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Bridging Reflection and Critical Thinking: A Problem-Based Learning Approach to Digital Social Issues in Sociology Education

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Abstract: This study aims to analyze how integrating the Problem-Based Learning (PBL) model with stages of sociological thinking enhances students' ability to respond to real-world social issues in the digital era. The study used a mixed-method approach with a sequential explanatory design. The quantitative stage involved 89 grade XII social studies students at one of the State High Schools in Bandung who participated in PBL-based Sociology learning. Data were collected through an essay test that measured four indicators of sociological thinking: common issue, reflective thinking, creative thinking, and critical thinking. The analysis was carried out descriptively and correlatively. The qualitative stage is conducted through interviews to deepen and explain the quantitative findings. The results of the study showed variation in achievement between indicators and between classes. Reflective and critical thinking indicators show a higher tendency to achieve, while common issues exhibit greater variation in distribution. Correlation analysis showed positive relationships, with moderate-to-strong correlations among all indicators, particularly between reflective thinking and critical thinking. Qualitative data indicate that the reflective and creative stages serve as a cognitive bridge to critical thinking when responding to digital social issues. Sociological thinking develops into a structured, integrated process. The integration of PBL with the sociological thinking stage supports the formation of reflective, creative, and critical student responses to actual social issues in the digital era. These findings confirm the importance of systematic learning design in building students' social awareness and digital responsibility.

Keywords: building students' abilities, actual social issues, digital era, sociological thinking

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INTRODUCTION

Sociology subjects in schools play a strategic role in shaping students who are adaptable to social change and able to respond to the various social issues that arise. The current curriculum policy emphasizes that Sociology learning is not only oriented towards conceptual understanding, but also to foster students' critical awareness of the ever-changing social realities (Badan Standar Kurikulum dan Asessmen Pendidikan, 2025). One of the main focuses of the current study of Sociology is the change in people's behavior as a result of technological advances and digitalization (Badan Standar Kurikulum dan Asessmen Pendidikan, 2025). The era of digitalization has given rise to a digital society that gives birth to new patterns of interaction, shifting values, and contemporary social problems that demand students' ability to respond wisely, critically, and responsibly (Jamanbalayeva et al., 2025). Therefore, Sociology learning is required to be able to present a contextual learning experience, so that students not only understand theory, but also are skilled in analyzing and responding to the dynamics of social life in the digital era (Liu, 2025).

Recent studies show that teenagers in the digital age are increasingly faced with complex social problems (Amaliya et al., 2023; Sudrajat et al., 2023) One of them is the increasing

involvement in online lending practices (Pinjol) (Andriana et al., 2023; Hidayah et al., 2025; Muttaqin & Nuryanti, 2023). The digital deviant behavior is related to the tendency of addiction due to financial dependence and encourages adolescents to take loans as a form of escape from financial and psychological pressure (Hidayah et al., 2025; Marlina et al., 2025). This case of Pinjol was triggered by cultural shifts due to digitalization, such as lifestyle changes shaped by social media culture (Juwita et al., 2015). In particular, the emergence of hedonistic consumption patterns and the desire to flex or display a certain self-image in the digital space (Dinh & Lee, 2024; Lu et al., 2024; Rosida et al., 2023). The phenomenon of online lending in this context is not positioned as an object of study of adolescent behavior, but rather as an example of real social issues that reflect the complexity of social problems students face in their daily lives in the digital era. The digital image built up on social media creates pressure on teenagers to follow pseudo-living standards, leading to involvement in irresponsible financial practices. This situation shows that the main challenge lies in students' ability to understand, interpret, and respond to digital social issues rationally and responsibly.

The phenomenon of lending not only reflects weak self-control but also gaps in social awareness, ethical reasoning, and reflective thinking in understanding the broader social consequences of digital behavior. This indicates that there is a problem in the formation of students' social way of thinking, not solely in the deviant behavior that appears on the surface. In fact, the Curriculum Standards Agency explicitly emphasizes the importance of mastering sociological thinking skills as one of the main competencies in Sociology subjects (Badan Standar Kurikulum dan Asessmen Pendidikan, 2025). A person is said to be able to think sociologically when he or she can see and analyze everyday phenomena, relate personal experiences to social contexts, and be critical of assumptions that are considered normal (Ruggierro, 1996). A person with sociological thinking skills can control personal biases, demonstrate intellectual empathy, and be ready to continuously reevaluate their beliefs and perspectives. This ability is not an innate talent, but a habit that can be learned and developed through the practice of reflective, creative, and critical thinking in analyzing social issues (Ruggierro, 1996).

