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Zep Quiz-Assisted Problem-Based Learning in Grade Nine Pancasila Education: Critical Thinking and Learning Activities in One Classroom

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ABSTRACT

Purpose: This study aims to examine the implementation of Problem-Based Learning (PBL) assisted by Zep Quiz in Pancasila Education and explore its contribution to students' critical thinking skills and learning activities in Grade IX. **Methods:** This study employed a qualitative research design with an interpretative phenomenological approach at SMP Negeri 9 Dampelas. The participants consisted of seven informants, including one teacher, one principal, and five students, within a classroom of 18 students. Data were collected through interviews, classroom observations, tests, and documentation. The data were analyzed using the Miles and Huberman interactive model, comprising data reduction, data display, and conclusion drawing and verification. **Findings:** The results indicate that PBL assisted by Zep Quiz facilitated the development of five critical thinking dimensions: interpretation, analysis, evaluation, inference, and explanation. Students also demonstrated visual, oral, listening, writing, and motor learning activities. Descriptive test results showed an increase in the class mean score from 63.33 in the pre-test to 85.56 in the post-test. These results indicate a positive classroom performance pattern but do not establish a causal effect. **Research Implications:** The findings suggest that teachers can integrate interactive digital quizzes with contextual problem-solving activities to encourage student participation, reasoning, and meaningful engagement in Pancasila Education. **Originality:** This study provides a contextual account of integrating Zep Quiz with PBL in Grade IX Pancasila Education by distinguishing the roles of digital quiz media, problem-based instruction, and teacher facilitation.

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INTRODUCTION

Pancasila Education is expected to develop students' capacity to interpret civic values and apply them to social situations, not merely recall the five principles or their symbols. In the Grade IX classroom examined in this study, the Pancasila Education teacher reported that students could answer recall-based questions but needed support to connect concepts with problems in their surroundings. This contextual concern is consistent with research that places authentic civic problems at the center of learning, although differences in school level and research design limit direct comparison. Marzuki & Basariah, (2017) examined PBL and Project Citizen in civic education, while (Fathurrohman et al., 2025) studied PBL in Pancasila Education and (Chotimah & Sulkipani, 2026) addressed problem-based inquiry in civic education.

Problem-Based Learning (PBL) provides a structured way to connect curriculum content with authentic problems. Students are expected to identify a problem, organize inquiry, investigate relevant information, develop and present a solution, and evaluate the problem-solving process. The teacher's role is to facilitate inquiry and prompt students to justify their interpretations rather than supply conclusions immediately. Findings from different subjects and age groups are useful comparisons, but should not be treated as direct predictions for this classroom.

Critical thinking is considered through five dimensions: interpretation, analysis, evaluation, inference, and explanation. These dimensions organize evidence about how students understand a problem, identify relationships, assess information and arguments, formulate conclusions, and explain or defend a position. They are not interchangeable: a question about a news source may indicate an evaluative orientation but does not by itself prove a fully reasoned judgment.

Zep Quiz is a digital quiz platform that incorporates game-like elements and interactive response formats. Its role in the present instructional design is narrower than that of PBL: PBL supplies the problem-solving framework, whereas Zep Quiz provides a quiz-based format through which students respond to prompts and receive feedback. Research on gamification distinguishes cognitive, motivational, and behavioral outcomes, cautioning against treating visible engagement as proof of deeper learning. Recent platform-specific studies have examined Zep Quiz as a game-based evaluation medium in Informatics (Fitri et al., 2025) and as an interactive medium related to students' learning interest (Mushfiroh & Mardliyah, 2026). Studies of Quizizz offer adjacent comparisons, but Quizizz and Zep Quiz are different platforms and their findings cannot be transferred without qualification.

Problem-Based Learning offers a problem-centered framework in which students investigate authentic situations and develop reasoned responses. Marzuki & Basariah, (2017) explain the relevance of complex problems and teacher facilitation, while (Darmawati & Mustadi, 2023) discuss the relationship between PBL and critical thinking in another subject context. These studies support the pedagogical rationale for the present inquiry, but their findings must be interpreted in light of differences in subject, age group, and research design (Marzuki & Basariah, 2017); (Darmawati & Mustadi, 2023).

