Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 8 Nomor 3 May 2024 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v8i3.9034

# PBL-Based LKPD Development to Improve Students' Critical Thinking Skills in Business Economics Subjects at Vocational Schools

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## ABSTRACT

The weak critical thinking skills of students today encourage educators to seek other ways to attract students' interest in learning. One solution is to develop PBL-based LKPD. Therefore, the present study aims to (1) develop PBL-based LKPD, (2) analyze the effectiveness of the developed PBL-based LKPD, and (3) determine the practicality of PBL-based LKPD. This study is a Research and Development (R&D) research using the 4D model (Define, Design, and Disseminate). The effectiveness of the LKPD, which was developed based on the independent sample t-test test, obtained a sig. value 0.001 < 0.05, which means that there is a significant difference between the test results of the experimental class students and the test results of the control class students. Furthermore, based on the N-Gain score test results in the experimental class using PBL-based LKPD, there was 0.71 with high criteria while the control class using conventional LKPD obtained 0.30 results with low criteria. The practicality of the LKPD developed was assessed based on the teacher's response with an average percentage score of 90% in the very practical category and student responses with an average percentage score of 88.48% in the very practical category. Hence, the use of LKPD is considered effective in improving students' critical thinking skills.

***Keywords*: *business economics, pbl-based lkpd, critical thinking skills***

| Submitted | Accepted | Published |
|---|---|---|
| 08 November 2022 | 11 May 2024 | 30 May 2024 |

| | | |
|---|---|---|
| **Citation** | : | Mariana., Gimin., & Kartikowati, S. (2024). PBL-Based LKPD Development to Improve Students' Critical Thinking Skills in Business Economics Subjects at Vocational Schools. *Jurnal PAJAR (Pendidikan dan Pengajaran), 8*(3), 269-275. DOI: http://dx.doi.org/10.33578/pjr.v8i3.9034. |

## INTRODUCTION

The curriculum is a guideline for activities and tools for educational institutions, in which a number of learning experiences are communicated that reflect and are absorbed from the life of the community where the educational process takes place. This means that the curriculum can provide direction and benchmark skills to students after completing the learning program (Pratiwi Barnadetta et al, 2021).

Sa'dan Akbar (2013) stated that the achievement of the curriculum really depends on the teacher's ability to develop learning tools, because learning tools are applied in daily learning practices. Teachers are obliged to prepare learning tools completely and systematically so that learning takes place in an interactive, inspiring, fun and motivating way for students. Juliana Rakony and Idris Harta (2016) stated that apart from the syllabus, teachers must prepare a learning implementation plan as the main part of success in the learning process. Apart from the learning implementation plan, something that is no less important in implementing learning is the availability of student worksheets (LKPD). A teacher who wants the learning carried out to activate all students, then the teacher must prepare student worksheets.

Student Worksheets (LKPD) are one of the teaching materials prepared by teachers which are useful for the learning process that will be given to students. This LKPD will determine the creativity and effectiveness of the learning that will be carried out by students (Halifah and Adnan, 2019). LKPD contains teaching material that has been packaged in such a way that students are expected to be able to study the teaching material independently. In the LKPD, students will receive material, summaries and assignments related to the material.

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LKPD can support increased student activity in learning and help teachers direct students to discover concepts through self-minimizing activities, developing process skills, and the role of educators in learning. In the learning process it is very important because 1) LKPD can benefit from LKPD greatly increasing students' activities in learning 2) its use in learning can help teachers activate students in learning and and help teachers direct students to discover concepts through their own activities 3) LKPD can train participants students develop process skills and optimize learning outcomes as well as as a guide in learning 4) LKPD can develop students' thinking creativity in solving various problems related to daily life 5) LKPD can guide and direct and empower students to learn independently, 6) LKPD can improve critical thinking skills and improve the ability to think collaboratively in a team with other people.

Researchers conducted an analysis of the widely used LKPD with the following analysis results: 1) the questions in the LKPD do not yet embed concepts from the material and are less varied where students are only asked to fill in the blanks or answer multiple choice questions. 2) The LKPD is not in accordance with the demands of the 2013 curriculum 3) The LKPD is more active in the role of the teacher than the student 4) The LKPD used has not guided, directed and empowered students to learn independently 5) The LKPD used has not been able to train students' critical thinking skills in solving problems.

