

The Influence of Role-Playing Method in Problem-Based Learning (PBL) Model on Students' Oral Communication Skills and Critical Thinking Abilities

Shintia Okta Anggraini^{a,1}, Harlita^{a,2,*}, Umi Fatmawati^{a,3}

^a Department of Biology Education, Faculty of Teacher Training and Education, Sebelas Maret University, Indonesia

¹ shintiaanggraini80@student.uns.ac.id; ² harlita@staff.uns.ac.id; ³ umifatmawati@staff.uns.ac.id

* Corresponding Author



Received October 18, 2025; accepted March 8, 2026; published March 31, 2026

ABSTRACT

The less than optimal oral communication and critical thinking skills of eleventh-grade students at SMA N 1 Boyolali are due to the tendency of learning methods that focus on memorizing textbooks or PowerPoint presentations provided by instructors. The application of the Problem-Based Learning (PBL) Model, when integrated with the role-playing method, presents a viable alternative for developing students' oral communication and critical thinking skills. This study aims to examine the impact of the role-playing method within the PBL framework on students' oral communication and critical thinking skills, both independently and simultaneously, in the context of reproductive system material. This study used an experimental design with a quantitative approach, specifically a quasi-experimental design that used cluster random sampling for sample selection. The sample consisted of eleventh-grade students as the control group and eleventh-grade students as the experimental group from SMA N 1 Boyolali with 37 students in each class. Data collection involved observation to evaluate oral communication skills and a post-test to assess critical thinking skills. Data analysis was conducted after testing for normality and homogeneity as prerequisites, with the help of SPSS version 30 software, followed by hypothesis testing using the independent t-test and MANOVA. The findings show that the role-playing method in the PBL model significantly influences students' oral communication skills and critical thinking skills both separately and simultaneously with the results of the t-test of 0.001 and the MANOVA test of 0.000 which is smaller than the significance of 0.05.

KEYWORDS

Critical thinking,
Oral communication,
PBL,
Role playing

This is an open
access article
under CC-BY-
SA license



1. Introduction

Entering the 21st century the world has entered the Industrial Revolution 4.0 era characterized by globalization, information transparency and the rapid development of digital technology. The integration of technologies such as the Internet of Things (IoT), artificial intelligence (AI), and automation has made work processes faster, more efficient, and more productive. Therefore the 21st century is known as the knowledge age, emphasizing the importance of quality education and mastery of hard and soft skills so that individuals can adapt and compete globally (Fernandes, 2019; Pradita & Sidik, 2020). One of the skills needed in this era is communication skills. This skill is crucial for individuals to facilitate effective collaboration, idea sharing and leadership in an increasingly complex work environment (Suleman, 2024). In addition to communication skills students must also develop critical thinking skills characterized by a high level of curiosity, a growing imagination, a willingness to face differences, a readiness to take risks and respect for the rights, guidance and direction of others. Ennis (2011) defines critical thinking as a reflective thought process that focuses on how individuals make decisions about what to believe, act and be accountable for fairly. This skill is crucial because individuals with strong critical thinking skills can reason logically, solve problems effectively and make rational decisions regarding their actions or beliefs (Susilawati et al., 2020).

The Problem-Based Learning (PBL) model is a problem-solving approach that helps students develop critical thinking skills, find solutions independently and build meaningful understanding (Novianti & Lestari, 2024). Through collaborative learning, students are required to work together to solve problems related to everyday life. The stages of PBL include problem orientation, organizing learning activities, individual and group investigations, compiling and presenting results and analyzing and evaluating the problem-solving process (Arends, 2012). Problem-Based Learning (PBL) places students in situations where they solve complex real-world problems, rather than simply receiving material from the teacher. In this process students must communicate verbally to identify problems, discuss in groups, convey analytical results and defend arguments (Dilonia et al., 2025).

Research conducted by Azizi (2019) states that the PBL model is effective in improving students' problem-solving abilities, especially in Biology learning. The effectiveness of PBL can be increased through integration with other methods that encourage logical, scientific, active thinking and build students' self-confidence, and discipline. One method that can be combined with PBL is role-playing which is the activity of playing a certain role to reconstruct past events, describe current situations or simulate various possibilities in the learning context (Azizi, 2019). In another study by Simanulang et al., (2024) the role-playing method is able to create an active, interactive and enjoyable learning atmosphere so that it can increase students' interest in learning. The PBL method with role-playing according to a literature study conducted by Latifah and Priantari (2024) is stated to increase self-confidence, the ability to work together and problem-solving skills. The integration of role-playing within the Problem-Based Learning (PBL) model is considered effective in developing critical thinking skills, decision-making, openness to new experiences and student creativity in solving problems, particularly in Biology learning, where some materials contain abstract concepts such as the life cycle of organisms. Role-playing helps students visualize abstract concepts by playing characters or objects within the context of the material (Putri & Saputro, 2025).