Critical thinking in this study is discussed through interpretation, analysis, evaluation, inference, and explanation. Research in civic education emphasizes the relevance of authentic problems, dialogue, and teacher guidance to critical-thinking instruction (Fathurrohman et al., 2025).

Zep Quiz is used as a digital quiz platform to support student engagement. Interest in game-like features may provide an entry point into learning, but on-screen participation needs to be connected to meaningful tasks. Sailer & Homner, (2020) distinguish cognitive, motivational, and behavioral outcomes in gamification research. Studies of Quizizz have identified roles for digital quizzes in promoting participation and concentration in other contexts, but they concern a different platform (Astuti et al., 2021); (Ekantini & Damayanti, 2023); (Sailer & Homner, 2020); (Astuti et al., 2021); (Ekantini & Damayanti, 2023).

Research on digital quiz media should distinguish interest, activity, and reasoning outcomes. The meta-analysis by (Sailer & Homner, 2020) synthesizes gamification outcomes, while (Narmaditya et al., 2018) examines PBL and critical thinking through a lesson-study approach rather than a meta-analysis. Together, these studies support contextual examination without presuming uniform improvement.

Research on digital citizenship emphasizes that technology use should be connected to participation and social responsibility. (Armawi & Wahidin, 2020); (Halimi et al., 2022), and (Triastuti, 2019) provide context for the relationship between technology and citizenship. The present inquiry is narrower: how students' responses to social issues are represented in digitally supported Pancasila Education.

The research gap concerns the relationship among problem-based instruction, quiz-mediated engagement, and manifestations of reasoning in one Grade IX classroom. The article does not claim to be the first study to combine PBL and Zep Quiz. Its contribution lies in mapping interview, observation, documentation, and test evidence while distinguishing visible activity from the quality of thinking. Previous studies report variation across PBL contexts, which reinforces the need for contextual interpretation (Narmaditya et al., 2018); (Darmawati & Mustadi, 2023).

This study addresses two questions: (1) How are the five dimensions of critical thinking represented in the available interview, observation, and assessment evidence during Zep Quiz-assisted PBL in Grade IX Pancasila Education? (2) What forms of visual, oral, listening, writing, and motor learning activity are recorded during the instructional process?

The study's contribution is an evidence-based description of the complementary but distinct functions of PBL, Zep Quiz, and teacher facilitation. It distinguishes informants' accounts from observation-checklist ratings and descriptive test-score patterns. This distinction is important because participation, critical-thinking indicators, and test performance are related but conceptually different outcomes.

METHOD

The thesis identifies the study as qualitative research using an interpretative phenomenological orientation. The present article retains that qualitative orientation and uses the five critical-thinking dimensions as analytical categories. The thesis also includes pre-test and post-test records; these are presented as supplementary descriptive evidence, not as an experimental estimate of causal impact. The importance of dedicated assessment tools in citizenship and digital-literacy research is also noted by (Tirza et al., 2025).

The research was conducted at SMP Negeri 9 Dampelas, Desa Pani'i, Kecamatan Dampelas, Kabupaten Donggala, Central Sulawesi, during July–October 2026 in the first semester of the 2026/2027 academic year. The classroom focus was Grade IX, comprising 18 students. The class population should not be confused with the number of interview informants.

The informant profile in the thesis lists seven people: Efa Arna, S.Pd., Gr. (Pancasila Education teacher); Syarif Hidayat, S.Pd., M.Pd. (principal); and five students, Ikbal, Lionel Valdes, Elis, Ni Nyoman Celsi, and Dhini Angela Putri. The interview excerpts reproduced in the thesis are principally attributed to the teacher and principal. The thesis records interview dates of 10 August 2026, but does not specify the number or duration of interview sessions, selection criteria for each student informant, or a complete transcript set. These details are therefore not inferred.

Data collection comprised interviews, classroom observation, tests, and documentation. The observation instrument used a four-point scale (1 = not yet demonstrated; 2 = sometimes and with frequent guidance; 3 = often and sometimes with prompting; 4 = consistently and independently). Documentation included the teaching module, research-permission and completion letters, interview documentation, Zep Quiz displays, the test instrument, and pre-test/post-test score tables. The available teaching module specifies a 2 × 45-minute lesson and a five-item scenario-based Zep Quiz activity during the problem-orientation stage; it also describes a PBL sequence involving problem orientation, student organization, investigation, presentation, and evaluation. The thesis does not provide a complete session-by-session log for the full research period (Armawi & Wahidin, 2020; Alrakhman et al., 2024; Halimi et al., 2022).

