Program. The concept of Project Based Learning is a learning method that uses project design, development, and completion as the core of learning. The research method that will be used is descriptive quantitative. The subjects in this study were 46 students who took lesson planning courses. Sampling is also done with the saturated sample technique, which means that all students will be involved in this study. Data analysis was taken through documentation techniques and questionnaires distributed to students. The results of the research through this questionnaire were obtained that: a) The results of the analysis of material needs that the planning course contained several types of material in its content ranging from abstract, concept and concrete. In the technical material and evaluation procedures, it was found that there were still 30% abstract concepts including the concept of Civics learning planning, the principles of Civic Education learning planning, the theoretical basis of learning planning, 20% of the concepts showed the process including learning planning models, syllabus and those using the Learning Method Model. And 50% concrete concepts, the concept of developing teaching materials and teaching materials, the concept of developing learning media, types of learning media, the accuracy of determining learning media, learning strategies, student center-based learning methods, the concept of developing LKPD. While the concrete concept includes the material of the concept of learning evaluation, assessment of the cognitive, affective and psychomotor domains, so that this concrete concept can be implemented through Project based learning (PjBL); b) Analysis of student needs shows that 85.3% need to develop project-based learning (PjBL)-based teaching materials so that student learning experiences are meaningful. Analysis of lecturer needs is also 100% of lecturers expressed interest and will develop PjBL-based teaching materials in learning.

Keywords: Teaching Materials · PjBL and Learning Planning

1 Introduction

Education is one of the foundations of character building for the nation's next generation to continue to be developed with the current developments, especially in the field of technological development that must be fulfilled, therefore the education system applied in schools must be able to generate abilities and skills from students. Consider education as an important sector that can influence a nation and then serve as a means to improve the quality of the nation itself [1]. This is in line with Law no. 20 of 2003 concerning the National Education System one of the goals of national education is to develop the capabilities and character and civilization of a dignified nation in order to educate the nation's life [2].

Formal educational institutions that aim to form human personalities who are able to provide the knowledge, skills and abilities needed by students are schools. In this case, it is explained based on Law No. 20 of 2003 concerning the National Education System which defines education as a conscious and planned effort to create a learning atmosphere and teaching and learning process so that students can develop their own potential. From this definition, it is expected that learning should be centered on students (student center learning), in which student center learning is a learning that encourages students to be directly and actively involved in the learning process to develop the potential of these students.

However, the facts in the field are still found that in the learning process in the classroom the teacher still uses the conventional lecture and discussion method in class so that learning becomes less meaningful and students have not been given the opportunity to develop their potential. In this case, the teacher must be able to package learning that involves the learning experience of students and both of them participate in the learning process. Learning experiences that involve students directly will make a fun learning activity and can provide independence for the students themselves.

This is in line with the concept of Project Based Learning (PjBL), which is a learning method that uses a design, development, and project completion as the core of learning. Which through Project Based Learning (PjBL) can involve students in problem solving activities, as well as provide opportunities to construct teaching and learning. PjBL has a positive effect on students' knowledge and development of skills such as collaboration, critical thinking, and problem solving [3].

One of them is the provision of teaching materials in the classroom. Teaching materials are an important thing, needed in learning and have been adapted to the core and learning competencies. Teaching materials contain learning materials, methods, methods, limitations and ways of evaluating which are designed systematically and attractively in achieving the expected goals, achieving competencies or sub-competencies with all their complexity [4]. Supriyono's opinion is in line with that stated that teaching materials are all materials, both information, tools or texts that are arranged systematically and fully display the competencies possessed by students to be used in learning with the aim of planning and studying the implementation of learning [5]. Teaching materials according to the National Center for Competency Based Training are all forms of things that are used in the learning process to help educators in the learning process in the classroom [6]. In this case, teaching materials can be written or unwritten. Meanwhile, teaching materials are part of the learning component [7]. The content and material that

will be delivered and studied by students is delivered through teaching materials. Educators need to have skills in designing and developing quality teaching materials. From the above understanding, it can be concluded that the existence of teaching materials in the learning process is very important. Because teaching materials that have been systematically arranged can facilitate the delivery of information and what competencies must be mastered by students.

The needs analysis is carried out in the lesson planning course which contains a lot of practical material and collaboration between students. Therefore the PjBL learning model is very suitable to be applied because by using the PjBL learning model learning seems to be more active in completing practical material. In this case, the educator acts as a facilitator and the students will take the initiative in completing the task. At the end of the lesson, the teacher will be evaluated to correct the work of students based on the learning model that has been carried out.