One model that can be used in learning is the Problem Based Learning model. Arie Anang Setyo, et al (2020) stated that the Problem Based Learning model is a learning model that is characterized by real problems and materials for teaching students in the learning process, so that they are able to develop knowledge and critical thinking abilities as well as problem solving skills. PBL learning has several advantages, including: 1) Learning is more meaningful because students learn to solve their own problems and apply their knowledge to solve problems, making it easier for students to master the concepts being studied. 2) During the learning process, students can simultaneously integrate the knowledge and skills they have and apply them in relevant contexts. 3) The problems presented in learning are related to real world problems so that they can increase students' motivation and interest in the material they are studying. 4) PBL can develop critical thinking skills, foster students' initiative and learning independence and develop interpersonal relationships in group learning.

Based on the results of observations in the field and the results of discussions with teachers in the field of business economics learning at SMK 4 Pekanbaru, it was found that teachers still rely on LKPD published by publishers which contain material summaries and practice questions which have not been presented in an interesting way, making students less active during learning. ongoing and the teaching materials used do not support students to be critical in carrying out thinking skills in carrying out the tasks given. The problems above are a challenge for teachers to solve the problem. Teachers need ideas to solve these challenges through learning. To overcome the above problems and train students' thinking skills, LKPD and active learning models are needed where the learning is student centered where the teacher is only a guide in the process.

## METHOD

This research is development research with a Research and Development (R&D) research design and uses a 4-D model which consists of 4 main stages, namely: define, design, defelop and disseminate. The sampling technique is carried out in 2 stages, the first is determining the sample class. Determination of the sample class was carried out by conducting a homogeneity test on 3 AKL major classes at SMKN 4 Pekanbaru. After carrying out the homogeneity test, 2 homogeneous classes were taken to be used as samples. Second, the determination of the experimental class and control class was carried out by drawing lots for the 2 classes.

In the LKPD development process stage, an interview was conducted with 1 business economics teacher at SMKN 4 Pekanbaru to find out the state of business economics learning at SMKN 4 Pekanbaru. Next, to find out the effectiveness of PBL-based LKPD, tests are given in the form of a pretest (before learning activities) and a posttest (after learning activities). This test was given to students in the

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experimental class which used PBL-based LKPD, and the control class which used conventional LKPD. The research design used was the matching only pretest-posttest control group design model. The pretest/posttest was given to the control class and experimental class in the research. Class determination is carried out previously with prerequisite tests, namely the normality test and homogeneity test. The research design can be seen in table 1.

**Table 1. Research Design**

| Research design | | | |
|---|---|---|---|
| Class | Pretest | Treatment | Posttest |
| A | O1 | X | O2 |
| B | O3 | - | O4 |

To determine the level of practicality of PBL-based LKPD, use a questionnaire with 6 questions which are assessed using a 1-5 Likert scale. This practicality questionnaire was given to 1 business economics teacher and 33 students in class

**Table 2. Practicality criteria for LKPD**

| Percentage | Criteria |
|---|---|
| 81% - 100% | Very Practical |
| 61% - 80% | Practical |
| 41% - 60% | Quite Practical |
| 21% - 40% | Less Practical |
| 0% - 20% | Very less |

## RESULTS AND DISCUSSION

### LKPD Development Process

The LKPD development process is based on 4d stages including define, design, defelop and disseminate. The LKPD development process based on these stages is described as follows. The definition stage is the initial stage carried out in this research, this stage aims to define the requirements and needs in learning. The stages carried out include initial final analysis, student analysis, task analysis, and material analysis.

Based on the analysis carried out, the results obtained were that in the learning process, the teacher used teaching materials in the form of package books and handouts made by the teacher. In the learning process the teacher only explains the subject matter to the students, after that the teacher gives instructions to the students to work on the questions in the textbook. Meanwhile, the learning media used by teachers is only power point. Therefore, it is necessary to develop LKPD to solve this problem. The subject matter used in this research is the rights and obligations of workers.

Next is the design stage. At this design stage, there are several stages carried out including format design, the student worksheets developed are LKPD which are made digitally and interactively so that they can attract students' interest in learning and be active in learning activities and can improve their critical thinking skills. The RPP used is also arranged in such a way that it contains the syntax of the Problem Based Learning model and the two initial designs of the LKPD include. At this stage, LKPD design activities are carried out which are developed based on the RPP. LKPD contains material on the rights and obligations of workers which is presented using the Problem Based Learning model to improve students' critical thinking skills.