Initial observations conducted at a high school in Boyolali indicate that students' communication and critical thinking skills need to be improved and facilitated because the learning model used is still dominated by teacher-centered and monotonous methods. This method is considered to limit student engagement and result in students relying solely on memorization, especially for subjects with abstract and complex concepts such as biology. One effort that can be made to improve students' communication skills is the implementation of PBL integrated with role-playing. The PBL model with role-playing is suitable for Biology content, where the learning method will be more visual and provide an overview and understanding of the flow that tends to be abstract, such as in the reproductive system material. Through the PBL method with role-playing, it is hoped that students will be able to collaborate, share information, and solve problems collectively, thereby improving communication skills. The combination of role-playing with PBL actively engages students in developing communication skills through verbal and nonverbal actions, resulting in a dynamic learning process. In addition, role-playing engages students' auditory, visual, written, and kinesthetic modalities.

Based on the description, it can be seen that oral communication skills and critical thinking skills are important competencies that students must possess in 21st-century learning. Various studies have proven that the Problem-Based Learning model is effective in improving critical thinking and problem-solving skills (Azizi, 2019), while the role-playing method has been proven to increase students' activeness, self-confidence, and communication skills (Simanullang et al., 2024). Other studies also report that integrating role-playing into problem-based learning has the potential to increase creativity and problem-solving skills (Latifah & Priantari, 2024). However, most of these studies still examine the effects of the two approaches separately or only focus on one learning outcome such as learning outcomes, problem-solving skills, or critical thinking. Research that specifically integrates role-playing into the syntax of Problem-Based Learning to examine its simultaneous effects on oral communication skills and critical thinking skills in Biology learning, especially the Reproductive System material at the high school level, is still very limited. Therefore, this study aims to fill this gap by evaluating the effectiveness of PBL-role-playing integration in developing two 21st-century competencies simultaneously in the context of Biology learning. The current study will be conducted with the title "The Effect of Role-Playing Methods in Problem-Based Learning (PBL) Models on Students' Oral Communication Skills and Critical Thinking Abilities."

2. Method

This study is a quantitative study with a quasi-experimental design involving treatment, impact measurement, and experimental units but does not apply random assignment to compare changes caused by treatment (Abraham & Supriyati, 2022). The experimental method was chosen to determine the cause-and-effect relationship between variables X and Y. The posttest-only nonequivalent control group design was chosen because the study aimed to compare the final results of oral communication skills and critical thinking skills between groups that received Problem Based Learning (PBL) learning integrated with role-playing methods with groups that received PBL learning alone. Measurements were only carried out after the treatment was given (post-test) so that the results of the study were expected to reflect the direct effect of the treatment and minimize the testing effect, namely the influence of the pretest on the student's learning process. The use of this design has also been applied in experimental research in the

field of education, especially in research that evaluates the effectiveness of the Problem Based Learning learning model on students' thinking and communication skills, such as research (Salari et al., 2018, Susanti et al., 2020).

The post-test questionnaire was structured into two case studies: 1) an example of abnormal menstruation and 2) a case study of molar pregnancy. Each of these two case studies consisted of six essay questions based on indicators of interpretation, analysis, inference, evaluation, explanation, and self-regulation. The instrument was administered to respondents after undergoing content and construct validity testing by a lecturer from the Faculty of Teacher Training and Education at UNS as an expert validator. All data collection tools, including the post-test instrument grid, teaching modules, student worksheets, and materials used to assess oral communication and critical thinking skills, were also validated by the same validator. Furthermore, the 12 post-test questions were also validated using the SPSS application program, which was declared to have passed with a significance value of less than 0.05.

SMA Negeri 1 Boyolali is a public high school under the auspices of the Central Java Provincial Government. This school is located at Jalan Kates Number 8, Siswodipuran Village, Boyolali District, Boyolali Regency, Central Java Province. The study was conducted on eleventh-grade students who had received reproductive system material in Biology lessons. The total number of classes at the eleventh grade is 5 classes, then two classes were selected, namely class XI-1 as the control class and class XI-3 as the experimental class with a total of 36 students each. The sampling technique used cluster random sampling where the selection of the control class and the experimental class was done randomly. This technique was chosen because the population was class XI who received the same Biology lesson. Respondents were eleventh-grade students at SMA N 1 Boyolali with the same age range of 16-17 years at the time of the study. Meanwhile, if viewed from the gender of the control class and the experimental class can be seen in the following table 1.