The observation checklist covered nine behaviors across five critical-thinking dimensions: interpretation (two behaviors), analysis (two), evaluation (two), inference (one), and explanation (two). It also covered nine behaviors across five learning-activity categories: visual (two), oral (two), listening (two), writing (two), and motor (one). The test instrument contained 20 items and was administered before and after the instructional sequence. The thesis describes the items as targeting analysis, evaluation, and problem-solving at the C4–C5 level.

The thesis describes qualitative analysis through the interactive model of Miles and Huberman: data reduction, data display, and conclusion drawing/verification. In this article, interview statements and observation-checklist entries are organized under the study's dimensions, compared for consistency, and interpreted in relation to the research questions. The thesis does not provide a separate coding manual, coded transcript excerpts, an audit trail, or a detailed account of formal triangulation. Accordingly, the article does not claim procedures beyond the documented reduction, display, and verification framework.

Research permission is documented by a university letter dated 20 July 2026, and the school issued a letter confirming that the research had been conducted. The thesis does not include a separate written consent/assent form for each adult or student participant. This documentary limitation is acknowledged rather than treated as evidence that individual consent procedures were or were not completed. Student identities are not repeated in the analysis beyond the informant profile recorded in the thesis.

Pre-test and post-test scores were summarized using the class mean and the number of students meeting the threshold shown in the thesis score tables (75). No inferential significance test, effect-size estimate, or comparison group is reported. Consequently, the score pattern describes change observed in this class; it does not establish that PBL or Zep Quiz independently caused the change. Interview and observation findings remain central to the qualitative interpretation.

RESULTS

Overview of Instruction and the Need to Connect Concepts with Cases

The thesis describes an instructional context in which students were expected to move beyond recalling Pancasila principles and apply them to current social problems. The teacher identified a need to connect conceptual knowledge with situations familiar to adolescents, including issues circulating on social media and bullying. The lesson module also uses a case of student fighting (tawuran antar pelajar) to prompt discussion about the application of Pancasila values.

The teacher explained that students could recall the principles and symbols of Pancasila but needed a bridge to interpret them in real situations. She noted that problem-based discussion of current social issues encouraged students to respond and express ideas, while still requiring teacher guidance (Interview, 10 August 2026; Efa Arna, Pancasila Education teacher).

A second interview excerpt shows why teacher scaffolding remained necessary. The teacher reported that some students could distinguish symptoms from the main problem, whereas others tended to draw conclusions too quickly and needed prompting questions to identify the root issue. The principal similarly emphasized the need for creative instruction to reduce boredom and support engagement (Interviews, 10 August 2026; Efa Arna and Syarif Hidayat).

The teaching module documents a 2 × 45-minute lesson plan. It begins with a contextual problem, asks students to access Zep Quiz on their devices, and uses five short scenario-based questions related to the problem. The module then situates the quiz within the wider PBL sequence of investigation, group discussion, presentation,

and evaluation. This document provides evidence of the planned integration of the platform; it is not a complete record of every session conducted during the research period.

The evidence suggests complementary roles rather than interchangeable functions. PBL frames the inquiry around a social problem and requires students to identify, investigate, discuss, and propose a response. Zep Quiz supplies an interactive quiz format and game-like visual feedback that may support initial participation. Teacher prompts remain important when students move from selecting an answer to explaining why a particular interpretation or solution is justified.

Indications of Critical Thinking in the Teacher's Account

The interview and observation materials provide different levels of support across the five dimensions of critical thinking. Evaluation is supported by the teacher's description of students questioning the source and truthfulness of social-media news and assessing classmates' arguments. The observation checklist records a score of 4 for both evaluation behaviors. The remaining dimensions are also represented in the checklist, but their ratings and interview examples differ in strength.

The teacher reported: "*When presented with a problem, students have shown a critical attitude by asking where the news came from, whether the news was true or merely information circulating on social media. During group discussions, some students were able to evaluate classmates' opinions, especially when an argument clearly contradicted Pancasila values. Some students still chose to remain silent because they lacked confidence*." (Interview, 10 August 2026; Efa Arna).