Such as the research that has been conducted by with the title Development of History Writing Teaching Materials Based on the Project-Based Learning Model [8]. With the aim of research to produce teaching materials for historical writing, which is carried out using the Project-based learning model, it includes: project determination, project completion steps design, schedule preparation, completion, report preparation, and project result evaluation. The results of the study indicate that the teaching materials used in historical writing based on project-based learning are said to be valid and feasible to use. These teaching materials can help students to be better able to understand and apply the concepts seen in the learning process and results obtained. In line with this research, research conducted that the development of teaching materials was intended to improve students' understanding and facilitate the learning process both at school and at home [9]. Therefore, based on the description above, the need for PjBl-based teaching materials on learning evaluation procedures and techniques in order to involve active participation of students.

2 Methods

This research method is research and development (RnD) which ultimately produces a product and tests the level of product effectiveness [10]. However, in this study using the theory of which became 3 research steps [11]. The first step is conducting preliminary studies and theoretical studies; the second stage of product development; and thirdly testing the product. The research focuses on the first step of preliminary studies and theoretical studies. The type of research used is survey research. This type of research is part of Research and Development (R&D) research. The subjects of this research are first semester students in the 2021/2022 academic year who are taking Civics courses. The students who were used as research samples were 46 students. The sampling technique used random sampling. The research activity was carried out at Sriwijaya University, South Sumatra. The data collection technique used is filling out questionnaires and documentation. The data analysis process is carried out descriptively by describing the results of the questionnaire in a diagram that describes the results of the questionnaire. Documentation data is also described descriptively.

3 Results and discussion

3.1 Material Needs Analysis

Literature study of the RPS Learning Planning of the Unsri PPKn Study Program was carried out to examine the Achievement of Graduates and concept analysis was carried out by examining the existing Learning Implementation Plans. The concept of the material discussed is In the technical material and evaluation procedures it is found that there are still 30% abstract concepts including the concept of Civics learning planning, the principle of PPKn learning planning, the theoretical basis of learning planning, 20% of the concepts show the process includes learning planning models, syllabus and lesson plans which uses the Learning Method Model and 50% concrete concepts, the concept of developing teaching materials and teaching materials, the concept of developing learning media, types of learning media, the accuracy of determining learning media, learning strategies, learning methods, based on student center, the concept of developing worksheets Learners. While the concrete concept includes the concept of learning evaluation concepts, assessment of the cognitive, affective and psychomotor domains, so that this concrete concept can be implemented through Project based learning (PjBL) [12].

3.2 Student Needs Analysis

The next stage is the analysis of student needs on the use of media in the learning process. At this stage, an initial analysis was carried out, namely by distributing questionnaires using google forms in the form of links to find out the state of the class, the learning facilities of lecturers and students and the need for learning to use interactive media based on articulate storylines as an effort to increase student learning motivation in the Lesson Planning course. Researchers conducted field studies to find out the need for the development of PjBL-based teaching materials as an effort for student participation in real activities at the end of each meeting in the course (Table 1).

Based on the results of the analysis of materials and needs, it is clear that the importance of developing PjBL-based teaching materials for students in lesson planning courses, so that they can help in mastering the material and increase student learning motivation. This is in accordance with the opinion of experts that students are encouraged to be more actively involved in learning materials and develop critical thinking skills, so that students practice conducting investigations and inquiries. Project Based Learning is an instructional method that encourages learners to apply critical thinking, problem solving skills, and content knowledge to real world problems and issues [13, 14]. Project Based Learning is a learning method that encourages students to apply critical thinking, problem solving skills, and gain knowledge about the real problems and issues they face. In this Project based learning, educators will play a more role as facilitators who guide students through the learning process. With real involvement, students are actively involved and learning is meaningful.

3.3 Analysis of Lecturer Needs

The study of the analysis of the needs of lecturers in this preliminary study stage research was conducted by giving questionnaires to the lecturers of the subject, totaling 2 people.

Table 1. Analysis of Student Needs

No	Statement	Answer	Percentage
1.	All students hope that learning is packaged in a more meaningful learning method	Yes	100%
2.	Student will more easily understand the concept of the material if it is associated with various projects	Yes	85%
3.	Lack of project based teaching materials makes learning interest low	Yes	75%
4.	Interesting teaching materials will be more meaningful if done in groups	Yes	90%
5.	The project based approach will train the implementation of theory into real learning	Yes	85.3%
6.	Project-based teaching materials are developed according to the needs of today's students	Yes	95%

Sampling was taken with a saturated sample technique. Based on the results of the questionnaire given to the lecturers in the course, it was found that 75% of the lecturers hoped that the transition from online to offline would invite students to be involved in meaningful and participatory learning. This is also aimed at the Planning course where the availability of project-based teaching materials is obtained by 85% saying that students must be able to solve problems and actualize knowledge in everyday life in groups. The reason is because the lecturer's ability to deliver theory will be easier because learning can be done independently. The limited time to deliver the material by providing examples of real assignments obtained 55% results so that teaching materials are needed that will facilitate students, 100% of powerful lecturers agree that the development of project-based teaching materials is carried out to achieve hot learning goals and indeed the material in the planning course is dominant in the material concrete that can be practiced directly by students.