Next, at the development stage, researchers carry out validation test activities for the product being developed. From the validation results, revisions or improvements are then made according to suggestions/input from LKPD expert validators and material expert validators. The validation process is carried out until the two expert validators state that the LKPD is suitable for testing.

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Dissemination stage, at this stage is carried out to expand Problem Based Learning based LKPD. The distribution of LKPD is still being distributed via the WhatsApp group application to students. So only students who are members of the WhatsApp group can download the LKPD. This LKPD was also distributed to Business Economics teachers at SMKN 4 Pekanbaru. Dessiminate in this research is also a seminar on the results and preparation of articles for publication in journals.

**Determination of Sample Class**

Before determining the class that will be the research subject, a homogeneity test is first carried out on the population at SMKN 4 Pekanbaru, which consists of 3 classes including X AKL 1, X AKL 2, and Appendix 12). The results of data analysis of homogeneity test results are presented in Table 3.

**Table 3. Homogeneity Test Results**

| class | Levene Statistics | df1 | df2 | Sig. |
|---|---|---|---|---|
| **X AKL 1 X AKL 2** | 4.366 | 1 | 65 | 0.041 |
| **X AKL 1 X AKL 3** | 5.591 | 1 | 65 | 0.021 |
| **X AKL 2 X AKL 3** | .072 | 1 | 64 | 0.789 |

Based on the results of the homogeneity test in Table 3, it shows that the data has a homogeneous variance if the sig value is > 0.05. Based on the homogeneity test results table above, it is known that the homogeneous data are classes X AKL 2 and

Determination of the experimental class and control class was carried out by drawing lots. The lottery was carried out for classes X AKL 2 and After the lottery was carried out, class X AKL 2 was determined as the control class and class X AKL 3 as the experimental class.

**Effectiveness of LKPD**

The homogeneity test is carried out to show that two or more groups of sample data that have been taken come from populations that have the same variance. The results of the homogeneity test on the pretest scores can be seen in Table 4 below:

**Table 4. Homogeneity Test Results**

| | Levene statistic | Df | Df2 | Sig. |
|---|---|---|---|---|
| **Test results** | 1.289 | 1 | 64 | .260 |

Source: SPSS Statistics 25 processed results

Data is said to be homogeneous if the Sig value. > 0.05. Based on Table 4, it is known that the Sig. 0.260 > 0.05 means that the sample data that has been taken comes from a population that has the same variance. The hypothesis test used in this research is the independent sample T-test. The conditions for testing the independent sample t-test are if the Sig. > 0.05, then there is no difference in the learning outcomes of experimental group and control group students and if the Sig. < 0.05 means there is a difference in the learning outcomes of the experimental group and the control group. The Independent Sample T-test was carried out on the results of the posttest scores for the experimental class and the posttest scores for the control class. Data related to the independent sample T-test are in Table 5. below:

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**Table 5. Independent Sample T-test Results**

| | T | Df | Sig (2-tailed) |
|---|---|---|---|
| **Test results** | 6.004 | 64 | 0,001 |

Source: SPSS Statistics 25 processed results

Based on the results of the analysis in Table 5. above, it is known that the sig. is 0.001 < 0.05 and in the T-Test column the calculated t value > t table (6,004 > 1,669) is obtained, which means that Ho is rejected and Ha is accepted. This means that there is a significant difference between the test results of experimental class students and the test results of control class students. The learning outcomes of experimental group students who used PBL-based LKPD in learning were different from the learning outcomes of control group students whose learning used existing LKPD.

Data analysis of students' critical thinking abilities was carried out using the N Gain Score test which aims to determine the category of improvement in students' critical thinking abilities in experimental class learning activities (Appendix 22) and control class (Appendix 23). The N Gain Score test results can be observed in Table 6 below:

**Table 6. N Gain Score Test Results**

| No | Kelas | Learning utcomes | Average | Score Gain | N | Criteria |
|---|---|---|---|---|---|---|
| **1** | Experimental Class | Pretest | 40,94 | 0,71 | | Tall |
| | | Posttest | 82,32 | | | |
| **2** | Control Class | Pretest | 40,67 | 0,30 | | Low |
| | | Posttest | 59,97 | | | |

Source: SPSS Statistics 25 processed results

Table 6 shows that the average normalized gain (N Gain) in the experimental class is 0.71 in the high category. Meanwhile for the control class it is 0.30 in the low category. This means that students' critical thinking using PBL-based LKPD is better than classes that do not use PBL-based LKPD (control class).