Table 1. Frequency distribution of respondent characteristics by gender.

<i>Class Category</i>	<i>Criteria</i>	<i>Frequency</i>	<i>Percentage (%)</i>
Control Class	Man	12 Students	33.3
	Woman	24 Students	66.7
Total Control Class		36 Students	100
Experimental Class	Man	14 Students	38.9
	Woman	22 Students	61.1
Total Experimental Class		36 Students	100

Based on the data in Table 1 above, it is known that both the control and experimental classes were dominated by female students. Prerequisite testing of the research data was conducted using the Shapiro-Wilk normality test and Levene's homogeneity test using SPSS 30 software to determine its feasibility. After the data was declared feasibility, hypothesis testing was continued using the independent t-test and MANOVA.

3. Results and Discussion

3.1. Results

3.1.1 Data Critical Thinking Skills

Students' critical thinking skills were measured using a post-test at the end of the learning process. The distribution of post-test scores in the control and experimental classes is presented in Table 2.

Table 2. Distribution of post-test scores for critical thinking skills.

<i>Category</i>	<i>Hose</i>	<i>Control Frequency</i>	<i>Control %</i>	<i>Trial Frequency</i>	<i>Test %</i>
Very high	81-100	13	36.1	20	55.5
Tall	61-80	13	36.1	13	36.1
Currently	41-60	10	27.8	3	8.4
Low	21-40	0	0	0	0
Very Low	< 20	0	0	0	0

Table 2 shows that the control class had the highest frequency in the 81-100 interval, with 13 students. The experimental class had the same highest interval (81-100) but with a higher frequency, namely 20 students. The comparison of the average student scores on each critical thinking indicator according to Facione (2015) between the control and experimental classes is shown in Figure 1.

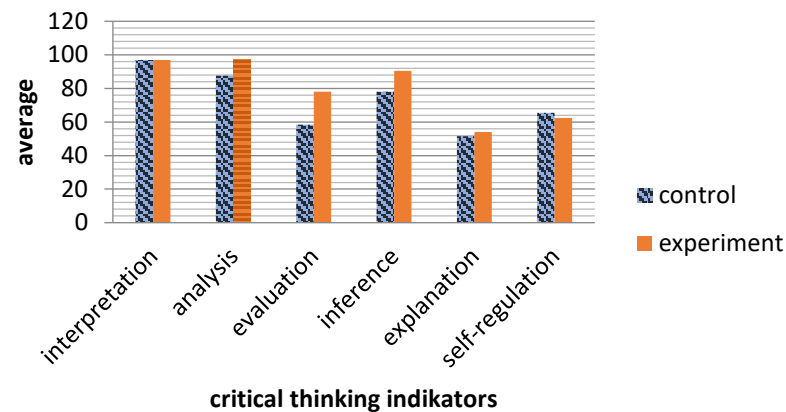


Figure 1. Histogram comparing the mean scores for each critical thinking indicator.

Figure 1 illustrates that the experimental class generally achieved higher average scores than the control class on most critical thinking indicators. The explanation indicator was the most difficult to answer, with an average score of 54 for the experimental class and 51.5 for the control class. The interpretation and analysis indicators were the easiest, with the experimental class scoring an average of 97 on both indicators, while the control class scored 97 for interpretation and 87.5 for analysis. On the inference indicator, the experimental class achieved a very high category with an average of 90.5, higher than the control class which scored 78. The evaluation and self-regulation indicators were achieved by several students, with the experimental class scoring an average of 78 for evaluation and 62.5 for self-regulation, while the control class scored 58.5 and 65.5, respectively.

3.1.2 Oral Communication Skills Data

Students' oral communication skills were assessed through observations during the learning process. Observations were conducted by three observers from the Biology Education program. The distribution of oral communication skills observation results in the control and experimental classes is presented in Table 3.

Table 3. Distribution of oral communication assessment data

Category	Hose	Control Frequency	Control %	Trial Frequency	Test %
Very high	81-100	0	0	7	19.5
Tall	61-80	8	22.2	25	69.3
Currently	41-60	25	69.5	4	11.2
Low	21-40	3	8.3	0	0
Very Low	< 20	0	0	0	0

Table 3 shows that the control class had the highest frequency in the 41-60 interval, with 25 students. The experimental class had the highest frequency in the 61-80 interval, with 25 students. The comparison of the average student scores on each oral communication indicator according to Crebert et al. (2011) between the control and experimental classes is shown in Figure 2.

