

## The Effectiveness of PBL Model Assisted by Prezi Media on Students' Critical Thinking Ability and Concept Understanding

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### Abstract

Combining strategies, approaches, methods, and learning material is characteristic of today's learning models innovation. This study aims to (1) determine the validity of the PBL model supported by Prezi Media in Social Studies instruction and (2) determine the effectiveness of the PBL model assisted by Prezi Media on students' critical thinking abilities and conceptual knowledge. This research used a quasi-experimental approach with a Nonequivalent Control Group. The study was done in two schools, with the experimental class being 2 Kaliajir Primary School and the control class being 3 Petir Primary School. The data-gathering technique employed was an observation, description, and a short entry test. The data analysis technique was a prerequisite test for conducting research, including the normality and homogeneity tests. Meanwhile, hypothesis testing using expert validators, independent sample t-test, and N-Gain test were performed. The findings indicated that (1) the PBL model enhanced by Prezi media was valid for application in Social Studies education, and (2) the PBL model enhanced by Prezi media improved students' critical thinking skills and conceptual understanding. The study concludes that the PBL model, aided by Prezi media, is appropriate for social studies education and effect on students' critical thinking abilities and conceptual knowledge.

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## INTRODUCTION

Education attempts to help every human to realize their potential via learning. The existing national education system must provide competent human resources (HR). Quality education is required to prepare quality human resources. The difficulties of education nowadays are the learning process and students' cognitive capacities. Because modern education is still teacher-centered, students become passive, bored, and apathetic (Rawung, 2019). Because classroom learning tends to focus on memorizing data, students are driven to memorize information without being taught how to use it in everyday life. It affects students' understanding of concepts. Lapase (2021) also remarked that the teacher's explanation of the content was unclear because it was delivered too quickly and failed to capture the students' attention.

Effective learning techniques and needs enable students to reach their full potential while being adaptable to changing space and time constraints (Kurnianto & Rahmawati, 2020). Students' potential during the learning process is critical for developing a personality compatible with educational aims. The teacher no longer dominates a good learning process. The instructor's duty is not limited to imparting knowledge to students; the instructor also serves as a facilitator, facilitating chances for students to engage in active learning, express their viewpoints, and engage in enjoyable learning. (Surya & Arty, 2020). According to Chan and Lai (1995), the teacher must establish an environment that promotes students to use effective learning strategies and enables students to access the best knowledge possible.

According to observations conducted in fourth-grade at Primary School of Ki Hajar Dewantara cluster, Purwanegara District, Banjarnegara Regency, various difficulties were encountered by instructors and students during the implementation of the 2013 curriculum. The classroom teaching of social studies was dominated by direct teaching methods, resulting in poor student participation and boredom. During field observations, students tended to

accept the teacher's material and rarely asked questions beyond the handbook or those that develop from their critical minds after learning. Problems with students' concepts understanding and critical thinking abilities affect students' social studies learning outcomes.

The phenomena in this subject are incompatible with the educational demands of the twenty-first century. Kurnianto et al. (2019) explained that entering the twenty-first century, which is comparable with the advancement of science and technology, necessitates the development of all aspects of life, including education.

Additionally, Wechsler et al. (2017) argued that the emphasis on creativity, critical thinking, problem-solving, and decision-making in many countries is a vital component of improving the education system for the twenty-first century. Critical thinking is one of the skills required in the twenty-first century. Based on these abilities, it is vital to think critically and integrate technology developed for students.

Based on the identified issues, it is necessary to innovate social studies learning by using diverse learning strategies, providing easy-to-understand educational materials, and creating enjoyable learning environments. According to Dewi & Hilman (2018), updating the learning approach and using technology can increase learning effectiveness. According to this, researcher proposes use of the Problem Based Learning (PBL) approach with Prezi material to facilitate successful learning.

According to Cordeanita et al. (2019), PBL is a type of learning that focuses on cognitive thinking abilities and problem-solving mental processes in everyday life. According to Arends, as cited by Riswari et al. (2018), the PBL model is also a type of learning that provides students with multiple authentications and practical problem-solving solutions. Komar et al. (2020) explained that PBL model will assist students in processing difficulties through problem-solving activities during the learning process, hence improving learning outcomes. Student learning outcomes encompass a range of behavioral changes that occur due to learning, including

cognitive, emotional, and psychomotor outcomes.

Advanced technologies accelerate the pace of progress in the twenty-first century. Teachers should educate their students on the need for technological literacy. According to Barti (2020), 21st Century Learning should no longer be conducted conventionally but rather should foster students' ability to think. Cintang (2017) asserted that teachers must constantly update their knowledge and adapt to new trends in learning through the use of technological advancements in instructional activities. Obaydullah (2019) explains that technology is essential in elementary schools because it can enhance 1) learning experiences, 2) learning, and 3) curriculum enrichment. Thus, learning through ICT can improve the effectiveness and efficiency of learning.

