

Potential Impacts of the Development of Textbook of Population and Environmental Education Subjects Based on Problem-Based Learning for Civics Education Study Program

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ABSTRACT

The objective of this study was to analyse the potential impact potential impacts of the development of the textbook of Population and Environmental education subjects based on problem-based learning for the Civics education study program in improving students' critical thinking skills. The textbook was developed to improve the critical thinking attitudes of the students. The potential impacts of the development of the textbook were analyzed from students' enthusiasm during the teaching-learning process and the scores obtained in solving problems. The data of the study were gathered from tests and observations. The results of the tests showed that there was a significant improvement in students' scores after using the developed textbook. The average score of the pre-test was 65 and the average post-test score was 90. Furthermore, the results of the observations indicated that students' positive attitudes toward the lecturer during the learning process reached a value of 81.5%, which was categorized as good. Based on the results, it can be concluded that the developed textbook had potential impacts in improving students' critical thinking.

Keywords: *Textbook, Population, Environmental education, Problem-based Learning.*

1. INTRODUCTION

Humans are unique creatures that can manipulate nature to survive. Unlike other creatures, such as dinosaurs, which cannot adapt and thus eventually become extinct by itself, humans are endowed with minds by God so that they can survive in the natural evolutionary process. The uniqueness makes humans continuously manage nature and even exploits nature excessively.

Statistical data shows that 1.49 million hectares of forests in Indonesia are burnt every year. This shows that human actions in exploiting nature on a large scale from time to time have caused irreparable damages to the environment. Also, the population of Indonesia, which has reached more than 260 million people, will certainly cause new problems for the benefit of mankind unless it is controlled and managed properly.

With such conditions, a holistic effort is needed related to efforts to save natural ecosystems. One of them is through education. Education is a conscious effort to change a generation, whose results cannot be seen in a short time. According to the Act of the Republic of Indonesia on National Education System No.3 of 2003 concerning the National Education System, education means conscious and well-planned effort in creating a learning environment and learning process so that learners will be able to develop their full potential for acquiring spiritual and religious strengths, develop self-control, personality, intelligence, morals, and noble character and skills that one needs for him/herself, for the community, for the nation, and the State.

One of the efforts which can be done to preserve the environment through education is developing Population and Environmental Education course. The course aims to provide knowledge to students about the

population and the environment. Of course, the course will not change the situation immediately but will provide knowledge to be provisions for students to participate in preserving the environment in the future.

Population and Environmental Education (PEE) refers to a course of Civics Education Study Program of Faculty of Teacher Training and Education of Sriwijaya University included in the Work Expertise Course group (i.e. study and learning which aim to produce experts with work based on knowledge and skills mastered). For this reason, in PEE learning, students are equipped with the competence to study essential concepts of population and the environment. The basic materials discussed in this course include several concepts of population, demography, environment, natural resources, Environmental Impact Analysis, and global environmental issues (Syllabus of PEE Course of Civic Education of Sriwijaya University, 2020).

As a subject included in the social science group, this course is rich in content from various sources, confusing students in learning because of its very broad material coverage. Therefore, an integrated learning media or teaching materials are needed to be a reference in the learning process. Conceptual understanding was one of cognitive aspect which ensure success rate of students. If conceptual understanding of students was good, students would be successful in following the course [1].

Learning is a process of interaction among educators, students, and learning resources in a learning environment to help students learn well. Therefore, the learning process is very important to achieve the desired learning goals. One of the obstacles faced in learning PEE courses in the absence of standard teaching materials to be used as a reference in the learning process. This causes students to still look for teaching materials to be used in learning on each learning topic independently.

One important aspect of the learning process is the availability of learning resources as they can be beneficial for enriching students' reading sources in certain subjects. One of the teaching resources which can be developed is textbooks. Textbooks can be made by lecturers to be used in the classroom to make students understand the materials easier. Teaching materials can be developed through the developed syllabus based on the needs of students. Several opinions regarding teaching materials and textbooks are stated below.

