

The Effect of Problem Based Learning (PBL) Model Assisted by Quizizz Media on IPAS Learning Outcomes of Grade IV Students in Public Elementary Schools in Sanggau Regency

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ABSTRACT: This study aims to examine the effect of the Problem Based Learning (PBL) model assisted by Quizizz media on the IPAS learning outcomes of Grade IV students in public elementary schools in Sanggau Regency. The background of this research is the low student learning outcomes caused by conventional teacher-centered instruction and the limited use of interactive learning media in the material on Social and Cultural Diversity in Indonesia. This research adopts a quantitative approach using quasi-experimental research method with a Non-Equivalent Control Group Design. The research population consisted of 45 Grade IV students from three public elementary schools in Sanggau Regency (SDN 01 Sanggau, SDN 02 Balai Karangan, and SDN 14 Sekumpai). The sample was determined using a purposive sampling technique, with SDN 01 and 02 as the experimental group (n=30) and SDN 14 Sekumpai as the control group (n=15). Data were collected through multiple-choice tests (pre-test and post-test), observation, and interviews. Data analysis was conducted using Independent Sample t-Test and N-Gain test. The research results are expected to demonstrate a significant effect of the PBL model assisted by Quizizz media on improving students' IPAS learning outcomes compared to conventional learning.

KEYWORDS: Problem Based Learning, Quizizz, IPAS Learning Outcomes, Cultural Diversity, Quasi- Experiment

I. INTRODUCTION

Education plays a strategic and fundamental role in developing quality human resources capable of adapting, thinking critically, and competing constructively in the global era (unesco, 2021; dewey, 2023). Within the context of Indonesian national education, natural and social sciences (IPAS) learning at the elementary school level holds a vital position as mandated by the merdeka curriculum, designed to equip students with conceptual knowledge, positive social attitudes, and practical skills useful in social life (kemendikbudristek, 2022). At the grade IV elementary level, the material on social and cultural diversity in Indonesia (chapter 7) is particularly essential. Indonesia is a nation with exceptionally high heterogeneity, comprising more than 1,340 ethnic groups (statistics Indonesia, 2023). Particularly in Sanggau regency, which is inhabited by diverse ethnicities including the Dayak and Malay peoples, understanding this diversity is highly relevant to fostering interethnic harmony from an early age (banks & banks, 2019). However, field realities indicate that IPAS learning continues to face significant challenges. Conventional teacher-centered instruction causes students to remain passive and unable to internalize the meaning of diversity. Three primary problems were identified: (1) in the aspect of ethnic diversity, students merely memorize ethnic group names without understanding their essence; (2) in the aspect of religious diversity, students' understanding is limited to administrative formalities; and (3) in the aspect of cultural diversity, there is a significant gap between theoretical knowledge and actual practice. The problem based learning (PBL) model is a learning model that positions students as the center of learning through solving authentic real-world problems (Fathurrohman, 2015; Amir, 2018). Combined with Quizizz media as a game-based learning platform, this model is expected to enhance students' motivation, active engagement, and cognitive learning outcomes (Kurniawan & Rahmawati, 2020). Previous research by Widiastuti and Santoso (2022) confirmed that integrating PBL with digital media is more effective than conventional instruction in improving learning activities and outcomes. Based on the foregoing, this study aims to examine the effect of the PBL model assisted by Quizizz media on IPAS learning outcomes of grade IV students in public elementary schools in Sanggau regency, focusing on the material of social and cultural diversity in Indonesia.

1.1 IPAS Learning

Natural and Social Sciences (IPAS) is an integrated subject that combines natural and social sciences in elementary education. IPAS learning provides explanations to develop knowledge, understanding, and analytical abilities regarding social conditions and

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natural phenomena (Setiawati et al., 2019). Under the Merdeka Curriculum, the objectives of IPAS learning include: (1) teaching basic concepts of sociology, geography, economics, history, and natural science; (2) building awareness of social values and environmental sustainability; and (3) enhancing cooperative and competitive abilities in a diverse society (Kemendikbudristek, 2022).

1.2 Problem Based Learning (PBL) Model

PBL is a learning model grounded in constructivist theory, which holds that knowledge is actively constructed by students through experience and interaction with the environment. According to Fathurrohman (2015), the PBL syntax consists of five phases: (1) Orienting students to the problem; (2) Organizing students for learning; (3) Guiding individual and group investigations; (4) Developing and presenting work; and (5) Analyzing and evaluating the problem-solving process.

1.3 Quizizz as Learning Media

Quizizz is an online game-based learning platform that enables teachers to create interactive quizzes. This media offers features such as instant feedback, detailed result reporting, and gamification elements like points, leaderboards, and avatars, proven to enhance student motivation and engagement (Kurniawan & Rahmawati, 2020). When integrated with PBL, Quizizz is utilized in Phase 5 (evaluation) as an interactive and engaging formative assessment medium.

1.4 IPAS Learning Outcomes

Learning outcomes refer to behavioral changes encompassing cognitive, affective, and psychomotor domains as indicators of student learning success. In this study, learning outcomes focus on the cognitive aspect using the Revised Bloom's Taxonomy, encompassing six levels: remembering (C1), understanding (C2), applying (C3), analyzing (C4), evaluating (C5), and creating (C6) (Anderson & Krathwohl, 2001). Assessment indicators emphasize mastery of the material on the Diversity of Ethnicities and Culture in Indonesia.