This is in line with the principle that in the PjBL model students not only understand the content, but also develop skills in students how to play a role in society. Skills developed in PjBl include communication and presentation skills, organizational and time management skills, research and investigation skills, self-assessment and reflection skills, group participation and leadership, and critical thinking [15].

In addition, the advantages of implementing the project based learning model are: "(1) increasing students' motivation to learn to encourage their ability to do important work, and they need to be appreciated; (2) improve problem solving ability; (3) making students more active and successful in solving complex problems; (4) enhance collaboration: (5) encourage students to develop and practice communication skills; (6) improve students' skills in managing resources; (7) providing students with learning and practical experience in organizing projects and making allocations of time and other resources such as equipment to complete assignments; (8) provide a learning experience that involves students in a complex and designed to develop according to the real world;

(9) involving students to learn to take information and demonstrate their knowledge, then implement it in the real world; (10) make the learning atmosphere fun, so that students and educators enjoy the learning process” [16].

PjBL learning model students plan a project about something, they become very involved in it. And, when they complete the project well, the students will get satisfaction. This is much more motivating than giving rewards from the teacher, although of course this happens simultaneously. Intrinsic motivation is very important. In theory, when students get satisfaction because of a success, their motivation to learn in the next activity will also be better [17, 18].

One of them is PjBL-based learning tools can also improve student understanding. Teachers and learning tools play an important role in students’ understanding. This PjBL learning tool improves students’ ability to solve science problems in everyday life [19, 20].

Good teaching materials can encourage successful learning and increase the effectiveness of learning itself. So the ability to write teaching materials for a teacher is an absolute must. Mastery of teaching materials makes it easier for teachers to achieve learning objectives. Teachers are not only required to be skilled in mastering teaching materials, but more than that teachers are expected to have the skills to write teaching materials. Not a few found the lack of ability of teachers in presenting teaching materials in class effectively and fun, supported by the lack of skills of teachers in packaging teaching materials independently. The teaching materials that have been displayed by teachers in class are generally obtained from textbooks that have been provided by the government or from various publishers so that sometimes they are not in accordance with the learning needs of students at school. This is because each school has a different culture and characteristics [21, 22].

Of course this is in line. The challenges that must be faced in learning in the 21st century in higher education are to deliver students so that they have the ability to: think critically and be problem-solving oriented, work collaboratively with network schemes, easily adapt to the social and academic environment, build initiatives and entrepreneurship, effective oral thought delivery and written communication, access and analysis of information and developing imagination.

This is in accordance with the understanding that every individual must have 21st century skills such as asking questions, creative thinking, critical thinking, strong personality, decision making and problem solving in order to be able to choose among the information they receive, interpret information and generate new knowledge and be able to communicate well in society Educating individuals with these skills requires careful planning. In order for the development of student abilities to be carried out more directed and in accordance with the needs and challenges of the times, the development of student abilities must be carried out programmatically through the curriculum that will be studied by students. The curriculum needs to be modified in line with these demands, with the aim of equipping individuals to have 21st century skills [23–25].

4 Conclusion

The development of jar materials based on Project Based Learning (PjBL) shows that the results of both material needs analysis, analysis of student and lecturer needs are the

guidelines for the implementation of this research. The results of the research through this questionnaire were obtained that: a) The results of the analysis of material needs that the planning course contained several types of material in its content ranging from abstract, concept and concrete. In the technical material and evaluation procedures, it was found that there are still 30% abstract concepts including the concept of Civics learning planning, the principles of PPKn learning planning, the theoretical basis of Civics learning planning, 20% of the concepts show the process includes models of Civics learning planning, syllabus and lesson plans that use the Model Civics Learning Methods and 50% concrete concepts, Concepts of developing teaching materials and teaching materials for Civics, Concepts of developing learning media, types of learning media, accuracy in determining learning media, Civics learning strategies, Student Center-based Civics Learning Methods, Concept of developing LKPD. While the concrete concept includes the material of the concept of learning evaluation, assessment of the cognitive, affective and psychomotor domains, so that this concrete concept can be implemented through Project based learning (PjBL); b) Analysis of student needs shows that 85.3% need to develop project-based learning (PjBL)-based teaching materials so that student learning experiences are meaningful. Analysis of the needs of lecturers also 100% of lecturers stated that they were interested and wanted to use the schoology-based mobile learning in the learning process.

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