The results of the literature mapping show that research on sociological thinking continues to develop in the field of Sociology Education. Several studies confirm that sociological thinking is an important cognitive competency that helps students relate individual experiences to social structures and critically understand the dynamics of people's lives (Cant et al., 2020; Jacobs & Malpas, 2022; Taylor et al., 2022). Several studies have also shown that learning experiences that prioritize sociological thinking skills can broaden students' critical awareness and foster social reflection (Gallati, 2022; Hawa & Wardani, 2019; Plava, 2024). However, studies that specifically discuss how sociological thinking skills are developed as a gradual cognitive process through structured learning designs to address real social issues in the digital era remain relatively limited. Previous research generally treats sociological thinking as an orientation to learning outcomes, rather than as a thought process that is consciously trained through a specific learning syntax.

In contrast to the existing critical sociology learning approach, this study positions sociological thinking not only as a learning objective but also as a cognitive framework explicitly integrated into each stage of the Problem-Based Learning (PBL) syntax. In this study, the problem identification stage in PBL focuses on building awareness of common social issues, and the problem investigation stage involves reflective and creative

thinking to understand the relationship between personal experience and social structure. In contrast, the solution analysis and evaluation stage is focused on developing critical thinking about the social consequences of a phenomenon. Thus, the combination of PBL syntax and sociological thinking stages yields a more systematic learning framework that gradually builds students' social thinking processes, rather than merely encouraging general critical discussions as in the previous learning model.

The literature also shows that the Problem-Based Learning (PBL) model is a learning model whose structure aligns with the stages of sociological thinking. Several studies have shown that PBL can foster students' critical thinking skills, train them to analyze social realities, connect personal experiences with the context of society, and increase sensitivity to the dynamics of social change (Ardiansyah et al., 2024; Ismail et al., 2023; Mulyanti et al., 2024; Prastiwi et al., 2025). In Ruggiero's perspective, sociological thinking skills ideally develop through several stages of thinking that include common issues as well as the thinking process (reflective, creative, and critical) (Ruggierro, 1996). In the context of digital social issues faced by adolescents, these stages serve as a framework for building students' ability to recognize, interpret, and evaluate real-world social phenomena responsibly.

Based on this framework, this study aims to analyze how applying the PBL model, combined with sociological thinking stages, can build students' reflective, creative, and critical skills in responding to digital social issues related to online lending (pinjol) among adolescents. The issue of online loans was chosen because it represents the complexity of digital social issues that are close to students' lives, involving interactions among social media cultural pressures, digital consumption patterns, and risky economic decision-making. Through the context of online lending problems, this study seeks to examine how students identify digital social phenomena, relate them to broader social structures, and evaluate the social consequences of these behaviors through a structured sociological thinking process.

The PBL model was chosen because its learning process, which starts with problem identification, aligns conceptually with the common issue stage in sociological thinking, thus allowing the issue of online loans to serve as a starting point for learning that builds students' awareness of the digital social reality they face. This alignment makes PBL relevant for building sociology learning oriented to contemporary social issues as the core of the learning process.

METHOD

Participants

This study involved 89 students in grade XII of the Social Sciences (IPS) program at SMA Negeri 4 Bandung. All students who took the Sociology subject in the research semester were included as participants, so the research used a total sampling technique. Participants came from three classes with relatively comparable academic characteristics, as indicated by sociological report cards from the previous semester.

Participants were aged 16–18 years. Based on school information and preliminary interview results, most students come from middle-class socioeconomic backgrounds and have adequate access to digital devices, such as smartphones and the internet. All students actively use social media, especially visual-based platforms and online communication, so they have a high level of exposure to digital culture.