II. METHODOLOGY

2.1 Research Approach and Design

Applied is the Non-Equivalent Control Group Design, where an experimental group and a control group exist without random assignment. Both groups are given pre-tests before the treatment and post-tests after the treatment (Sugiyono, 2019; Creswell, 2022).

Table 1. Non-Equivalent Control Group Design

Group	Pre-Test	Treatment	Post-Test
E (Experiment)	O1	X (PBL + Quizizz)	O2
K (Control)	O3	– (Conventional)	O4

2.2 Population and Sample

The research population consisted of 45 Grade IV students from public elementary schools in Sanggau Regency in the 2025/2026 academic year across three schools. The sample was determined using purposive sampling based on criteria of equivalent school accreditation, availability of digital technology facilities, and equivalent teacher qualifications.

Table 2. Research Sample Distribution

Elementary	School Name	Students	Male	Female	Description
	SD Negeri 01 Sanggau	15	8	7	Experimental Group
	SD Negeri 02 Balai Karangan	15	7	8	Experimental Group
	SD Negeri 14 Sekumpai	15	8	7	Control Group
Total		45	23	22	

2.3 Data Collection Techniques

Data collection was conducted through three techniques: (1) Test technique, comprising 20 multiple-choice items measuring cognitive learning outcomes (C1–C6) in pre-test and post-test formats; (2) Direct observation technique, using teacher observation

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sheets (14 aspects, 1–4 scale, maximum score 56) and student observation sheets (15 indicators, 1–4 scale, maximum score 60); and (3) Semi-structured interview technique with teachers and students to obtain supplementary data.

2.4 Instrument Validity Test

Instrument validity was established through content validity via expert judgment by supervisors and subject matter experts, and empirical validity using Pearson Product Moment correlation (r -table = 0.361 for $N=30$). Reliability was tested using the Cronbach Alpha method ($\alpha \geq 0.60$ = reliable). Item difficulty levels were classified as: easy ($P = 0.71-1.00$), moderate (0.31– 0.70), and difficult (0.00–0.30), with priority given to the moderate category.

2.5 Data Analysis Techniques

Data analysis employed: (1) Descriptive statistics to describe mean values, standard deviations, and frequency distributions; (2) Prerequisite analysis tests including Normality Test (Kolmogorov-Smirnov/Shapiro-Wilk) and Homogeneity Test (Levene Test); and (3) Hypothesis testing using Independent Sample t-Test to examine significant differences and N-Gain Test to measure the effectiveness of learning outcome improvement. If data are non-normal, the Mann-Whitney Test will be used.

III. RESULTS AND DISCUSSION

3.1 Research Conceptual Framework

The conceptual framework of this research begins with an empirical problem, namely the low learning activity and IPAS learning outcomes of Grade IV students in public elementary schools in Sanggau Regency, particularly on the material of Ethnic and Cultural Diversity. This condition is attributed to conventional passive teacher-centered instruction. Through the implementation of the PBL model assisted by Quizizz, it is expected that students' active engagement, critical thinking ability, and ultimately their cognitive learning outcomes will significantly improve.

3.2 Research Hypotheses

Based on the conceptual framework, the hypotheses proposed are: (H_{a1}) There is a significant effect of the PBL model assisted by Quizizz media on IPAS learning outcomes of Grade IV students in public elementary schools in Sanggau Regency; (H_{a2}) The use of Quizizz media within the PBL model is effective in improving students' motivation and cognitive learning outcomes on social and cultural diversity material; and (H_{a3}) There is a significant difference in IPAS learning outcomes between students taught with the PBL model assisted by Quizizz compared to those taught using conventional methods.

3.3 Theoretical Discussion

The application of the PBL model in IPAS learning on Social and Cultural Diversity material provides students with opportunities to confront real problems relevant to the local context of Sanggau Regency. For example, the problem of the threatened extinction of the Dayak Kanayatn tribal traditions serves as an authentic problem trigger that encourages students to analyze, seek information, and collaboratively formulate solutions. This aligns with constructivist learning principles that emphasize the active process of knowledge construction. The integration of Quizizz in the PBL evaluation phase introduces an enjoyable and competitive assessment experience. Gamification elements such as instant points, leaderboards, and virtual avatars are proven to increase students' intrinsic motivation and encourage active participation (Kurniawan & Rahmawati, 2020). Thus, the combination of PBL and Quizizz creates a learning ecosystem that is not only cognitively challenging but also emotionally engaging, contributing to optimal improvement in learning outcomes.

CONCLUSION

Based on the theoretical review and research design formulated, it can be concluded that the application of the Problem Based Learning (PBL) model assisted by Quizizz media is a highly relevant approach with great potential for improving IPAS learning outcomes of Grade IV students in public elementary schools in Sanggau Regency. The PBL model facilitates students to think critically and solve problems authentically, while Quizizz media provides interactive and motivating formative evaluation. This research is expected to make a scientific contribution to the development of 21st-century learning theory, particularly the integration of problem-based models with digital technology. Practically, the findings of this research can serve as a reference for teachers in designing more innovative, contextual, and student-centered IPAS learning, especially on material related to local cultural diversity.

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