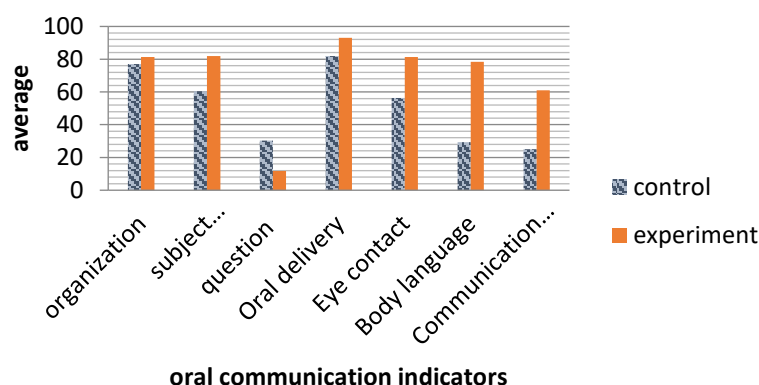


Figure 2. Histogram comparing the average scores for each indicator of oral communication skills based on observation results.

The average scores of the experimental class in Figure 2 were almost always higher than those of the control class in almost all categories. For the questioning indicator, the control class had a higher average score (30.4) compared to the experimental class (11.75), although only a few students met this indicator. For the use of visual aids indicator, the experimental class showed a high average score (61 points), while the control class had a low score (25 points). Most students in the experimental class used visual aids to support group presentations, in contrast to the control class.

3.1.3 Hypothesis Test Results

The results of the hypothesis testing were obtained from the normality and homogeneity tests, followed by independent t-tests and MANOVA using SPSS 30 software. The normality test for the post-test data of critical thinking skills in the control and experimental groups showed a significance value of 0.054 for the control group and 0.075 for the experimental group, with $p > 0.05$. Thus, it can be concluded that both data sets are normally distributed. The normality test for the oral communication skills data in both groups showed a significance value of 0.137 for the control group and 0.211 for the experimental group, with $p > 0.05$, indicating a normal data distribution. The homogeneity test for the data of critical thinking skills and oral communication skills showed a significance value greater than 0.05, meaning that the data variance in both groups was similar (homogeneous). The results of the post-test tested with an independent t-test are presented in Table 4.

Table 4. Independent t-test results for post-test scores of students' critical thinking skills.

	<i>T</i>	<i>df</i>	<i>p one side</i>	<i>Two sides of p</i>
Equal variances assumed	-2,044	70	0.022	0.045
Equal variances are not assumed	-2,044	63,329	0.023	0.045

Table 4 shows that the independent t-test of the post-test results showed a two-tailed significance value of 0.045, where $\alpha = 0.05$. Therefore, it can be concluded that there is a significant effect of the use of role-playing methods in the PBL model on critical thinking skills. Observational data tested with the independent t-test are presented in Table 5.

Table 5. Independent t-test results for students' oral communication skills.

	<i>T</i>	<i>df</i>	<i>p one side</i>	<i>Two sides of p</i>
Equal variances assumed	-10,098	70	< 0.001	< 0.001
Equal variances are not assumed	-10,098	69,579	< 0.001	< 0.001

Table 5 shows that the independent t-test of observational data yields a significance value of less than 0.001, with $\alpha = 0.05$. Therefore, it can be concluded that there is a significant effect of the use of the role-playing method in the PBL model on oral communication skills between the control group and the experimental group.

The research prerequisite test was carried out through a normality test (Shapiro-Wilk) and a homogeneity test (Levene's Test) with the following results (Table 6).

Table 6. Shapiro-Wilk normality test results

Category	Sig Value	Criteria sig.>0.05
Control	0.054	Normal
Experiment	0.075	Normal

Table 6 shows the results of the normality test for the post-test data from the control and experimental classes to determine students' critical thinking skills. Both classes' data showed a sig value >0.05, indicating that both data were classified as normal. The Shapiro-Wilk normality test was also applied to the observation data for oral communication skills. The results of the homogeneity test can be seen in Table 7 below:

Table 7. Results of Levene's Test of homogeneity

Category	Sig Value	Criteria sig.>0.05
Control	0.054	Normal
Experiment	0.075	Normal

To test the simultaneous effect of the use of role-playing methods in the PBL model on critical thinking skills and oral communication skills, a MANOVA test was conducted. The results of the MANOVA test on critical thinking skills and oral communication skills from observation data are presented in Table 8.