This account supports an interpretation of evaluation as an emerging classroom practice: students questioned information credibility and assessed peers' arguments against Pancasila values. The observation checklist independently records the two corresponding behaviors at level 4. Nevertheless, the thesis does not reproduce students' source-verification steps or verbatim counterarguments. The evidence therefore supports the presence of the recorded behaviors, not a claim that every student consistently applied a formal fact-checking method.

Interpretation and analysis are represented through students' efforts to restate problems and connect cases with Pancasila values. In the bullying example, the teacher described students initially focusing on visible roles victim and perpetrator, before teacher prompts encouraged them to examine the underlying problem. The observation checklist marked both interpretation behaviors at level 4 and both analysis behaviors at level 3.

The teacher described the discussion of bullying as follows: *"At first, students tend to see the surface of the problem and focus on who is the victim and who is the perpetrator. After further discussion and prompting questions, they understand the problem more critically and the discussion becomes more reciprocal through questions and answers between the teacher and students."* (Interview, 10 August 2026; Efa Arna). The thesis further records that students were observed explaining and reformulating problems in their own words and relating violations to the Pancasila values involved.

Inference is supported by the teacher's account that students could connect causes, problems, and proposed solutions when drawing conclusions. The observation checklist marked the behavior of formulating logical and objective conclusions at level 3. This indicates that the behavior was recorded as frequent but sometimes with prompting; it does not justify describing inference as fully independent or uniform across the class.

Explanation is represented by students' attempts to defend a position and respond to counterarguments. The teacher stated that some students could restate their views with logical reasons and use facts from the case to support them. The observation checklist marked the ability to present a clear line of reasoning at level 4 and the ability to present an argument or solution with empirical evidence at level 3. Thus, the evidence is positive but also indicates that the use of evidence still required some prompting.

Taken together, the checklist ratings show variation among dimensions rather than a uniform level of critical thinking: interpretation was marked at level 4, analysis at level 3, evaluation at level 4, inference at level 3, and explanation included one behavior at level 4 and one at level 3. These are ratings recorded on the observation instrument, not student-level averages or standardized scores. Interview statements help explain the ratings, while the absence of reproduced student work limits independent examination of the reasoning itself.

Dimension / activity	Evidence in thesis	Observation checklist	Interpretation
Interpretation	Teacher: students could explain and reformulate a problem in their own words; prompts helped clarify meaning.	Two behaviors marked 4.	Strongest recorded level; evidence concerns restating and understanding the problem.
Analysis	Teacher: in the bullying case, students initially focused on surface roles, then discussed the underlying issue after prompts.	Two behaviors marked 3.	Frequent behavior, sometimes requiring prompting.
Evaluation	Teacher: students questioned news sources and assessed peers' arguments against Pancasila values.	Two behaviors marked 4.	Evidence of source-questioning and peer evaluation; a formal verification process is not reproduced.
Inference	Teacher: students connected causes, problems, and proposed solutions when drawing conclusions.	One behavior marked 3.	Conclusions were recorded but sometimes required guidance.
Explanation	Teacher: some students defended positions with logical reasons and facts from the case.	One behavior marked 4; one marked 3.	Presentation was recorded strongly; evidence-supported argumentation sometimes needed prompting.
Visual activity	Principal/teacher accounts describe attention to visual materials; checklist records focus on slides and videos.	First behavior marked 4; second item has no visible mark.	Visual attention is documented, but the second checklist item is incomplete.
Oral activity	Teacher: students asked, responded, and presented; confidence varied and some needed encouragement.	Two behaviors marked 4.	Oral activity was recorded strongly, but participation was not uniform.
Listening activity	Teacher: students listened, waited their turn, disagreed politely, and appreciated presentations.	Two behaviors marked 4.	Attentive listening was recorded; occasional lapses in concentration were also noted.
Writing activity	Teacher: students took notes and developed organized arguments; LKPD recorded ideas and solutions.	Two behaviors marked 4.	Written participation was recorded; student writing samples are not reproduced.
Motor activity	Students operated mobile phones to complete the interactive Zep Quiz.	One behavior marked 4.	Device operation is documented as motor participation, not by itself as evidence of cognitive learning.