The selection of all classes as participants was based on research objectives focused on mapping students' sociological thinking abilities in responding to digital social issues overall, rather than on comparisons between treatment groups.

Research Design

This study uses a mixed-method approach with a sequential explanatory design. In this design, quantitative data collection and analysis are conducted first to map the patterns of students' sociological thinking skills, followed by qualitative data collection to explain and deepen the quantitative findings.

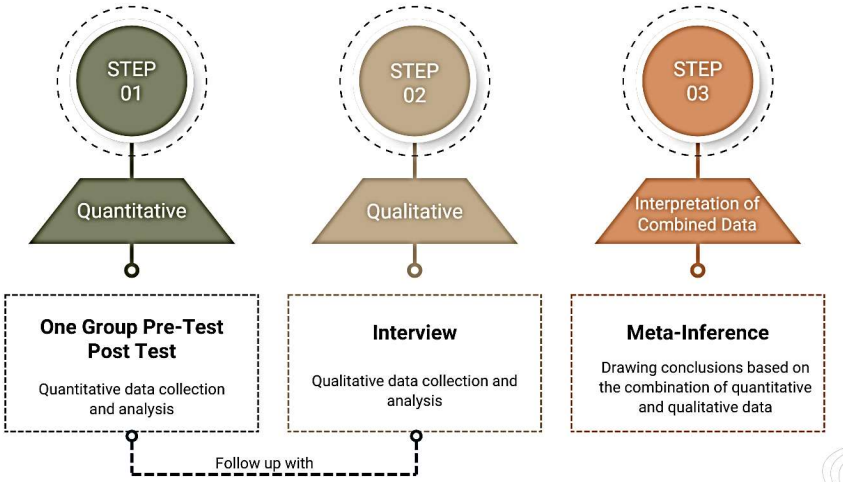

Figure 1. Research implementation procedures

The research used a single-group posttest-only design. The research was conducted without a control group or a pre-test. This design was chosen because the research focuses on mapping the patterns of students' sociological thinking abilities after participating in the learning intervention. Therefore, the study does not aim to test the comparative improvement of learning outcomes or to draw causal conclusions about the effectiveness of learning treatments. The measurement of students' abilities is carried out through a final test (post-test) after the entire series of Problem-Based Learning has been completed, integrated with the sociological thinking stages.

The limitation of the design, without a pre-test and control group, is the research's inability to directly ascertain changes in students' abilities resulting from the learning treatment. Therefore, the results of the study are interpreted as illustrating the pattern of students' sociological thinking abilities after participating in PBL-based learning integrated with the sociological thinking stages, rather than as evidence of cause-and-effect relationships.

Research Procedure

The learning process in this study is designed using the Problem-Based Learning (PBL) model combined with the stages of sociological thinking. Learning begins with the presentation of real social issues relevant to students' lives in the digital era. Furthermore, students are directed to identify social problems, make reflective interpretations of issues, develop creative ideas or responses, and critically evaluate the arguments and information that arise. After the entire learning series is completed, students take the essay test as a post-test.

The integration of the PBL model with the sociological thinking stage aims to encourage students not only to understand sociological concepts theoretically but also to apply sociological thinking methods in responding to social phenomena they encounter in their daily lives, especially through digital media.

Research Instruments

The main instrument used in this study is an essay test designed to measure students' ability in sociological thinking. The development of the

instrument is based on the sociological thinking framework proposed by Ruggiero (1996), which encompasses the ability to recognize common social issues, as well as reflective, creative, and critical thinking. These four components serve as the basis for preparing question items and rubrics to assess students' sociological thinking skills.

The instrument consists of seven essay questions arranged in the same social issue context. Each question item is designed to represent the stages of sociological thinking with different levels of complexity. The distribution of question items and score weights in each indicator is presented in Table 1.

Table 1. Distribution of question items and sociological thinking assessment weights

Questions	Indicator	Complexized	Score Weights
Question 1	Common Issue	Basics	10
Question 2	Thinking Reflective	Intermediate	10
Question 3	Thinking Reflective	Intermediate	10
Question 4	Thinking Creative	Medium–high	15
Question 5	Thinking Creative	Medium–high	15
Question 6	Thinking Critical	Height	20
Question 7	Thinking Critical	Height	20
Total			**100**

The structure shows that each indicator has a different weight based on the complexity of the measured thinking ability. Common issue indicators carry less weight because they focus on basic abilities for recognizing and formulating social problems. In contrast, the indicators of reflective, creative, and critical thinking carry greater weight because they entail a more complex process of social analysis.

