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THE IMPACT OF THE PROBLEM-BASED LEARNING MODEL WITH DIGITAL STUDENT WORKSHEETS ON STUDENT LEARNING OUTCOME AT SMA PGRI RUMPIN

Nina Mardiana[1)] and Saptina Retnawati[2)]

[1)] Student in the Economic Education Study Program, Pamulang University, South Tangerang City, Indonesia
[2)] Lecturer in the Economic Education Study Program, Pamulang University, South Tangerang City, Indonesia

ABSTRACT

Based on observations, the lack of teacher innovation in utilizing technological developments, such as the digital student worksheets used is still softcopy so that it is less attractive and does not meet the needs of students. This study intends to develop digital-based student worksheets in the Economics subject of SMA PGRI Rumpin. The methodology utilizes Quasi Experiment with Quantitative research methodology. A total of 42 grade X students from the 2023/2024 academic year participated in this study. The tool for data collection in this study was a question item instrument. Student learning outcome before the Problem Based Learning (PBL) model was applied were relatively low, the percentage of graduation in the experimental class was 16%. Likewise, the control class had a graduation percentage of 21%. After the PBL model was implemented, student learning outcome increased, the percentage of graduation in the experimental class was 100%. According to the independent sample t-test, the obtained significance value of 0.00 < 0.05 indicates that PBL model with digital student worksheets has an effect on student economics learning outcome at SMA PGRI Rumpin.

Keywords*: Problem Based Learning, Digital Student Worksheets, Economics Subject.*

INTRODUCTION

Schools serve as formal educational institutions that significantly contribute to the development of human resources. Education helps individuals cultivate their potential, which aligns with the functions and goals of national education as stated in the National Education System Law No. 20 of 2003, Chapter II, Article 3.

Based on this article, there are several key concepts in education. First, education is a deliberate and structured endeavor. Second, the educational process is directed at creating a

conducive learning atmosphere. Third, this learning atmosphere aims to enable students to develop their potential. Fourth, the ultimate goal of education is to produce individuals with inner strength, discipline, character, intellect, moral integrity, and competencies essential for societal, national, and civic life.

Education has become increasingly important in the era of Industrial Revolution 4.0. The role of teachers as educators is not only to transfer knowledge but also to provide students with analytical thinking capabilities and solution-oriented skills, creativity, innovation, and communication skills. Therefore, curriculum development is expected to enhance students' pedagogical dimensions, life skills, collaboration, critical thinking, and creativity (Lase, 2019). Students' problem-solving skills need to be supported through appropriate learning models, one of which is Problem-Based Learning (PBL) (Datur, 2017).

Nursita, et. al (2014) stated that to enhance students' ability to solve problems, an innovative learning approach is needed that motivates learners to think, analyze, and resolve issues. The PBL model helps students address issues relevant to daily life. This is supported by Hastuti's (2016) research, which states that PBL actively involves students in the learning process.

Economics is a subject that is essential in fostering students' analytical thinking abilities. Therefore, it must be mastered optimally in schools. In its teaching process, teachers relate the subject matter to students' real-life experiences and use appropriate teaching media. Learning resources can come from tools, materials, or phenomena in the surrounding environment. PBL is considered highly suitable for teaching economics, as it emphasizes real-life problem-solving. This model helps students find solutions based on real evidence from their environment.

In practice, the implementation of the 2013 curriculum still faces several challenges. Many teachers continue to use conventional teaching methods, such as lectures and question-and-answer sessions, which may not effectively engage students. One major issue is the limited use of media in the teaching process. This becomes even more concerning as technological advancements continue to grow each year, requiring educators to adapt and integrate new approaches in their teaching strategies.

Educational technology plays a crucial role in improving teaching methods by applying scientifically proven principles from various fields. By leveraging technological innovations, educators can develop more effective learning materials to enhance the quality of education.

One example of such a learning tool is the digital student worksheet.

