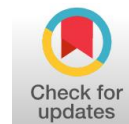


# Model Pembelajaran *Problem Beased Learning* (PBL) Menggunakan Kartu Bridge Terhadap Hasil Belajar Siswa Pada Materi Peluang

## Problem Based Learning (PBL) Learning Model Using Bridge Cards on Student Learning Outcomes in Opportunity Materials



Betri Astriani<sup>1)</sup>, Helni Indrayati<sup>2)</sup>, Domi<sup>3)</sup>

<sup>1,2,3</sup>STKIP MUHAMMADIYAH PAGARALAM

Email : [betryzillah@gmail.com](mailto:betryzillah@gmail.com)

Email : [helniindrayati@yahoo.com](mailto:helniindrayati@yahoo.com)

Email : [domi\\_rozak@yahoo.com](mailto:domi_rozak@yahoo.com)

### Abstrak

Rumusan masalah dalam penelitian ini adalah “Apakah Model Pembelajaran *Problem Beased Learning* (PBL) Menggunakan Kartu Bridge Efektif Terhadap Hasil Belajar Siswa Pada Materi Peluang Kelas VIII SMP Negeri 2 Pagaram Tahun Ajaran 2018/2019?”. Tujuan penelitian ini adalah untuk mengetahui Keefektifan Model Pembelajaran *Problem Beased Learning* (PBL) Menggunakan Kartu Bridge Terhadap Hasil Belajar Siswa Pada Materi Peluang di Kelas VIII SMP Negeri 2 Pagaram Tahun Ajaran 2018/2019. Metode penelitian metode eksperimen dengan desain pretest-posttest control group desain. Sampel penelitian ini adalah kelas VIII E sebagai kelas eksperimen dengan jumlah siswa yaitu 31 dan  $\bar{x}$  yaitu 70,67 sedangkan sampel di kelas kontrol kelas VIII H dengan jumlah siswa yaitu 31 dan  $\bar{x}$  yaitu 60,64. Teknik pengumpulan data yang digunakan dokumentasi dan tes. Teknik analisis data menggunakan uji t. Pada kelas eksperimen dengan nilai  $\bar{x}$  yaitu 70,67 dan S yaitu 13,00 sedangkan pada kelas kontrol  $\bar{x}$  yaitu 60,64 dan S yaitu 13,52 didapat  $t_{hitung}$  3,1206 >  $t_{tabel}$  1,701, maka  $H_0$  ditolak  $H_a$  diterima, berarti hipotesis penelitian diterima. Jadi Model Pembelajaran *Problem Beased Learning* (PBL) Menggunakan Kartu Bridge Efektif Terhadap Hasil Belajar Siswa Pada Materi Peluang Di Kelas VIII SMP Negeri 2 Pagaram Tahun Ajaran 2018/2019.

**Kata kunci:** *Problem Beased Learning* (PBL), Kartu Bridge

### Abstract

The formulation of the problem in this study is "Is the Problem Beased Learning (PBL) Learning Model Using Bridge Cards Effectively Against Student Learning Outcomes in Class VIII Opportunity Materials in Pagaram 2 Public Middle School Academic Year 2018/2019?". The purpose of this study was to determine the effectiveness of Problem Beased Learning (PBL) Learning Models Using Bridge Cards Against Student Learning Outcomes in Opportunity Materials in Class VIII of Pagaram 2 Public Middle School Academic Year 2018/2019. The research method is the experimental method with the design of the pretest-posttest control group design. The sample of this study is class VIII E as the experimental class with the number of students that is 31 and that is 70.67 while the sample in the control class class VIII H with the number of students is 31 and that is 60.64. Data collection techniques used documentation and tests. The data analysis technique uses the t test. In the experimental class with a value of 70.67 and S which is 13.00 while in the control class that is 60.64 and S is 13.52, it is obtained tcount 3.1206 t table 1.701, then  $H_0$  is rejected  $H_a$  is accepted, meaning the research hypothesis is accepted. So Problem Beased Learning (PBL) Learning Model Using Bridge Cards Effectively Against Student Learning Outcomes In Opportunity Materials In Class VIII Pagaram 2 Public Middle School Academic Year 2018/2019

**Keywords:** Problem Beased Learning (PBL), Bridge Card



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E : [mercumatika@mercubuana-yogya.ac.id](mailto:mercumatika@mercubuana-yogya.ac.id)



## PENDAHULUAN

Probability Theory is a field of study in mathematics that allows us to provide a foundation for the development of models related to phenomena involving elements of uncertainty (Agusta, 2010). According to researcher Maulida (2015), probability is a branch of knowledge that studies uncertainty. It was originally developed from speculative games, such as card games and dice rolls, and was applied to determine the likelihood of winning a gambling game. Learning probability is very important. According to Dessy (2017), by studying probability, students can calculate the likelihood of events occurring in everyday life. Probability is necessary for solving problems in various fields such as meteorology, insurance, and industry (Maulida, 2015).