According to the definition above, teachers must integrate ICT-assisted learning media that engage students to participate in the learning process to make learning enjoyable. Additionally, the usage of learning media can assist students in accelerating their comprehension of learning material by clarifying the presentation of information that will be delivered to them by the teacher. As a result, Diputra (2016) finds that the usage of multimedia can present the 2013 curriculum's theme learning and is highly practical for use as an alternative to classroom-based learning. According to Nalinda & Sulistyorini (2018), a student's learning environment enriched by many senses can help them learn better. It can be done by using interactive multimedia that can increase student learning.

Prezi Media is a solution to the issues mentioned above. Prezi is an online presentation-making tool that offers a variety of presentation-building possibilities. Prezi's vision is similar to a mind map, making it easier for students to comprehend instructional content (Saputri, et al 2016). As a result, Prezi enables the presentation's components or media to be blended according to the intended notion. According to Aotar et al. (2016), students who have prior experience with Prezi media can integrate effectively in analyzing

difficulties assigned by the teacher in order to generate logical and scientific reasoning ideas through the use of reasonable decisions.

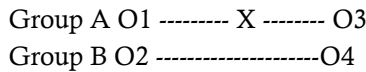
The researcher discovered a gap in previous research regarding PBL model learning, concept understanding, and critical thinking skills. Specifically, there has been no research examining the application of the PBL model assisted by Prezi media to assess students' critical thinking skills and conceptual understanding. Haryanti (2017) demonstrated that the PBL model effectively develops kids' critical thinking skills in primary education. The attributes of the PBL model, which contextualizes and authenticates problems, align the PBL model with the characteristics of elementary school children. This research has limitations in the orientation phase. At this point, students require teacher guidance as they investigate the material. Due to these limitations, this study employs media in the form of Prezi to assist students in explaining the material's main points. Nugraha et al. (2017) demonstrated that the PBL paradigm combined with outdoor learning improved students' critical thinking skills and motivation to learn in fifth-grade elementary school. This study also focuses on science subjects with no supporting learning media. The measured variable is also learning motivation. Meanwhile, the researcher wanted to test the PBL model with Prezi media for social studies subjects. The variables in this study were critical thinking and conceptual understanding.

This study aims to (1) determine the validity of the PBL model in Social Studies learning and (2) determine the impact of the PBL model in Social Studies learning on students' critical thinking skills and conceptual knowledge. This research has both theoretical and practical implications. Theoretical benefits include material that can be used to develop Vygotsky's theory. The PBL paradigm with Prezi media helps students understand concepts and develop critical thinking skills. This research benefits students, instructors, and schools. This research can help students develop critical thinking skills and a better grasp of social studies subjects. For instructors, this research is beneficial because it

identifies a method for fostering innovative learning in social studies subjects using the PBL approach in conjunction with Prezi media. Additionally, the benefit for schools are that it can contribute to improving learning so that students are able to get optimal learning outcomes.

**METHODS**

This research employed a quasi-experimental design in a Nonequivalent Control Group Design. Figure 1 illustrates the research scheme for the Nonequivalent Control Group Design.



Description:

- Group A :PBL model with Prezi Media
- Group B :control group based on the PBL model
- O1 :pretest of capacity to think critically and comprehension of experimental class concepts
- O2 :pretest of critical thinking ability and comprehension of concepts from the control class
- O3 :posttest capacity for critical thinking and comprehension of class concepts

- O4 :posttest capacity for critical thinking and comprehension of the notion of control class
- X :Prezi Media assists in the understanding of PBL models

This study utilized pre-existing groups or class as experimental and control groups. Each group received a pretest to ascertain the two groups' beginning conditions before therapy. Additionally, the experimental group received a learning therapy utilizing the PBL model with the assistance of Prezi media. In contrast, the control group received a learning treatment utilizing the PBL model directly.

The population for this study included all fourth-grade students at primary School of Ki Hajar Dewantara Cluster in the Purwanegara District of the Banjarnegara Regency during the academic year 2021/2022. The population of this study was 61 students from Elementary School of 2 Kaliajir, as the experimental class, and Elementary School of 3 Petir as the control class. Purposive sampling was used to decide to sample. This sampling was based on the same curriculum, notably the 2013 curriculum with Prezi media accompaniment. Table 1 displays the research sample distribution.