This difference in weight is intended to reflect the variation in the difficulty level of the measured indicators, so that the score distribution is more representative of the student's overall sociological thinking ability. The indicator used to measure sociological thinking ability in this study is based on the framework developed by Ruggiero (1996). Descriptions of operational indicators and examples of test items are presented in full in the supplementary materials so as not to interfere with the main focus of the article on the analysis of research results.

Table 2. Examples of sociological thinking instrument questions

No	Indicator	Sample Questions
1	Common Issue	Based on the phenomenon of information dissemination on social media, explain the main social issues that arise and how digital globalization contributes to their emergence.
2	Thinking Reflective	Identify the parties likely to benefit from and be disadvantaged by the phenomenon. Explain the social reasons underlying each party's position.

The two question items are designed to encourage students to identify social issues as collective problems and reflect on the relationships of social interests that arise in digital social phenomena. Examples of complete question items are presented in the supplementary materials.

Students' essay answers are assessed using analytical rubrics on a 1–4 scale, compiled based on *sociological thinking constructs*. Each

answer is assessed based on the depth of understanding, relevance of argumentation, and students' ability to relate social issues to the broader social context. In general, scores are given based on the following criteria:

The use of analytical rubrics aims to maintain the consistency and objectivity of assessment of students' essay answers (Brookhart, 2013; Moskal & Leydens, 2000). To increase the transparency of assessment, analytical rubrics are also prepared specifically for each indicator of sociological thinking ability, such as common issues, reflective thinking, creative thinking, and critical thinking. A complete rubric description for each indicator is presented in the supplementary materials. The final score for students is obtained by summing the scores across all indicators, then calculating the average for each indicator and per class. Before statistical analysis, the score is normalized to a 0–100 scale to enable comparison of scores across indicators with different weights.

Table 3. Description of the rating scale

Score	General Description
4	The answer demonstrates in-depth social analysis, relates phenomena to a broader social structure, and provides logical and relevant arguments.
3	The answers show a fairly good understanding of social issues and provide reasonable explanations, but the social analysis remains limited.
2	The answer remains descriptive, merely mentioning the phenomenon without a clear explanation of social relations.
1	Answers are normative or subjective without relevant social analysis.

This research instrument has gone through an expert review process involving two sociology education lecturers and one experienced sociology teacher. Validation is conducted to ensure the suitability of the constructs, the clarity of the language, and the measurability of the targeted thinking skills. The validation results show that the instrument is considered suitable for use in the context of the research.

Instrument trials were conducted with students outside the research sample. The reliability test showed a Cronbach's alpha of 0.87, indicating high reliability. The assessment of essay answers is carried out by two independent assessors using the same rubric. The inter-rater reliability test showed a coefficient of agreement of 0.82, indicating excellent consistency in assessment.

Data Analysis Techniques

Data analysis was carried out in two stages, following a sequential explanatory design. All statistical analyses in this study were carried out using RStudio to ensure the accuracy of data calculations and visualization. In the first stage, the quantitative data from the essay test results were analyzed. The first stage uses descriptive statistics to characterize the distribution of students' sociological thinking abilities across indicators and classes. The second stage uses inferential statistical analysis, specifically One-Way Analysis of Variance (ANOVA), to test whether sociological thinking scores differ across classes. If significant differences are found, the analysis is followed by the post hoc Tukey HSD test to identify specific class-pair differences. In addition, effect size was calculated using eta squared ($ç^2$) to determine the magnitude of the influence of class variables on the variation in students' sociological thinking scores. Dependent as well as common issues, reflective thinking, and creative thinking are predictive variables to identify the most powerful indicators predicting students' critical thinking skills. These quantitative

findings then became the basis for selecting informants and for preparing the focus of the qualitative exploration.