Various online platforms are now available to create digital student worksheet that are more engaging and interactive. Traditionally, student worksheet was printed in hardcopy format, but with digital advancements, they can now be developed using applications or websites, making them available in softcopy format. This shift allows for easier distribution to students, offering a practical solution to some of the challenges in the learning process.

Another issue is the lack of variety in teaching media. When lessons rely solely on verbal explanations without additional interactive elements, students may lose interest and motivation. This one-way interaction between teachers and students often results in a passive learning environment, where students simply listen without actively engaging.

Consequently, students may struggle to retain the information they have learned, leading to lower academic performance. These challenges are common in many schools, including SMA PGRI Rumpin, where learning outcomes have been less than satisfactory. Addressing these issues requires a shift toward more interactive and technology-driven learning methods to improve student engagement and comprehension.

METHODS

This study adopts a quantitative research approach, focusing to examine a specific population or sample. According to Arikunto (2019:27), quantitative research is methodology that extensively uses numerical data, encompassing data collection, analysis, and result presentation. This study employs a quasi-experimental method, utilizing a Non-Equivalent Control Group design, which involves administering a pre-test before treatment, then providing treatment to the experimental group, and finally conducting a post-test for all groups, both the experimental and control groups.

The population in this research encompasses a group of objects or subjects possessing particular attributes and characteristics specified by the researcher for examination and conclusion formulation (Sugiyono, 2015). Meanwhile, the sampling method employed is Purposive Sampling, where samples are chosen based on specific criteria and considerations (Sugiyono, 2015).

The methods employed for data gathering in this research encompass observation and testing. Observations were conducted on the learning process of the economics subject in

classes X1, X2, and X3 at SMA PGRI Rumpin. Additionally, testing techniques were employed to assess student learning outcomes. According to Riduwan (2018), a test consists of a series of questions or exercises aimed at assessing an individual's or a group's competencies, knowledge, cognitive abilities, skills, or talents. Students' academic performance was evaluated through a pre-test given prior to the learning process and a post-test conducted afterward.

The research instrument used refers to tools that assist in data collection to ensure the research is conducted systematically and efficiently. According to Sugiyono (2015), research instruments can take the form of questionnaires, checklists, interview guidelines, observation sheets, test questions, attitude scales, and others.

RESULTS AND DISCUSSION

The Mean Attainment of Economics Learning Outcome Among 10th-Grade Experimental Class Students at SMA PGRI Rumpin Following Instruction Using the Problem-Based Learning (PBL) Model with Digital Student Worksheets

According to the study obtained in the experimental class at SMA PGRI Rumpin, the average student learning achievement before being taught using the PBL model with digital student worksheets showed that no students reached the minimum competency criteria. However, after implementing the PBL model with the support of digital student worksheets, student learning achievement improved significantly, reaching the minimum competency criteria.

The implementation of the PBL model enhances students' problem-solving skills by placing them in real-life situations that require creative solutions. By facing complex problems, students must develop strategies to identify, analyze, and collaboratively solve issues with their classmates. Through this process, they learn to take initiative, think critically, seek relevant resources, and formulate effective solutions. Additionally, since PBL encourages reflection, students learn not only from their own experiences but also from their peers' experiences, which deepens their overall understanding of the problem-solving process.

Thus, PBL not only facilitates conceptual understanding but also develops essential problem-solving competencies for future success. This aligns with Tan's opinion in Nasution (2016), which states that PBL is an educational innovation because, in this model, students' thinking abilities are fully optimized through systematic group or team collaboration. As a

result, students are able to sharpen, refine, assess, and continuously develop their critical thinking abilities.

During the implementation of the study, students demonstrated high enthusiasm for learning because they were actively engaged in solving real-world problems. They felt a sense of accomplishment when successfully resolving an issue, which ultimately motivated them to continue learning. Moreover, students also gained more confidence in completing tasks and considering various perspectives throughout the learning journey.