**Table 1.** Research Sample Distribution

Number	School Name	The Number of Students	Description
1.	2 Kaliajir Primary School	30	Exsperiment Class
2.	3 Petir Primary School	31	Control Class
Total		61	

The PBL Model, Prezi Media, Critical Thinking Ability, and Student Concept Understanding were used as variables in this study. There were two distinct sorts of data collection techniques: experimental and non-experimental. There were two types of exams:

description tests to assess critical thinking and short entry tests to assess conceptual comprehension. They collect data utilizing observation and documentation strategies to assess the PBL model's validity. Observation and documentation with expert validators.

Techniques of observation were aided by expert validators. Three specialists make up the PBL validator: Enan Setiyadi, M.Pd., Prof. Dr. Erni Suharni, M.Sc., and Dr. Deni Setiawan, S.Sn., M.Hum. The syllabus, lesson plans, student workbooks, learning media, critical thinking ability exams, and concept knowledge assessments are all used to determine the validity of the PBL paradigm. The research prerequisite test, which includes the normality and homogeneity tests, was used to analyze the data. Meanwhile, hypothesis testing methodologies included the expert validator test, the t-test, and the normalized gain test.

## RESULTS AND DISCUSSION

The study's findings are the outcomes of testing the research hypotheses. In contrast, the

discussion examines the further meaning of the research findings. The hypotheses and findings of this study include (1) the PBL model assisted by Prezi Media is valid for social studies learning in fourth-grade elementary school; (2) PBL model assisted by Prezi Media is effective on critical thinking skills and conceptual understanding for fourth-grade elementary school students in social studies learning; and (3) PBL model assisted by Prezi Media can improve critical thinking skills and understanding of concepts for fourth-grade elementary school students in social studies learning.

Prerequisite tests in this study include normality and homogeneity tests in the control and experimental classes. Analysis of normality test uses Kolmogorov-Smirnov test. Table 2 shows the results of the normality test for the control class.

**Table 2.** Normality Test for Control class

	Understanding Concept	Critical Thinking
N	31	31
Kolmogorov-Smirnov Z	.806	.807
Asymp. Sig. (2-tailed)	.535	.534

Meanwhile, Table 3 shows the results of the normality test for the experimental class

**Table 3.** Normality Test for Experiment class

	Understanding Concept	Critical Thinking
N	30	30
Kolmogorov-Smirnov Z	.105	.807
Asymp. Sig. (2-tailed)	.174	.228

Because the significance value is more significant than 0.05, it is known that the normality test results are regularly distributed based on the normality values in Table 2 and Table 3. The control class's significant values for conceptual understanding and critical understanding are 0.535 and 0.534, respectively. In contrast, the experimental class significance

values for conceptual understanding and critical understanding are 0.174 and 0.228.

The homogeneity exam measures conceptual knowledge and critical thinking skills. In this case, the homogeneity test determines if the data is homogeneous. Table 4 shows the results of the homogeneity test in brief.

**Table 4.** The Homogeneity Test

Variable	Levene Statistic	df1	df2	Sig.
Understanding Concept	2.665	1	59	.109
Critical Thinking	.959	1	59	.331

According to the output of the Test of Homogeneity of Variances in Table 4, the Sig. value for each variable is 0.109 and 0.331. Because the result above the significance level is more than 0.05, so all of the constructs employed in the study are homogeneous.

**1. The PBL model, assisted by Prezi Media, is valid to fourth-grade social studies instruction in elementary school.**

The validity of the PBL model on social studies learning was determined using construct validity based on the opinions of education professionals and practitioners. The validator was composed of three experts: Enan Setiyadi, M.Pd, Prof. Dr. Erni Suharni, M.Sc., and Dr. Deni Setiawan, S.Sn., M.Hum. The syllabus, lesson

plan, Student Worksheet (LKPD), Learning Media, Critical Thinking Ability Test, and Concept Understanding Test approved PBL model learning materials.

**a). The Results of The Syllabus Validation**

The syllabus was validated by three validators and received a final score of 39.7 with excellent criteria and was suitable for usage with minor modifications. The validator's assessment was recorded on the validation sheet and was used as a reference during the syllabus improvement process. The following table summarizes the findings of examining the syllabus's three validators.

**Tabel 5.** The Results of The Syllabus Validation

Validator	Score	Criteria
Validator 1	41	Sangat Baik
Validator 2	39	Sangat Baik
Validator 3	39	Sangat Baik
Rata-rata	39.7	Sangat Baik

**b). Lesson Plan Validation Result**

According to a validity check conducted by three specialists, the category was excellent,

which implies that all indicators in the lesson plan were pronounced valid. Table 6 shows the results of the lesson plan validation from experts.