In the second stage, qualitative data were collected through semi-structured interviews with 12 purposively sampled students. The selection of informants is based on test score variation, with high, medium, and low categories, to ensure a diversity of perspectives.

Qualitative analysis was carried out using an inductive-reflective thematic analysis approach. The analysis process includes: (1) verbatim transcription of all interview results, (2) open coding to identify units of meaning related to students' responses to digital social issues, (3) grouping codes into initial categories such as "need to understand context", "initial confusion", and "assessment delay", and (4) withdrawal of key themes that represent general patterns in how students respond to actual social issues.

To maintain consistency in interpretation, the coding process is repeated by comparing transcripts (constant comparison). Quotes presented in the discussion section are selected based on their representativeness of themes that appear consistently in multiple interviews, not as a single case or exception. The results of the qualitative analysis are then integrated with quantitative findings to clarify the dynamics of students' thought processes, not to test causal relationships, but to enrich the interpretation of the patterns that have been statistically identified.

■ RESULT AND DISCUSSION

Distribution of Students' Sociological Thinking Ability Scores

The results of a descriptive analysis of students' sociological thinking skills after the implementation of PBL-based learning showed variation in achievement across indicators and between classes. This analysis was conducted to identify the profile of students' ability to recognize social issues, reflect, develop ideas, and critically evaluate them in the digital era. A summary of the average achievement of each class and each indicator is presented in Figure 1.

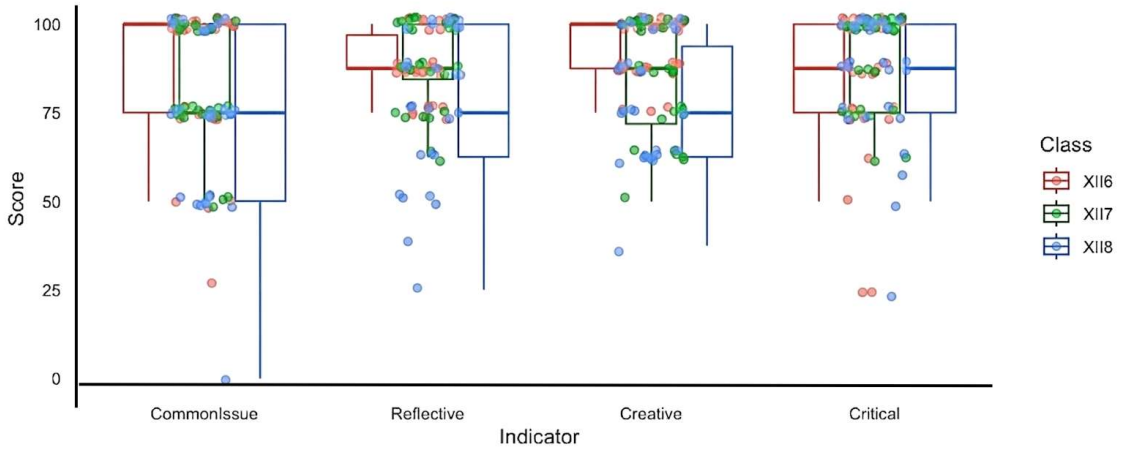

Figure 2. Distribution of students' sociological thinking ability scores

The results of the analysis showed that class XII 6 had the highest average sociological thinking score (M = 88.14), followed by class XII 7 (M = 86.83), while class XII 8 showed the lowest average (M = 77.85). This difference shows that there is variation in students' ability to respond to real social issues, even though all classes follow the same learning plan. The relatively high achievement in grades XII 6 and XII 7 shows that most students have developed sociological thinking skills through reflection, exploration of ideas, and evaluation of the various social information discussed during learning.

Meanwhile, lower achievement in grade XII 8 shows that students' sociological thinking skills develop at different levels between classes.

However, the pattern of score distribution still shows a similar trend, with indicators of reflective and critical thinking relatively more prominent than those for identifying social issues in the early stages of analysis. This shows that students are more likely to develop reflective and evaluative arguments after social issues are discussed in class, compared with the early stages of identifying and framing them analytically.