Table 8. MANOVA test results for oral communication and critical thinking

Influence	Mark	F	Signature.
Pillai's Trail	0.594	50.382b	< 0.001
Lambda Wilks	0.406	50.382b	< 0.001
Hotelling's Trail	1,460	50.382b	< 0.001
Roy's Biggest Root	1,460	50.382b	< 0.001

The observed critical thinking skills and oral communication skills showed a significance value of less than 0.001, where $p < 0.05$, which indicates that the PBL model combined with the role-playing method has a significant influence on students' critical thinking skills and oral communication skills.

3.2 Discussion

3.2.1 The Effect of Role Playing on Critical Thinking Skills

Based on the research results, it can be concluded that the application of the Problem Based Learning (PBL) model combined with role-playing methods has a significant effect on students' critical thinking skills in the material on reproductive system disorders. The results of the independent sample t-test showed a significance value of less than 0.05, indicating a meaningful difference in critical thinking skills between the experimental and control classes. The combination of PBL and role-playing provides better results on most critical thinking indicators according to Facione (2015), namely analysis, inference, evaluation, and explanation. This improvement occurs because learning not only requires students to solve problems systematically through the PBL stages but also provides opportunities for students to construct knowledge through role-playing simulations, discussions, arguments, and decision-making in situations that resemble real life.

Based on the test scores of the analysis indicators, the experimental class had a higher average score (97) than the control class (87.5), both in the very high category. PBL begins learning by presenting relevant and complex problems about reproductive system disorders, encouraging students to dissect information, identify, and connect biological concepts critically (Karyani et al., 2021). The application of role-playing in the experimental class improves analytical skills because students face real-life situations that must be analyzed from various perspectives to make decisions, thus training their skills to evaluate arguments and connect concepts critically (Relita, 2015).

For the inference indicator, the experimental class showed a very high average (90.5) compared to the control class (78). In general, students were able to identify and provide relevant evidence to draw conclusions. However, many students in the control class struggled to provide evidence that supported their arguments, consistent with Rahayu et al. (2020), who found that although students could make claims, they struggled to support them with appropriate data. In contrast, the experimental class showed

a very high average on this indicator because role-playing helped students connect facts, develop arguments, and logically draw conclusions from information through interaction and dialogue during learning (Heward et al., 2018).

For the evaluation indicator, the experimental class achieved a high average score (78), better than the control class (58.5). In this indicator, many students still hold beliefs rooted in culture, myths, and a lack of scientific information, so they tend to accept information without critical reflection or verification. Nadirahilah & Fitriyani (2024) stated that myths about menstruation are still believed by many adolescents. Through role-playing, students actively participate in simulations of real-life situations that require evaluating decisions, arguments, and consequences, thus training their ability to assess the truth, relevance, and logic of information (Hartati et al., 2012).

The explanation indicator showed a slightly higher average in the experimental class (54) compared to the control class (51.5) regarding providing reasons and evidence for answers. Some students were able to provide reasons and evidence in problem-solving, but many still struggled due to a lack of knowledge about the function of reproductive organs and hormones, including the menstrual cycle. This made it difficult for them to provide strong scientific explanations (Pangestu et al., 2023). In the experimental class, the higher average explanation was due to the role-playing that encouraged active interaction and argumentation in the simulation, allowing students to develop verbal arguments. However, the focus on social simulations made contextual evidence and detailed procedural corrections less optimal (Apriyanti et al., 2024).

For self-regulation indicators, the control class had a slightly higher average (65.5) than the experimental class (62.5). Most students were able to analyze daily habits that can be changed to prevent reproductive system infections and evaluate steps to verify a statement. This is supported by the PBL learning approach, which connects material to everyday life through interactive media, case studies, and group discussions, leading to deeper and more applicable understanding (Syahdiani et al., 2017). However, the average self-regulation indicator in the control class was higher than in the experimental class because role-playing emphasized social interaction and direct experience rather than in-depth self-reflection, resulting in relatively lower self-regulation improvements (Marita & Amanati, 2017).