The findings of this study are supported by the research of Rifai and Sutarna (2020), who stated that the PBL model is defined by the application of real-world problems as learning material. This model trains students to develop problem-solving and strategic thinking abilities. PBL engages students in higher-order thinking processes when dealing with problem-based situations, including solving problem-based questions, which ultimately enhances their learning outcomes.

The Achievement of Classical Mastery in Economics Learning Outcome of Grade X Experimental Class Students at SMA PGRI Rumpin Following Instruction Using the Problem-Based Learning (PBL) Model with Digital Student Worksheets

The results of the study indicate that the mastery of economics learning outcomes among Grade X experimental class students at SMA PGRI Rumpin reached 100%, exceeding the minimum standard of 70%. All students successfully reached the minimum mastery level following instruction with the PBL approach assisted by digital student worksheets. These results indicate that the application of this learning approach effectively encourages students to be more active, think critically, and logically in understanding economic concepts.

According to Raharjo (2020), the PBL learning model has several advantages, including: (1) preparing students to apply problem-solving skills in practical situations, (2) enabling them to construct their knowledge through active learning, (3) focusing on relevant problems so that unnecessary materials are excluded, reducing the burden of memorization, (4) encouraging scientific activities through group work, (5) familiarizing students with utilizing various learning resources such as libraries, the internet, interviews, and observations, (6) allowing students to assess their own learning progress, (7) enhancing scientific communication skills through discussions and presentations, and (8) helping students overcome learning difficulties through peer teaching or peer tutoring.

To ensure the success of the learning journey, teachers should be aware of students' needs and learning styles while presenting material in an engaging and relevant manner. One effective approach is utilizing digital student worksheets, which significantly enhance learning outcomes in several ways. First, digital student worksheets present interactive and engaging learning materials, including dynamic videos and images, which help students grasp concepts more effectively and quickly. Second, interactive features such as quizzes, simulations, and exercises make learning more enjoyable and provide students with opportunities to reinforce their understanding with immediate feedback. Third, broader accessibility allows students to learn according to their own styles, both inside and outside the classroom, without space and time constraints.

This aligns with research by Ayunda, Lufri, and Alberida (2023), which states that PBL has the potential to strengthen students' analytical thinking. Additionally, Swiyadnya et al. (2021) emphasize that students' problem-solving abilities do not develop automatically, necessitating supportive learning media for problem-based learning. PBL requires students to gather as much information as possible, identify problems, analyze them, and find appropriate solutions (Lestari & Syamsurizal, 2021).

Furthermore, Titanika (2020) states that the effectiveness of PBL-based student worksheets is demonstrated through students' final learning outcomes and their positive feedback. Research by Mairani et al. (2022) further supports this, concluding that PBL-based electronic student worksheets are deemed suitable for learning, receiving highly positive responses from students.

Thus, the use of the PBL learning model alongside digital student worksheets has been proven to elevate students' economics learning outcomes and foster critical thinking and problem-solving skills, both of which are fundamental for overcoming future educational challenges.

Meaningful Difference Among the Average Economic Learning Outcome of Students in Class X Experimental and X Control at SMA PGRI Rumpin

Based on the research results, there is a meaningful difference among the average economic learning outcomes of students in class X experimental and X control. The average learning outcome of class X experimental before adopting the Problem-Based Learning (PBL) model with digital Student Worksheets (SW) was 50.93, then after being taught using the PBL

model with digital SW, it increased to 85.71. Meanwhile, the average learning outcome of class X control, which delivered through the traditional lecture-based approach, only increased from 50.36 in the pre-test to 62.29 in the post-test. These results prove that the implementation of the PBL model with digital SW significantly enhances students' average academic performance.