Forms of Learning Activity and Variations in Student Participation

The learning-activity checklist and interview excerpts record five forms of participation. Visual activity was marked at level 4 for focusing on slides and videos; the principal also described students' attention and responses to visual materials. The second visual behavior is listed in the instrument, but no separate rating mark is visible for that item in the thesis copy.

Oral activity was recorded at level 4 for both asking/responding/arguing and presenting analysis or opinions. The teacher nevertheless emphasized differences in confidence: some students volunteered, while others needed encouragement and positive reinforcement before speaking. A high checklist mark should not be interpreted as identical participation by every student.

Listening activity was marked at level 4 for both attentive listening to teacher explanations and listening to peers' presentations. The teacher described students as generally respectful of different opinions, avoiding interruptions, disagreeing politely, and appreciating presentations, while acknowledging occasional lapses in concentration.

Writing activity was marked at level 4 for note-taking and for recording ideas, problem formulations, and solutions in the LKPD. The teacher also described students' written arguments as increasingly organized and coherent and connected to social issues familiar to adolescents. The thesis does not include anonymized samples of the written work, so the quality of individual texts cannot be independently assessed in this article.

Motor activity was marked at level 4 for using a mobile phone to complete the interactive Zep Quiz. This is evidence of device operation within the lesson, but motor participation should not be equated with cognitive engagement. The principal's and teacher's accounts also suggest that digital and visual elements helped maintain interest, although the study did not isolate the effect of the platform from teacher facilitation or the novelty of the medium.

The learning-activity evidence therefore shows a broad range of recorded classroom behaviors: visual attention, oral contribution, listening, writing, and operation of a device. Oral participation was described as uneven in confidence, and the visual checklist contains one unmarked item. These qualifications are retained so that the findings do not overstate uniform engagement.

The thesis also provides pre-test and post-test records for all 18 students, each based on 20 items. The class mean increased from 63.33 on the pre-test to 85.56 on the post-test, a descriptive difference of 22.22 points. Using the threshold of 75 recorded in the thesis, 6 of 18 students (33.33%) were classified as complete before instruction and 18 of 18 (100%) afterward. Because the study reports no control group or inferential analysis, these figures indicate a within-class score pattern and should not be interpreted as proof of causal effectiveness.

The interview, observation, and test evidence are complementary but not identical. Interviews describe how the teacher and principal understood classroom behavior; the checklist records ratings against specified behaviors; and the test tables summarize performance on a 20-item assessment. The article therefore avoids treating test-score changes as direct proof of all five critical-thinking dimensions or treating a checklist rating as a detailed transcript of students' reasoning.

Measure	Pre-test	Post-test	Descriptive change
Mean score (n = 18)	63.33	85.56	+22.22 points
Students meeting threshold (≥75)	6/18 (33.33%)	18/18 (100%)	+12 students

DISCUSSION

The findings are consistent with research that positions authentic problems and teacher facilitation as important features of PBL. Narmaditya et al., (2018); (Darmawati & Mustadi, 2023), and (Ermiana et al., 2025) examine PBL-related critical-thinking outcomes in different settings, while (Wilsa et al., 2017) examines problem-based learning around socioscientific issues and communication. These studies provide a comparative basis for interpreting the present classroom evidence, but their designs and subjects differ and should not be treated as direct replications.

The Relationship Between Problem Solving and Digital Quiz Support

The most defensible interpretation of the PBL–Zep Quiz combination is functional: PBL organizes learning around a contextual problem, while Zep Quiz provides an interactive quiz environment that can invite responses and sustain attention. The teaching module confirms that the quiz was planned as part of the problem-orientation stage. Teacher accounts and checklist entries indicate that students also engaged in discussion, explanation, and device-based activity. The data do not separate the independent effects of PBL, Zep Quiz, teacher prompts, or students' interest in a new medium.

The role of teacher facilitation is particularly visible in the bullying discussion. Students initially focused on surface features of the case, and prompting questions were described as helping them identify the underlying problem. This is consistent with the facilitative role discussed by (Marzuki & Basariah, 2017) and with PBL-based teaching materials in Pancasila Education examined by (Frima & Satria, 2025); (Suhaida et al., 2025) investigates citizenship education design through digital media. A quiz response becomes educationally meaningful when it is followed by a request to explain the reason, connect the case with civic values, and consider consequences.