In reality, students only know or have learned about probability, but they do not fully understand or are unable to apply it in solving mathematical problems related to the topic. In fact, this topic is still considered difficult by students. According to Desty (2018), student learning outcomes on probability topics are still not satisfactory, as students remain confused about which method or strategy can help them solve problems. According to Eliyana (2014), in classroom instruction where the teacher dominates the learning process while students tend to be passive, this no longer aligns with the current educational paradigm in which students are not only objects of learning but also subjects. Efforts to make mathematics lessons enjoyable so that they are more liked by students include teacher attitudes, openness to learning, and the use of techniques or instructional media. The use of media is very important for teachers in helping to explain material to students more effectively and efficiently (Estiani, 2015).

According to Malinda (2017), each concept or principle in mathematics that is presented in a concrete form will be easier to understand. Learning that uses appropriate media will result in optimal outcomes in students' understanding of the material being studied. One of the learning media that can be used in teaching probability is bridge cards. According to Maslahah (2015), bridge cards are thick pieces of paper, usually rectangular in shape, consisting of 52 cards divided into four suits, each containing 13 cards. The 2013 Curriculum is designed to develop a balance between the development of spiritual and social attitudes, curiosity, creativity, collaboration, and intellectual and psychomotor abilities (Ministry of Education and Culture, 2013). According to Kusnadi (2014), in mathematics learning, the 2013 Curriculum is expected to enhance creative teaching and contribute to the society, nation, and state by equipping students with various competencies in terms of attitude, knowledge, and skills in accordance with the demands of civilization and the progress of the times.

The Problem-Based Learning (PBL) model is considered one of the most promising and relevant instructional approaches to be developed and applied in accordance with the demands of modern education, particularly within the framework of the 2013 Curriculum implementation in Indonesia (Sofyan, 2016). This curriculum emphasizes student-centered learning, critical thinking, and the development of 21st-century competencies, all of which align with the core principles of PBL. According to Ngalmun (2012:89), the PBL model is an innovative learning strategy that creates an environment in which students are actively engaged in constructing knowledge through meaningful problem-solving experiences. It enables learners to take responsibility for their own learning, work collaboratively, and reflect on the process, thereby fostering deeper understanding and the development of essential life skills.

Moreover, Abrory (2014) highlights the importance of teachers adopting effective, interactive, and engaging teaching strategies in order to maintain students' interest, prevent learning fatigue, and encourage high levels of motivation. When students perceive learning activities as relevant to their real-life experiences, they are more likely to invest effort and engage cognitively and emotionally with the material. This is particularly crucial in subjects like mathematics, which are often perceived as abstract and disconnected from everyday life. Teachers, therefore, must innovate continuously in both pedagogical approach and learning media to bridge this gap between academic content and real-world application.

Several studies have explored creative methods of teaching abstract mathematical concepts. For instance, Septy (2015) successfully utilized comic media to teach probability to eighth-grade students, offering a more visual and narrative-driven method of instruction. Comics, as a form of visual storytelling, helped students understand probability concepts through relatable scenarios and characters, making the content more accessible and less intimidating. Inspired by this line of

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inquiry, the current researcher adopts a different approach by using bridge cards as instructional media. This medium not only provides a tactile and engaging element to the learning process but also introduces an element of game-based learning that can make abstract concepts like probability more concrete and enjoyable.

Furthermore, the application of the PBL model in combination with engaging media has also been shown to contribute positively to various aspects of student learning. In a study conducted by Yanti (2017), the implementation of PBL was found to significantly improve the mathematical communication skills of junior high school students. These skills include the ability to explain reasoning, represent ideas using mathematical language, and interpret problems effectively—skills that are essential for academic success and everyday decision-making. In another study, Handayani (2016) demonstrated that the use of PBL not only increased student activity during lessons but also had a direct positive impact on students' mathematics learning outcomes. The model promoted an interactive and dynamic classroom atmosphere where students were encouraged to explore, question, and apply their knowledge collaboratively.

In summary, the Problem-Based Learning model, when combined with appropriate learning media such as bridge cards, holds significant potential to transform traditional mathematics instruction into a more engaging, student-centered, and meaningful learning experience. It aligns with national curriculum goals and addresses common challenges in mathematics education, such as low motivation and the perceived difficulty of abstract content. By creating a learning environment that is both intellectually stimulating and practically relevant, PBL can play a pivotal role in improving student outcomes and preparing learners to face complex real-world problems with confidence and competence.

Based on the explanation above, the author is interested in conducting a study titled: "The Effectiveness of the Problem-Based Learning (PBL) Model Using Bridge Cards on Student Learning Outcomes in the Probability Topic for Grade VIII at SMP Negeri 2 Pagaram in the 2018/2019 Academic Year."