3.2.2 The Effect of Role Playing on Oral Communication Skills

The results of the two-tailed independent t-test showed a significance value of $p < 0.001$, which indicates a significant effect of the use of the PBL model combined with role-playing on oral communication skills. Differences were observed in each indicator as follows: For the organization indicator, the experimental class excelled with an average score of 81.25 (very high) compared to the control class which had a score of 77 (high). Both groups had relatively high average scores because students were able to elaborate ideas and organize information logically and creatively. The superiority of the experimental class related to role playing comes from students who are required to understand the context, organize information according to their roles, and convey messages coherently (Krisdiana & Kadarisman, 2018).

On the subject knowledge indicator, the experimental class achieved an average score of 82 (very high), outperforming the control class, which scored 60.5 (high approaching medium). The experimental group had a higher average because most of its members had accurate, detailed, relevant, and easy-to-understand information. The use of role-playing helped improve experimental class students' understanding of the reproductive system material. In role-playing, students are also responsible for understanding the topic to be presented to the audience (Rochmayani, 2017). For the question indicator, the control class scored higher (30.4) than the experimental class (11.75) because more time in the control class was dedicated to question-and-answer sessions, while the experimental class spent more time preparing for role-playing. This is in line with the view that role-playing requires extensive preparation and optimal time management to ensure all activities run smoothly without reducing time for other learning aspects (Luturmas, 2020).

In terms of oral delivery, the experimental class excelled with an average score of 93 (very high), compared to the control class, which scored 82 (very high). Role-playing in the experimental class improved oral delivery due to the use of intonation and expression to portray character roles, which also trained students' confidence to appear and speak more confidently. The role-playing method can increase self-confidence and give students the freedom to express their opinions (Haliza & Nugrahani, 2021). For eye contact, this indicator showed that the experimental class had an average score of 81.25 (very high), better than the control class, which had a score of 56.25 (moderate). Eye contact in the experimental class was very high because role-playing encouraged students to interact directly and communicatively, getting them used to making eye contact to convey messages and understand audience reactions (Rahmah & Nasution, 2024). This eye contact builds connection and confidence, allowing students to

speak more confidently and use language freely, which is important for practicing and improving effective speaking skills (Yulianeta et al., 2024).

The body language indicator in the experimental class averaged 78 (high), far exceeding the control class average of 29.25 (low). Role-playing helps students use expressions and gestures to support verbal communication. The PBL model without role-playing only emphasizes verbal delivery, so students are less trained to communicate using facial expressions or gestures (Khalid & Syafri, 2023). For the communication aids indicator, the experimental class averaged 61 (high), significantly higher than the control class's 21 (low). Students in the experimental class were skilled at using aids such as name tags, organ diagrams, and stage settings to clarify their messages (Rahmah & Nasution, 2024).

Overall, the implementation of the PBL model combined with role-playing effectively improved students' oral communication skills compared to conventional learning methods in the control class. Role-playing requires students to interact and communicate actively in simulated situations, enabling them to optimally utilize communication tools to clarify and strengthen their messages (Rahmah & Nasution, 2024; Kusumadani et al, 2025; Khoirunnisa et al, 2024).

3.2.3 The Effect of PBL Combined with Role Playing on Oral Communication and Critical Thinking Skills Simultaneously

The MANOVA test results with a significance value <0.001 indicate that the PBL learning model combined with role-playing has a significant influence on students' critical thinking skills and oral communication skills. PBL emphasizes case studies that train critical thinking, while role-playing improves oral communication skills. This significant difference in critical thinking skills is in line with the findings of Herzon et al. (2017), who stated that PBL is effective in improving critical thinking skills. In addition, role-playing is effective in developing the ability to speak, listen, understand, and respond appropriately to conversations, as explained by Yulianeta et al. (2024).

4. Conclusion

The results of the study indicate that the role-playing method in the PBL model influences oral communication skills and critical thinking skills, both separately and simultaneously. The Problem-Based Learning (PBL) model has been proven effective in improving students' critical thinking skills because the PBL syntax trains students to engage in higher-order thinking processes, including critical thinking. PBL combined with role-playing can improve oral communication skills such as listening, understanding, and responding effectively to conversations. Overall, the research results show that the integration of the Problem Based Learning (PBL) model with the role-playing method is effective in improving students' critical thinking skills, especially in the aspects of analysis, inference, evaluation, and explanation. Theoretically, this finding strengthens the constructivist theory that learning centered on problem solving and active interaction can develop students' critical thinking skills. Pedagogically, the combination of PBL and role-playing can be an alternative for more active, contextual, and student-centered Biology learning, especially on material related to real-life problems. For further research, it is recommended to test the application of this model on different materials or educational levels and examine its impact on other 21st-century skills, such as creativity, communication, collaboration, and metacognition.