**Table 6.** Lesson Plan Validation Results

Validator	Score	Criteria
Expert 1	47	Excellent
Expert 2	46	Excellent
Expert 3	48	Excellent
Average	47	Excellent

**c). The Results of The Validation of Teaching Materials**

Validation of instructional materials includes examining the structure of the materials, the topic conveyed, and the language used.

According to the expert validators' findings, the teaching materials are categorized as an excellent, with an average score of 36.7, thus being declared valid. Table 7 shows the results of the validation of teaching materials experts.

**Table 7.** The Results of The Validation of Teaching Materials

Validator	Score	Criteria
Expert 1	37	Excellent
Expert 2	36	Excellent
Expert 3	37	Excellent
Average	36.7	Excellent

**d). Student Worksheet (LKPD) Validation Results**

Validating the Student Worksheet (LKPD) entails conducting content and linguistic tests. The validation of the student worksheets by the three validators revealed that the final number was 28, which met all of the criteria and was

suitable for use with minor modifications. The validator's assessment is recorded on the validation sheet and is used as a guide in refining the Student Worksheet. Table 8 shows the assessment results of the three validators on the Student Worksheet.

**Table 8.** Student Worksheet Validation Results

Validator	Score	Criteria
Expert 1	28	Excellent
Expert 2	27	Excellent
Expert 3	29	Excellent
Average	28	Excellent

**e). Learning Media Validation Results**

Three expert validators evaluated learning media and determined that it fulfills the excellent category with an average score of 32.3, indicating

that it is valid with minor adjustments. Table 9 shows the results of expert validation related to learning media.

**Table 9.** Learning Media Validation Results

Validator	Score	Criteria
Expert 1	33	Excellent
Expert 2	31	Excellent
Expert 3	33	Excellent
Average	32.3	Excellent

**f). Critical Thinking Ability Test Validation Results**

Validation of the critical thinking ability test entails two component which consist of content and language. Four indicators pertain to the content, while three pertain to the language.

All indicators have been verified to ensure that they meet the requirements for the validity of research instruments that use excellent indicators. Table 10 summarizes the validation results for the critical thinking ability test.

**Table 10.** Critical Thinking Ability Test Validation Results

Validator	Score	Criteria
Expert 1	26	Excellent
Expert 2	23	Excellent
Expert 3	27	Excellent
Average	25.3	Excellent

### g). Conceptual Understanding Test Validation Results

The validity of the conceptual understanding test was evaluated on two levels, namely content, and language. According to the

results of three expert validators, the average was 25.7, with an excellent category indicating that it is valid. Table 11 shows the results of the expert validation of the conceptual understanding test.

**Table 11.** Conceptual Understanding Test Validation Results

Validator	Score	Criteria
Expert 1	27	Excellent
Expert 2	23	Excellent
Expert 3	27	Excellent
Average	25.7	Excellent

Based on the validation of all components by Validator I, Validator II, and Validator III, it is possible to conclude that all components of PBL learning tools are valid and suitable for use in learning. The Prezi media-based PBL methodology can facilitate students' contextual learning, hence increase the meaning and enjoyment associated with learning. Kurnianto (2021) asserted that student happiness is heavily dependent on their perceptions and expectations to accomplish learning through a quality learning experience. Rohman's (2021) research demonstrated that Prezi-based media is valid and engages students during learning activities, ensuring that students comprehend the learning information.

Martono developed the Prezi application to aid in learning in 2015, which discovered that Prezi media is feasible and can be used as an alternative thematic teaching tool in fifth-grade elementary school (Divayuda et al, 2021). Another recent finding from Pinem et al. (2022) demonstrated that the average score for the

syllabus, lesson plans, and student activity sheets (LAS) is 3.90; 3.89; and 3.80, with an excellent category. Additionally, student responses to the PBL model's application were good, with an average score of 3.62 in the convenient area. According to Riana et al. (2018), PBL learning engages students in the learning process and trains them to use higher-order thinking processes when solving problems, hence improving learning outcomes.

### 2. The PBL model, assisted by Prezi Media, helps fourth-grade elementary school students to studying social subjects develop critical thinking abilities and conceptual knowledge.

The independent sample T-test was used with SPSS 23 to determine the effectiveness of the PBL model assisted by Media Prezi on students' critical thinking skills in the control and experimental classes. Table 12 shows The findings of the independent sample T-Test on the effectiveness of students' critical thinking skills.