During the research implementation, the class X experimental used the PBL model assisted by digital SW, while the class X control used the conventional or lecture model. Learning in the experimental class began with the teacher conducting an apperception to stimulate students' interest in the topic to be discussed through short stories and opening questions. After that, the teacher divided students into several groups consisting of 6-7 students. The teacher first provided guidance on using the digital SW, then introduced students to a challenging, relevant, and engaging problem.

Students identified what they knew about the problem and formulated questions that needed to be answered to solve it. They then conducted research to gather the necessary information, analyzed data, and developed a deep understanding of the problem. Throughout this process, students worked collaboratively in teams, discussed, and exchanged ideas to achieve the best solution. Finally, students presented their solutions to their classmates and received feedback from both the teacher and their peers while reflecting on the learning process and identifying what they had learned. The learning activities became more engaging and helped students better understand the material by being directly confronted with real-world problems.

Unlike the experimental class applied an alternative method, the control class adhered to the conventional lecture model, required students to sit and listen to the teacher without opportunities for interaction or active participation. Students tended to receive the material passively without asking questions or discussing the topics being presented. This learning model often made students bored and less motivated due to the lack of variety in teaching methods and student engagement. As a result, students may have difficulty understanding the material because they lack the chance to implement their knowledge in relevant contexts.

Variation in learning is essential because it provides students with opportunities to engage actively in the learning process. According to Rahmat and Jannatin (2018), the teacher's teaching style and students' interest influence learning, as these factors determine the level of student engagement. Based on this research, this suggests that the teacher's method of teaching affects how the material is delivered, while students' interest determines how engaged they are

in learning.

Thus, the level of student engagement is influenced by how well the teacher's teaching style aligns with students' interests. For example, when the teacher's teaching style matches students' interests, they are more likely to be motivated and engaged in learning. Therefore, it is crucial for teachers to understand students' learning styles and consider their interests when designing and delivering learning materials.

This is consistent with the research of Pujiasih (2020), who stated that variation in teaching styles is an instructional activity aimed at preventing boredom in class, creating a conducive teaching and learning environment, and encouraging students' enthusiasm and full participation.

This finding is further aligned with earlier research carried out by Titi Suryati (2020), which showed that the implementation of the PBL model in class XI IPS 4 of Jalaksana 1 Public High School improved students' academic achievement, as evidenced by enhancement of the average scores between pre-test and post-test. The average score reached 81.71, and the count of students who achieved the minimum competency standard reached 24 students or 85.71% of the total students in class XI IPS 4. Additionally, learning using the PBL model in class XI IPS 4 increased students' learning motivation, as indicated by a 14.29% increase in the average questionnaire score in the high and very high categories from Cycle I to Cycle II.

CONCLUSION

Based on the explanation regarding the influence of the Problem-Based Learning (PBL) with Digital Student Worksheets on learning outcome in the economics subject at SMA PGRI Rumpin, this indicates that:

1. The average learning outcome of class X experimental students after participating in lessons using the PBL with digital student worksheets in economics was 85.71. The one-sample t-test output shows a significance value of 0.000, which is below the 0.05 threshold, leading to the rejection of H0 and acceptance of H1. This indicates that students' learning outcomes after being taught using the PBL model are not equal to 70 but rather 85.71, which is above the minimum competency standard of 70.
2. The classical mastery of economic learning outcomes for class X experimental students is not equal to 70% but rather 100%. This result was achieved because the implementation of the PBL model with digital student worksheets falls into the "good" category for use, as all

students who initially did not reach the minimum competency standard were able to achieve it after participating in lessons using the PBL model assisted by digital student worksheets.

3. There is a significant difference between the average economic learning outcomes of class X experimental and X control. This can be seen from the average learning outcome of the X experimental class before participating in lessons using the PBL model with digital student worksheets, which was 50.93. After participating in lessons using the PBL model, it increased to 85.71. Meanwhile, the average learning outcome of the X control class in the pre-test was 50.36. Following instruction through the conventional lecture-based approach, the average learning outcome was 62.29.

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