According to the Department of National Education [2] teaching materials are all forms of materials wither written or unwritten used to assist teachers/instructors in carrying out teaching and learning activities. Therefore, teaching materials are important components in the learning process. Furthermore, several experts provide

various opinions regarding textbooks. Suhardjono defines textbooks as standard books compiled by experts in their fields, equipped with compatible teaching facilities, and easily understood by the wearer in schools and colleges used for instructional purposes in certain fields to support a teaching program. Besides, Gyatmi mentions that textbooks are handbooks for courses that are written and compiled by experts in related fields, meet the rules of textbooks, and are officially published and disseminated.

Based on the opinion of several experts, it can be concluded that textbooks are a source of reference containing material sources for student learning that are equipped with learning instructions in the form of printed books compiled by an expert. Textbooks developed must be more systematic and simpler than other commercial books [3]. Therefore, textbooks can be developed following the syllabus and student needs so that classroom learning becomes smoother and more effective.

By using textbooks, students can acquire basic skills and knowledge even before entering the classroom so that classroom learning can be used for memory stabilization activities, conceptual understanding, critical thinking, and knowledge development. According to the Department of National Education (2008), there are some benefits of developing teaching materials for teachers, namely: (a) being able to obtain teaching materials that are following the demands of the curriculum and according to the needs of students; (b) not depending on textbooks which are sometimes difficult to obtain; (c) teaching materials become richer because they are developed using various references; (d) being able to increase the knowledge and experience of the teacher in writing teaching materials; (e) being able to build effective learning communication with students and earn their trust. Besides, the development of teaching materials is also beneficial for students as follows: (a) learning activities become more interesting; (b) students will have many opportunities to learn independently and reduce dependence on teacher attendance; (c) students will find it easier to learn each competency to be mastered.

Regarding the benefits mentioned above, the development of textbooks for Population and Environmental Education courses is necessary due to the unavailability of integrated teaching materials for the PEE course in the Civics Education Study Program of Sriwijaya University. A needs analysis had been carried out by distributing questionnaires to 22 students. The results showed that in the first question, "Apakah anda memiliki teks atau buku pegangan lain untuk mata kuliah PKLH?", 86.4% of the respondents answered no and 13.6% answered yes.

Meanwhile in the second question, "Apakah anda mencari bahan lain selain buku dari yang telah

dirujukan dosen untuk membantu anda dalam memahami suatu materi, lewat modul atau internet”, 95.5% of the respondents answered yes and 4.5% of them answered no. Furthermore, in the third question, “Apakah anda mengalami kesulitan mempelajari mata kuliah PKLH dari buku tersebut? (misalnya karena kelengkapan materinya, teknik penjelasan, formatnya dan lain-lain)”, 86.4% of the respondents answered no and 13.6% of the respondents answered yes. Then, in the fourth question “Apakah anda disediakan modul mandiri yang dibuat oleh pengampu mata kuliah”, 68.2% answered no and 31.8% answered yes.

Furthermore, 90.9% of the respondents answered yes and 9.1% answered no in the fifth question, “Apakah bahan ajar yang digunakan berbasis kontekstual?”. Meanwhile in the sixth question, “Apakah bahan ajar berbasis kontekstual cukup untuk pembelajaran PKLH?” 36.4% of the respondents answered no and 63.3% answered yes. Furthermore, 100% of respondents said yes toward the seventh question, “Apakah bahan ajar yang diharapkan disertai contoh pertanyaan yang berbasis pemecahan masalah?” and the eighth question, “Apakah dengan adanya pemecahan masalah materi yang dibahas akan lebih jelas dan mengerti?”, the ninth question, “Apakah perlu juga materi yang diilustrasikan dengan beberapa kasus yang memerlukan pemecahan masalah?”, and the last question, “Apakah bahan ajar berbasis problem dibutuhkan dalam pembelajaran mata kuliah PKLH?”.

The results of the preliminary study indicate that the PEE course requires textbooks as learning resources to be used by lecturers and students. Furthermore, as the textbook is to be used for students, the book must be able to improve students' critical thinking skills through problem-based learning. Problem-based learning is a learning model that focuses on tracing the root of the problem and solving the problem [4].

Furthermore, Stepien, et al (as cited in Ngalimun) mention that PBL is a learning model that involves students to solve a problem through the stages of the scientific method so that students can learn knowledge related to the problem and at the same time have the skills to solve it.

Similarly, The Director-General of Higher Education [5] defines Problem Based Learning as a learning approach that uses real-world problems as a context for students to learn through critical thinking and problem-solving skills to gain essential knowledge and concepts from the subject matter.