The observation checklist provides a more differentiated picture than a general statement that critical thinking improved. Interpretation and evaluation behaviors were marked at level 4, while analysis and inference were marked at level 3; explanation included ratings at both levels. This pattern suggests that some behaviors were recorded as more independent than others. It is compatible with the distinction made by (Sailer & Homner, 2020)

between cognitive, motivational, and behavioral outcomes of gamification. The present study cannot determine whether the observed engagement resulted from game elements, teacher scaffolding, the social relevance of the cases, or a combination of these factors (Narmaditya et al., 2018).

Research on Quizizz, including (Astuti et al., 2021) and (Ekantini & Damayanti, 2023), is relevant only as adjacent evidence about digital quiz-based assessment and engagement. It does not establish the effectiveness of Zep Quiz, because the platforms and instructional settings differ. More directly relevant Zep Quiz studies include Fitri et al. (2025), who examine game-based evaluation in Informatics, and Mushfiroh and Mardliyah (2026), who examine learning interest in an elementary-school context. These studies support platform-specific inquiry, while the present article adds a different subject context and examines the platform as one component of PBL rather than as a stand-alone intervention.

The descriptive score pattern an increase in the class mean from 63.33 to 85.56 and an increase in the number meeting the stated threshold from 6 to 18 adds a useful performance context. Nevertheless, the thesis does not report a control group, random assignment, or inferential analysis. The score change may reflect the combined instructional sequence, content familiarity, teacher support, test exposure, or other contextual factors. It cannot be attributed solely to Zep Quiz, nor can it establish a causal effect of PBL.

Interpreting Indications of Critical Thinking in Pancasila Education

Questioning the credibility of social-media information is a meaningful civic-learning behavior because Pancasila Education addresses how citizens interpret information and respond to social issues. In this study, the teacher's account and the level-4 observation marks support the presence of source-questioning and peer-evaluation behaviors. They do not reveal a complete verification protocol or demonstrate that all students consistently distinguish misinformation from verified information.

Fathurrohman et al., (2025) provides a relevant comparison because it examines PBL in Pancasila/civics-related instruction and highlights the role of authentic problems and dialogue. The present findings similarly show the importance of connecting cases such as bullying with Pancasila values. The contribution is contextual: it shows how teacher prompts, problem discussion, and a quiz medium were brought together in one Grade IX classroom.

The distinction among interpretation, analysis, evaluation, inference, and explanation is useful because each requires different evidence. Restating a problem supports interpretation; linking bullying to a Pancasila value supports analysis; questioning a news source supports evaluation; connecting causes and solutions supports inference; and defending a position with reasons supports explanation. The observation checklist gives these behaviors ratings, but student work samples would be needed to examine the quality and consistency of individual reasoning in greater depth (Alfiandra et al., 2018); (Putra et al., 2026).

The interpretation of Wilsa et al. (2017) is corrected here: the study concerns PBL based on socio-scientific issues to develop critical thinking and communication in science learning, not mathematics and not a meta-analysis. It can be used as a comparative study of contextual problem-based learning, but differences in subject matter prevent direct generalization to Pancasila Education.

Wilsa et al., (2017) is a lesson-study investigation conducted through four cycles with senior high school students; it is not a meta-analysis. The original publication reports PBL implementation and critical-thinking activities in a specific school context. Its design and findings should therefore be represented accurately when comparing evidence (Narmaditya et al., 2018).

Sailer and Homner (2020), by contrast, is correctly described as a meta-analysis of gamification outcomes. The review distinguishes cognitive, motivational, and behavioral learning outcomes, which supports the present article's caution against treating quiz participation as a direct measure of critical thinking (Marzuki & Basariah, 2017).

The learning-activity checklist records high ratings for oral, listening, writing, and motor behaviors, while visual attention to slides and videos is also marked at level 4. These findings suggest that the lesson involved more than passive listening. However, the teacher's account of differing confidence levels shows why checklist marks should not be read as proof that every student contributed equally. Teacher facilitation remains central to distributing opportunities to participate (Triastuti, 2019); (Halimi et al., 2022).

Learning Activities and Differentiated Needs for Guidance

Variations in confidence indicate that using the same medium does not necessarily produce uniform participation. Students who do not speak spontaneously may require more time, support, or different opportunities. Conversely, frequent responses from active students do not reflect the participation of the entire class. This finding shifts attention toward the distribution of opportunities to express opinions, consistent with (Triastuti, 2019).