Theoretically, the results of this study enrich the study on the effectiveness of the Problem Based Learning (PBL) model combined with role-playing in improving students' critical thinking skills. Practically, these findings can be a consideration for teachers, especially in Biology learning, to apply the combination of PBL and role-playing as an alternative to more active and contextual learning. For further research, it is necessary to develop research on the combination of the Problem Based Learning model with the role-playing method in different materials or educational levels and examine their simultaneous effects on students' critical thinking skills and oral communication skills so as to provide a broader contribution to the development of 21st-century learning strategies.

Reference

- Abraham, I., & Supriyati, Y. (2022). Quasi-experimental design in education: Literature review. *Jurnal Ilmiah Mandala Education*, 8(3), 2476–2482. <https://doi.org/10.58258/jime.v8i3.3800>
- Arends, R. I. (2012). *Learning to teach* (9th ed.). McGraw-Hill.
- Azizi, A. (2019). Implementasi problem based learning (PBL) dengan bermain peran (BP) terhadap kemampuan memecahkan masalah. *JUPE: Jurnal Pendidikan Mandala*, 4(5). <https://doi.org/10.58258/jupe.v4i5.855>
- Crebert, G., Patrick, C. J., Cragolini, V., Smith, C., Worsfold, K., & Webb, F. (2011). *Oral communication toolkit*. Griffith University.
- Dilonia, A., Melki, R. A., & Gusmaneli. (2025). Strategi pembelajaran inovatif untuk meningkatkan kemampuan berpikir kritis peserta didik. *Inovasi Pendidikan dan Anak Usia Dini*, 2(2), 7–24. <https://doi.org/10.61132/inpaud.v2i2.232>
- Ennis, R. H. (2011). Critical thinking: Reflection and perspective part II. *Inquiry: Critical Thinking Across the Disciplines*, 26(2), 5–19.
- Facione, P. A. (2015). *Critical thinking: What it is and why it counts*. Insight Assessment. <https://www.insightassessment.com>
- Fernandes, R. (2019). The relevance of the 2013 curriculum to the needs of students in the era of Revolution 4.0. *Socius: Jurnal Penelitian Ilmu-Ilmu Sosial*, 6(2), 70–80. <https://doi.org/10.24036/scs.v6i2.157>
- Haliza, R. N., & Nugrahani, R. F. (2021). The effect of role play method on students' self-confidence. *Psikodinamika: Jurnal Literasi Psikologi*, 1(2), 133–142.
- Hartati, T., Widiyanto, & Oktarina, N. (2012). Application of role playing learning model in improving economics learning outcomes. *Economic Education Analysis Journal*, 1(1), 1–6.
- Herzon, H. H., Budijanto, & Utomo, D. H. (2018). The effect of problem-based learning (PBL) on critical thinking skills. *Jurnal Pendidikan: Teori, Penelitian, dan Pengembangan*, 3(1), 42–46.
- Heward, J., Stone, L., Paddick, S.-M., Mkenda, S., Gray, W. K., Dotchin, C. L., Kissima, J., Collingwood, C., Swai, B., & Walker, R. W. (2018). A longitudinal study of cognitive decline in rural Tanzania: Rates and potentially modifiable risk factors. *International Psychogeriatrics*, 30(9), 1333–1343. <https://doi.org/10.1017/S1041610217002861>
- Khalid, I., & Syafri, R. A. (2023). Problem-based learning (PBL) model to improve student activeness and learning outcomes in service management courses. *Indonesian Educational Administration and Leadership Journal (IDEAL)*, 5(2), 30–45. <https://doi.org/10.22437/ideal.v5i2.28733>
- Khoirunnisa, R., Nugroho, A. A., & Hanik, N. R. (2024). Penerapan Model Problem Based Learning dengan Socioscientific Issues untuk Meningkatkan Keterampilan Berpikir Kritis pada Pembelajaran Biologi SMA. *FLOREA Vypedume.ru: Universitas PGRI Madiun*, 10(1), 17–24.
- Krisdiana, B. P., Irawati, E., & Kadarisman, A. E. (2018). The effectiveness of role-play integrated with word cards on students' speaking skill for communication. *Jurnal Pendidikan Humaniora*, 6(2), 78–84. <https://doi.org/10.17977/um030v6i22018p078>
- Kusumadani, A. I., Nabila, A. F., & Najwa, N. (2025). Comparison of the Learning Outcomes in the Ecology Course Using Socio-Scientific Problem based Learning and Stimulus Environment Problem Solving Models. *Journal of Biology Learning*, 7(1), 24–30. <https://doi.org/10.32585/jbl.v7i1.6435>
- Latifah, N., & Priantari, I. (2024). Implementation of the role playing method to achieve independent learning. *Journal of Educational Technology*, 1(4). <https://doi.org/10.47134/jtp.v1i4.94>
- Luturmas, N. (2020). Role play, games, and simulations are effective in increasing knowledge and positive attitudes of students of SMPN 4 and SMPN 10 Ambon towards premarital sexuality. *Molucca Medica*, 12, 19–24. <https://doi.org/10.30598/molmed.2019.v12.i2.19>
- Marita, R. A. S., & Amanati, S. (2017, May). The effect of role playing method on habits of mind ability of physiotherapy students. In *Proceedings* (Vol. 1, No. 1).
- Nadirahilah, N., & Fitriyani, L. (2024). Menarche experiences in early adolescent girls. *Jurnal Kesehatan Tambusai*, 5(2), 5231–5236.
- Novianti, A. B., & Lestari, N. A. (2024). Efektivitas model problem-based learning dalam meningkatkan kemampuan pemecahan masalah peserta didik pada desain rumah anti panas. *Jurnal Review Pendidikan dan Pengajaran*, 7(4), 14782–14787.
- Pangestu, A. M., Hidayat, N., & Musnandar, R. R. (2023). Development of an e-booklet on the hormonal system as a teaching material to improve learning outcomes. *Al Kawmu: Science and Local Wisdom*