Based on the explanation above, it can be concluded that Problem Based Learning is a learning model that focuses on tracing the root of problems which exist in the real world as a learning context by involving students in the problem-solving process through the stages of the scientific method so that they learn to think

critically and learn through experience in solving the problem to obtain essential knowledge and concepts from the subject matter. Therefore, the development research of textbooks for PKLH courses in the PPKn Study Program of Sriwijaya University.

From the description above, it can be concluded that Problem Based Learning is a learning model that focuses on tracing the root of problems that exist in the real world as a learning context by involving students in the problem-solving process through the stages of the scientific method so that students learn to think critically and learn through experience solving problems to obtain essential knowledge and concepts from the subject matter. Thus, development research of textbook of PEE course for the Civics Education Study Program of Sriwijaya University was conducted.

2. METHOD

The subjects of this study were students of Civics Education Study Program of Faculty of Teacher Training and Education of Sriwijaya University FKIP Sriwijaya University of 2019 academic year from Palembang and Indralaya classes who were taking Population and Environmental Education course. The research was a quantitative descriptive research. The data were collected through tests and observations. The tests were given to the students in the forms of pre-test and post-test as a measuring tool to find out the students' understanding of the materials used. Pre-test and post-test are given to find out whether the material presented is well mastered or not [6]. So that it could measure student learning progress before and after the material is given.

In addition to the tests, observations were carried out to find out students' responses when learning using the developed textbook. Observation is an activity of recording phenomena that is carried out in a structured and systematic manner. Observation was chosen as a method due to its ease to set up and its ability to be disguised without being realized by the observant.

In conducting the observation, an instrument was used as a reference in observing the attitudes shown by students when the learning process took place. After that, data obtained from the observation during the trial process were analyzed. The results of the observations were analyzed descriptively and then presented and interpreted using the modified categories of Sugiyono12 below:

Score

- 81-100 (Very active)
- 61-80 (Active)
- 41-60 (Moderately active)
- 21-40 (Inactive)
- ≤ 20 (Very inactive)

3. RESULTS AND DISCUSSIONS

The objective of the study was to determine the potential impact of Textbook of Population and Environmental Education Subjects Based on Problem-based Learning in improving the critical thinking skills of students of the Civics Education Study Program of Faculty of Teacher Training and Education of Sriwijaya University of 2019 academic year in Indralaya and Palembang classes. The data of the study were collected by using tests and observations. The tests were given to the students as pre-test and post-test in order to determine student learning outcomes after using the PBL-based PEE textbook developed. Meanwhile, the observations were conducted to determine student activities when learning took place. The results of the pre-test and the post-test are presented in Table 1:

Table 1. The results of pre-test and the post-test scores

| No. | Nama | Pretest | Posttest |
|-----|------|---------|----------|
| 1 | A | 75 | 90 |
| 2 | B | 60 | 90 |
| 3 | C | 60 | 95 |
| 4 | D | 60 | 80 |
| 5 | E | 70 | 95 |
| 6 | F | 75 | 75 |
| 7 | G | 50 | 75 |
| 8 | H | 65 | 85 |
| 9 | I | 70 | 80 |
| 10 | J | 65 | 80 |
| 12 | K | 60 | 85 |
| 13 | L | 50 | 90 |
| 14 | M | 75 | 90 |
| 15 | N | 70 | 90 |
| 16 | O | 50 | 95 |
| 17 | P | 40 | 85 |
| 18 | Q | 70 | 95 |
| 19 | R | 65 | 95 |
| 20 | S | 65 | 95 |

Primary data was processed in 2020.

The next stage was to observe the attitudes/responses of students when learning using the developed textbook. The PBL learning model provides opportunities for students to think critically because they are presented with a case and then asked to solve it together Elaine [7]. The results of the observation are presented in the Table 2.

Based on the results of observation on the responses and attitudes of students during the learning process showed the average percentage of 81.5%. The results indicate that students followed the lesson well and brought out the ability to think critically when solving problems given by the lecturer. Problem-based learning also has a positive impact on the mental health of students, this is because students are asked to participate in solving problems that occur, so that there is a sense of self-confidence that arises from within them Bidyadhar [8].