The checklist clarifies the distinction between activity and learning. Operating a phone to complete Zep Quiz is a motor behavior; attending to a slide is visual behavior; and writing in the LKPD is a written behavior. These actions create opportunities for learning, but their cognitive value depends on the content of students' responses and the reasoning they can explain (Tirza et al., 2025).

Wilsa et al., (2017) examines critical thinking and communication through PBL based on socio-scientific issues in science education. It is useful as evidence that authentic social issues can structure reasoning and communication, but it does not directly evaluate Pancasila Education or Zep Quiz.

For practice, teachers may use Zep Quiz as an entry point and then extend selected answers into dialogue: What evidence supports the answer? Which Pancasila value is relevant? Who is affected by the problem? What alternative explanation or solution is possible? These prompts are recommendations derived from the findings; they are not presented as verbatim activities documented in every observed session.

The specific contribution of this study is not a claim that a digital quiz automatically improves critical thinking. Rather, it maps how quiz-based participation, contextual problem solving, teacher prompts, and varied classroom activities co-occurred in one Grade IX Pancasila Education setting. Further studies should document student reasoning products and compare implementation across classes or instructional conditions.

Limitations of the Evidence and Transferability of the Findings

Several limitations should guide interpretation. First, the study concerns one class of 18 students in one school, so transferability depends on similarity of context. Second, although the thesis lists seven informants, the reproduced interview excerpts mainly represent the teacher and principal; the number and duration of interviews and full student interview transcripts are not specified.

Third, the observation instrument and its checklist marks are available, but the thesis does not provide a student-by-student observation dataset or an item-level narrative log. Ratings are therefore reported as recorded checklist levels, not converted into averages or participation percentages. The thesis also includes photographs and screenshots, but the article does not infer details that cannot be read from the documented captions and instrument.

Fourth, pre-test and post-test scores are available, but the thesis does not report an inferential test, a comparison group, or a validated measure for each of the five critical-thinking dimensions. The score pattern is descriptive and cannot establish causality. Written student work is not reproduced in sufficient detail to independently evaluate the quality of individual arguments.

Fifth, the thesis documents institutional research permission and a school completion letter, but it does not include a separate record of individual consent or student assent in the materials reviewed. It also explains the Miles–Huberman analytical model without a detailed coding audit trail or explicit cross-source verification protocol. These reporting gaps are stated transparently and are not filled with undocumented procedures.

Finally, the study does not isolate the effect of Zep Quiz from PBL, teacher facilitation, case relevance, or novelty. The findings should be understood as a contextual account of a combined instructional design. Future research can strengthen the evidence through session-by-session observation logs, anonymized student work samples, transparent coding records, documented participant-consent procedures, and comparative designs.

CONCLUSION

For classroom practice, the findings suggest using quiz responses as a starting point for follow-up dialogue and written explanation. Teachers may provide prompts that help students identify the root of a problem, justify the relevance of Pancasila values, assess evidence, and explain proposed solutions. Future studies should document student reasoning products and instructional sessions more systematically. In one Grade IX Pancasila Education classroom, the documented evidence shows that Zep Quiz-assisted PBL was associated with varied participation and recorded indicators of critical thinking. The observation checklist marked interpretation and evaluation behaviors at level 4, analysis and inference at level 3, and explanation at levels 3–4. Learning activities included visual, oral, listening, writing, and motor behaviors, with some variation in students' confidence to speak. The class mean test score rose descriptively from 63.33 to 85.56, while the number meeting the stated threshold increased from 6 to 18 students. These findings provide a contextual account of how PBL, Zep Quiz, and teacher guidance were combined; they do not establish a causal effect or general effectiveness.

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AUTHOR CONTRIBUTION STATEMENT

FA designed the study, developed the methodology, collected and analyzed the data, and prepared the initial draft. SA contributed to the literature search and verification of the analytical findings. HH contributed to editing and revising the manuscript.

AI DISCLOSURE STATEMENT

ChatGPT was used to assist with language editing, structural organization, reviewing the alignment of claims with evidence, and locating references during manuscript revision. Its use did not involve generating research data or new interview quotations. The authors are responsible for verifying the edited text, the accuracy of references, and the entire manuscript before submission for publication.

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