**Table 12.** Output Independent Sample T-Test Critical Thinking Ability

		t	df	Sig. (2-tailed)	Mean Difference
Critical Ability	Thinking	3.75	59	.000	11.90
		Equal Variances Assumed			
		3.76	56.1	.000	11.90
		Equal Variances not Assumed			



According to the Result of Independent Sample Test in Table 12, Equal variances have a Sig value of 0.000. Because this value is smaller than 0.05, there is a substantial (significant) difference in the average critical thinking abilities of the control and experimental groups.

The effectiveness of the PBL model, assisted by Prezi Media, on students' conceptual understanding was also examined by using SPSS 23's independent sample T-Test. Table 13 shows the results of the independent sample T-Test test on students' conceptual understanding.

**Table 13.** Independent Sample T-Test Output Concept Understanding

		t	df	Sig. (2-tailed)	Mean Difference
Concept Understanding	Equal Variances Assumed	6.74	59	.000	22.04
	Equal Variances not Assumed	6.77	54.9	.000	22.04

According to the data in Table 13, Equal variances assumed has a Sig value of 0.000. This number is less than or equal to 0.05. It indicates a significant (significant) difference in the average level of conceptual knowledge between the control and experimental classes employed in this investigation.

The application of the PBL model in combination with Prezi media content has a substantial impact on student learning activities, which results in increased critical thinking and students' conceptual understanding.

Perron & Streams cited by Muharni, et al (2021) explained that Prezi is software for Internet-based presentations. Additionally, Prezi can be used as a tool for exploring and sharing ideas on a virtual canvas. Prezi is fantastic because it incorporates a "Zoom User Interface" (ZUI) that enables users to zoom in and out of the presentation media. According to Ikram et al. (2021), one of the advantages of Prezi media over other presentation software is the zoomable canvas, which eliminates the need for users to transition between slides, allowing students to focus on a single learning subject. It is believed that by utilizing the Prezi site, students' critical thinking would emerge, and various questions will occur. It is consistent with the PBL model's concept of manipulating and modifying Prezi media content to make problem-based learning more concrete.

According to Hamalik, as cited by Farihatun & Rusdarti (2019), learning is the process by which behavior is modified or strengthened by the experience. Learning is not limited to memory but encompasses a broader range of activities, most notably experiencing. The learning outcome is not mastery of the exercise's results but a behavior change. PBL model learning begins with the study and identification of a real-world problem. Therefore, PBL model's learning process can directly affect student behavior to improve their understanding of a subject area. When students master and understand a subject, it is assumed that their understanding of concepts has increased.

According to Safi'i and Bharata (2021), a good understanding of concepts for students requires a method of learning that is more than just memorizing and motivating students to connect what they have learned with what they have. Students who lack sufficient conceptual understanding skills will struggle to study. According to Rusyda (2017), students' conceptual understanding can improve if they link their knowledge to the real world. Students must actively participate in order for learning to be meaningful.

Kasim et al. (2019) demonstrated that the critical thinking ability test results were significantly smaller at 0.000 than the 0.05 value, while the results of the learning motivation test

were much lower at 0.000. Based on these findings, it can be concluded that H0 and H1 are valid. It suggests that the use of Prezi learning material affects students' critical thinking abilities and motivation to study. Widowati & Purwanto (2018) also found that Prezi-based learning media can boost students' critical thinking skills. Based on the study's findings, it was found that Prezi-based learning had produced media on respiratory materials of living things that matched the qualifying criteria for both materials and media display forms. Prezi-based learning media can improve students' critical thinking skills with a gain of 0.32 with moderate improvement criteria.

Handayani et al. (2018) found that Developing Prezi Multimedia Based on problem-based learning improves conceptual knowledge. The learning media developed is valid and useful in the learning process. Muliatin (2019) found that the PBL approach follows the 2013 curriculum's standard process. PBL can help students understand higher concepts than direct learning. Because learning the PBL paradigm allows students to build critical and creative thinking skills.

Based on the data analysis and empirical and theoretical studies, it can be concluded that the PBL model assisted by Prezi Media is valid for social studies learning and successful at considerably boosting students' critical thinking abilities and conceptual understanding. Based on earlier research studies that provided the basis for research, the PBL model in this study is more contextual and relevant since it is combined with Prezi media which gives concrete visualization for students. The contextual PBL model uses real-life examples, which increases student satisfaction and interest.

## CONCLUSION

Based on the research findings, analysis, and in-depth discussion conducted with fourth-grade students from 2 Kaliajir Primary School as an experimental class and 3 Petir Primary School as a control class there are two conclusions that can be conveyed. The findings are that the PBL

model assisted by Prezi media in social studies learning in fourth-grade has met the instrument's validity requirements, making it feasible and valid for social studies teaching activities. In addition, the PBL model assisted by Prezi media is effective for improving critical thinking skills and understanding concepts.

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