While being observed in the classroom during the learning process, students showed their focus on paying attention to the lecturer in delivering material and not being busy with activities outside of learning. It indicated that the developed textbook brings a good impact on students by facilitating their learning process. This is in line with the benefits of teaching materials for the students proposed by the Department of National Education [2] which include: (a) more interesting learning activities; (b) more opportunities to learn independently and less dependence on teacher attendance; (c) easier learning of each competency to be mastered.

Table 2. The results of the observations

| No. | Indicators | Total | % |
|-----------|---|-------|-------|
| 1. | Students pay attention to the lecturer's explanations. | 20 | 100 |
| 2. | Students are not busy with activities outside of learning. | 20 | 100 |
| 3. | Students are enthusiastic about asking questions to the lecturer | 10 | 50 |
| 4. | Students actively find solutions to problems given by the lecturer. | 15 | 75 |
| 5. | Students can provide solutions to problems given by the lecturer. | 25 | 82,5 |
| Total | | 90 | 407,5 |
| Rata-rata | | | 81,5 |

Primary data was processed in 2020.

In addition, the students also actively asked questions during the learning process. It indicated that the developed textbook had successfully triggered students to have better ability in analysing ideas and higher curiosity about the problems given by the lecturer.

Furthermore, all of the students used the developed textbook. During the process of learning, the students played an active role in solving the problems given by the lecturers, which were also written in the textbook.

When the observations were carried out, students seemed to always coordinate with peers, ask questions to the lecturer, and look for various sources to solve the problems given. It was proved, based on the observation, that the developed textbook has been implemented well. Accordingly, Rusman [9] stated that problem-based learning is an innovation in learning because students' thinking skills are optimized through systematic teamwork so that all can be empowered to

hone, test, and develop their thinking skills continuously. This confirms that the Textbook is a handbook for a course written and compiled by experts in related fields and comply with textbook rules and are published officially and disseminated and used in the learning process [10].

Continuity in thinking is very important, especially for students who will actually work directly in the community as agents of change and providers of solutions to existing problems so that students are accustomed to thinking critically. Critical thinking is a skilled activity that can be performed well and meets various intellectual standards such as clarity, relevance, adequacy, coherence, etc.

Furthermore, another thing that appeared during the observation process was the confidence of students when conveying their design ideas with logical reasons and supported by strong evidence in overcoming the problems given. Critical thinking allows someone to find the truth because they have gone through a systematic process, namely formulating and evaluating evidence, logic, and the language underlying other people's statements. In line with this, Dewey [11] states that critical thinking is an active, continuous, or continuous and thorough consideration process carried out with full confidence in the truth that is conveyed.

Critical thinking skills are closely related to the learning methods that lecturers provide to students, the right learning method will be able to trigger students' critical thinking skills, but learning methods that only prioritize conventional styles cannot awaken students' critical thinking power [12]. This statement same with [13] Pedagogic ability is the basic ability of the learning process, not only possessed by teachers but also students. Collaboration of these good pedagogical skills will be able to create a quality learning process, so that the ability to think critically and pedagogically that is collaborated with problem-based learning media is an excellent combination of pursuits. Learning is not only a transfer of course knowledge from teachers to students but students are given problems that are requires searching, observation, experiment, analysis, synthesis, comparison, thinking and inference by students, so that students find itself an answer to a concept or theory. The main things that should be student experience is a form of ways important to process and acquire knowledge, skills and attitudes become a necessity [14].

The active attitude of asking questions and seeking information related to the problems raised by the lecturer is the main factor in the characteristics of problem-based learning that provokes students' critical thinking attitudes. Thus, it is integrated into a textbook of Population and Environmental Education course based on the Problem-based Learning for Civics Education Study Program of Sriwijaya University.

4. CONCLUSION

The results of the study obtained from the tests and observations have revealed that the textbook of Population and Environmental Education developed based on Problem-based Learning was effective in improving students' positive attitudes in learning. It is also proven that the textbook has potential impacts on improving students' critical thinking. Finally, the PBL-based of problem based learning textbook is appropriate to be used as course materials.

AUTHORS' CONTRIBUTIONS

The correspondence author with other authors jointly carried out this research. The correspondence author acts as the research organizer and provides direction for the course of the research. The second and third authors conducted the validation and product trials in the field, after that the authors jointly compile the research results.

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