## **METODE**

The data collected in this study were quantitative in nature, derived from mathematics learning outcome tests administered to eighth-grade students at SMP Negeri 2 Pagaram. These tests specifically focused on the topic of probability, with a particular emphasis on evaluating the effectiveness of using bridge cards as a teaching medium. The purpose of this instrument was to assess the level of students' understanding after they had been exposed to different teaching strategies: the Problem-Based Learning (PBL) model utilizing bridge cards in the experimental class and a conventional approach without bridge cards in the control class. The bridge card medium, consisting of a standard 52-card deck, was employed not merely as a tool for engagement, but as a concrete visual aid to help students grasp abstract concepts in probability. By using this medium, learning becomes more interactive, contextual, and relatable, particularly for students who struggle with symbolic mathematical representations.

The central goal of incorporating the bridge card medium was to determine whether it could enhance students' comprehension and thereby improve their learning outcomes. Following the implementation of the respective instructional models, the data revealed a significant difference in the performance of the two groups. The average score of the experimental class, which utilized the bridge cards alongside PBL strategies, was 70.67, while the control class, which relied on traditional instruction, scored an average of 60.64. This gap of 10.03 points highlights a substantial improvement in the experimental group. Statistical analysis further reinforced this finding, showing that the calculated t-value was 3.0216, while the t-table value at the 5% significance level was 1.701. Since the t-value exceeded the critical threshold, the null hypothesis ( $H_0$ )—which posited no difference between the two teaching methods—was rejected, and the alternative hypothesis ( $H_1$ ) was accepted. This outcome supports the conclusion that the PBL model with bridge card media has a statistically significant positive effect on student learning outcomes in probability.

Beyond the numerical results, the study also observed qualitative improvements in classroom dynamics and student engagement. The implementation of the PBL model fostered a learning environment that promoted active participation, critical thinking, and peer collaboration. Instead of passively receiving information, students in the experimental class were encouraged to engage in

discussions, pose questions, and work together to solve contextual problems using student worksheets (LKPD) designed to guide their thinking. This not only enhanced their conceptual understanding but also helped build communication and problem-solving skills—core competencies in 21st-century education.

Nevertheless, the initial adoption of the PBL model posed several challenges. Many students in the experimental class initially experienced confusion and discomfort due to their unfamiliarity with student-centered learning. Having been accustomed to conventional, teacher-centered instruction, they required time and guidance to adjust to this more interactive approach. To mitigate this, the teacher divided students into small collaborative groups and provided structured support through learning worksheets. These resources were intended to scaffold their learning; however, it was observed that some students were reluctant to read and instead preferred to seek direct assistance from the teacher. This behavior highlighted a potential obstacle in developing independent learning habits, underscoring the need for further encouragement and scaffolding.

The findings of this study affirm that the success of PBL is closely tied to the active engagement of students throughout the learning process. Several key factors must be in place to maximize its impact: consistent interaction among group members, a sense of individual responsibility, and effective collaboration within the group. Additionally, the role of the teacher as a facilitator—providing motivation, guidance, and reinforcement—is crucial in sustaining student interest and participation. When these components are implemented effectively, the PBL model, particularly when integrated with appropriate instructional media such as bridge cards, has the potential to become a powerful pedagogical strategy. It can significantly improve students' understanding of mathematical concepts, especially in abstract topics like probability, making learning more meaningful, enjoyable, and lasting.

## CONCLUSION

The Problem-Based Learning (PBL) model has proven to be effective in improving the mathematics learning outcomes of eighth-grade students at SMP Negeri 2 Pagaram. This can be seen from the comparison of learning outcomes between the experimental class, which implemented the PBL model with the aid of bridge card media, and the control class, which used conventional teaching methods without any such media. Based on the research findings, the average mathematics learning outcome in the experimental class was 70.67, while the control class scored an average of 60.64, with the Minimum Mastery Criterion (KKM) set at 65. The difference in average scores between the two classes, which was 10.03 points, indicates a significant improvement in the experimental class's learning outcomes.

To strengthen this finding, quantitative data analysis was conducted using a statistical test. The result of the t-test showed that the calculated t-value ( $t_{\text{hitung}}$ ) was 3.1206, while the critical t-value ( $t_{\text{tabel}}$ ) at a specific level of significance was 1.701. Since  $t_{\text{hitung}} > t_{\text{tabel}}$  the null hypothesis ( $H_0$ ) is rejected and the alternative hypothesis ( $H_a$ ) is accepted. Thus, it can be statistically concluded that the application of the Problem-Based Learning (PBL) model is significantly effective in enhancing students' learning outcomes in probability material. This effectiveness is achieved through a learning strategy that requires students to actively think, discuss, and solve problems in groups, supported by concrete media such as bridge cards that help students understand probability concepts in a more tangible and engaging way.

This success also reflects that student-centered learning approaches like PBL are better suited to meet the demands of 21st-century education, which emphasizes critical thinking, problem-solving, and collaboration skills. Therefore, the PBL model deserves consideration as an alternative mathematics teaching method that can increase student engagement, deepen conceptual understanding, and ultimately improve overall learning outcomes—particularly in topics that are often perceived as difficult, such as probability.

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