**Practicality of LKPD**

Assessment of the practicality of the developed LKPD is carried out using a test Practicality of LKPD. The LKPD Practicality Test aims to determine the practicality of the LKPD developed based on user responses. This test was carried out on a limited basis (small scale) on 1 business economics educator and 33 class X AKL students at SMK Negeri 4 Pekanbaru. The practical results are described as follows:

The educator practicality questionnaire consists of 6 questions which are assessed using a 1-5 Likert scale. Data from the educator questionnaire results can be seen in Table 7.

**Table 7. Results of Educator Practicality Questionnaire Data Analysis**

| No | Respondent | Total score | Score Percentage |
|---|---|---|---|
| **1** | Educator | 27 | 90 % |

Based on Table 7, the percentage of practitioners' scores was obtained with an average score of 90% in the very practical category. The student practicality questionnaire consists of 17 questions which are assessed using a 1-5 Likert scale. Data from the student questionnaire results can be seen in Table 8.

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**Table 8. Results of Student Practicality Questionnaire Data Analysis**

| No | Respondent | Total score | Score Percentage |
|---|---|---|---|
| **1** | Learners | 876 | 88,48 % |

Based on Table 8, the results of the practicality questionnaire data analysis of students consisting of 33 people at SMK Negeri 4 Pekanbaru, it is known that the LKPD is in the very practical category with an average percentage score of 88.48% in the very practical category.

Based on learning activities carried out using PBL-based LKPD in the experimental class, and conventional LKPD in the control class, it was concluded that there was a significant difference in students' critical thinking abilities between the experimental class and the control class. The differences in critical thinking abilities indicate that the use of PBL-based LKPD in learning has had a positive influence as indicated by an increase in critical thinking ability test results for the experimental class, higher than the control class. The use of PBL-based LKPD can improve students' critical thinking skills because PBL-based LKPD has the advantage of being able to enable students to learn independently.

This is in line with research by Herzon, et al (2018) that the Problem Based Learning (PBL) learning model is effective and suitable for use in the learning process which can improve critical thinking skills, the Problem Based Learning (PBL) learning model has a positive impact on thinking. critical of students. The implementation of experimental classes with the Problem Based Learning (PBL) learning model can train critical thinking skills, the use of this learning model will result in students being more active and challenging in solving problems on questions, and can result in students in the learning process not depending on the teacher, but rather can discuss between friends.

Students' critical thinking abilities using PBL-based LKPD are better than classes that do not use PBL-based LKPD (control class). Students look active in the learning process, and students can learn independently and think critically. This is in line with what Lisna Siti and Moersetyo Rahadi (2014) said, some of the advantages of the Problem Based Learning LKPD model include providing challenges for students to discover new knowledge for students, helping students transfer their knowledge to understand problems in real life, and developing students' abilities. critical thinking.

This result can be seen by an increase in learning in terms of students' critical thinking, where the experimental class is larger than the control class, and is supported by research by Ardiyanti (2016) that by implementing the Problem Based Learning (PBL) learning model, students' way of thinking will experience an improvement.

The use of PBL-based LKPD will increase students' interest in learning, but in its application there are also several difficulties, including the use of digital LKPD which requires students to be able to access applications and the web using each student's cellphone, making students have to have a data package. So it makes implementing PBL-based LKPD a little difficult because the school doesn't use wifi. It is hoped that future researchers can create other LKPD that can be accessed offline and make it easier for students to study anywhere and anytime.

## CONCLUSIONS AND RECOMMENDATION

Based on the research results, it can be concluded that PBL-based LKPD can be used in the learning and teaching process and can improve students' critical thinking skills. From the results of the research that has been carried out, the researcher proposes the following recommendations and suggestions:

1. The limitations experienced by researchers are not an obstacle to developing PBL-based LKPD. For future researchers who want to conduct research with the same product, it is best to maximize the display of LKPD, images and videos.
2. For future researchers, who are interested in development research (R&D), especially those related to business economics subjects, it is best to carry out full and repeated trials.

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