- Journal*, 2(2), 171–177. <https://doi.org/10.18592/ak.v2i2.9274>
- Pradita, S. M., & Sidik, H. (2020). Utilization of internet-based history learning media in 21st century universities. *Literasi*, 2(2), 115–122. <https://doi.org/10.37010/lit.v2i2.81>
- Putri, C. A., & Saputro, S. D. (2025). Pengaruh model pembelajaran PBL pada materi perkembangan teknologi terhadap pengambilan keputusan siswa. *Journal of Education and Informatics Research*, 6(1).
- Rahayu, Y., Suhendar, S., & Ratnasari, J. (2020). Students' argumentation skills on motion system material in senior high schools in Sukabumi Regency, Indonesia. *Biodik*, 6(3), 312–318. <https://doi.org/10.22437/bio.v6i3.9802>
- Rahmah, M. F., & Nasution, S. (2024). The effect of role playing model on students' communication skills in elementary school. *ELSE (Elementary School Education Journal)*, 8(3). <https://doi.org/10.30651/else.v8i3.23870>
- Relita, D. T. (2015, November). Application of role playing method to students' critical thinking skills in economics subject (Experimental study in Class X of Panca Setya Sintang High School). In *Seminar Nasional Pendidikan Ekonomi & Bisnis* (pp. 1–7).
- Rochmayani, D. S. (2017). Role play method through peer educators to improve adolescent reproductive health knowledge in elementary schools. *Journal of Health Education*, 2(1), 25–32.
- Salari, M., Roozhbehi, A., Zarifi, A., & Tarmizi, R. A. (2018). Pure PBL, hybrid PBL and lecturing: Which one is more effective in developing cognitive skills of undergraduate students in pediatric nursing course? *BMC Medical Education*, 18, Article 195. <https://doi.org/10.1186/s12909-018-1305-0>
- Susanti, P. I., Agung, A. A. G., & Wulandari, I. G. A. A. (2020). The effect of the inside outside circle model assisted by video media on mathematics learning activity. *Jurnal Ilmiah Pendidikan Profesi Guru*, 3(1).
- Susilawati, E., Agustinasari, A., Samsudin, A., & Siahaan, P. (2020). Analysis of high school students' critical thinking skills. *Jurnal Pendidikan Fisika dan Teknologi*, 6(1), 11–16. <https://doi.org/10.29303/jpft.v6i1.1453>
- Syahdiani, S., Kardi, S., & Sanjaya, I. G. M. (2017). Development of inquiry-based interactive multimedia on human reproductive system material to improve learning outcomes and train students' critical thinking skills. *JPPS (Jurnal Penelitian Pendidikan Sains)*, 5(1), 727–741. <https://doi.org/10.26740/jpps.v5n1.p727-741>
- Yulianeta, Y., Faisol, M., & Hazarika, A. (2024). Is the use of role play as a method to improve students' speaking skills effective? *Journal of Classroom Action Research*, 1(3), 189–194.