The differences in achievement between classes show that the development of sociological thinking skills is influenced not only by the same learning design but also by the dynamics of class discussions, the level of student participation, and students' initial experience in understanding social issues circulating in the digital space. To determine whether the variation in sociological thinking scores across classes is statistically significant, a One-Way ANOVA was conducted with class as the independent variable and total sociological thinking score as the dependent variable.

Table 4. One-Way ANOVA sociological thinking score results by class

Source	df	Sum of Squares	Mean Square	F	p
Class	2	1797.4	898.7	5.05	0.008
Error	86	15291.3	177.8		
Total	88	17088.7			

The results of the analysis showed a significant difference between classes, $F(2.86) = 5.05$, $p = 0.008$. Follow-up analysis using the Tukey HSD test showed that significant differences were primarily observed between the class with the highest average score and the class with the lowest. Descriptively, class XII 6 showed the highest average sociological thinking score ($M = 88.14$), followed by class XII 7 ($M = 86.83$), while class XII 8 had the lowest average ($M = 77.85$). The effect size calculation showed an eta squared ($ç^2$) of 0.11, indicating a moderate effect on variation in sociological thinking skills between classes in this study.

The variation in achievement between classes is evident not only in the distribution of scores in the boxplot visualization but also statistically confirmed by the One-Way ANOVA, which shows significant differences between classes. This shows that even though all students follow the same learning pattern, the abilities that emerge are not completely uniform. This condition shows that the equality of learning experiences is not always reflected in uniformity of achievement, because the development of sociological thinking skills is also influenced by the dynamics of class interaction, the level of student participation, and the thinking habits that develop during the learning process.

These findings are also reflected in the students' experiences during the classroom discussion process. Some students explained that the dynamics of group discussions affect how they develop arguments and understand the social issues being discussed.

"*We are used to discussing and corroborating each other's arguments." (KS, XII 7)*

The results of the quantitative analysis were strengthened by the findings of observation during the learning process. Observations show that the dynamics of discussion and the level of student participation differ across classes, even when they use the same learning plan. Classes that show *higher levels of sociological thinking tend to be more active in discussion, with more equal student involvement* in expressing opinions and responding to arguments. In contrast, in classes with relatively lower achievements, discussions tend to be more focused on a small percentage of students with uneven participation.

The differences in learning dynamics can be seen to affect how students respond to the social

issues discussed. In classes with more active discussions, students seem more accustomed to expressing opinions and evaluating the information they obtain, so reflective and critical skills appear more often in the discussion process. Meanwhile, in classes with more limited participation, students tend to take longer to develop an understanding of the social issues being discussed. The findings of this observation show that although the learning design used is relatively similar, the classroom interaction process contributes to variation in students' sociological thinking ability achievements.

When indicators are reviewed, the average achievement score tends to increase from common-issue indicators to critical-thinking *indicators*. The *critical thinking* indicator had the highest average score (83), followed by *reflective thinking* and *creative thinking,* each at 79, and common issues at 76. This pattern of achievement shows a tendency for students to be more likely to develop reflective and critical arguments than in the early stages of identifying social issues. Although the average scores on the reflective and critical indicators were relatively high, the regression results showed that the ability to identify social issues remained an important foundation supporting the development of students' critical thinking skills. This shows that the critical evaluation process does not appear in isolation, but is rooted in the student's initial ability to recognize and frame the social issues discussed.

Overall, the score distribution in Figure 1 shows that students' *sociological thinking* skills develop at varying levels of achievement across indicators and classes. These variations reflect differences in how students understand and respond to real social issues in the context of problem-based learning, and show that sociological thinking skills do not emerge as uniform skills but develop through processes shaped by learning experiences and the dynamics of classroom interactions.

Variation in the Distribution of Students' Sociological Thinking Abilities

To obtain a deeper picture of the distribution of sociological thinking skills, the analysis focused not only on the average achievement but also on the distribution of scores among students. This distributional variation is important for identifying the level of heterogeneity in the ability to recognize social issues, reflect on phenomena, develop ideas, and conduct critical evaluations of actual social issues in the digital era. Through distribution analysis, it can be found whether students' abilities develop evenly or still show inequality between individuals. The distribution of these capabilities is shown in the following image.

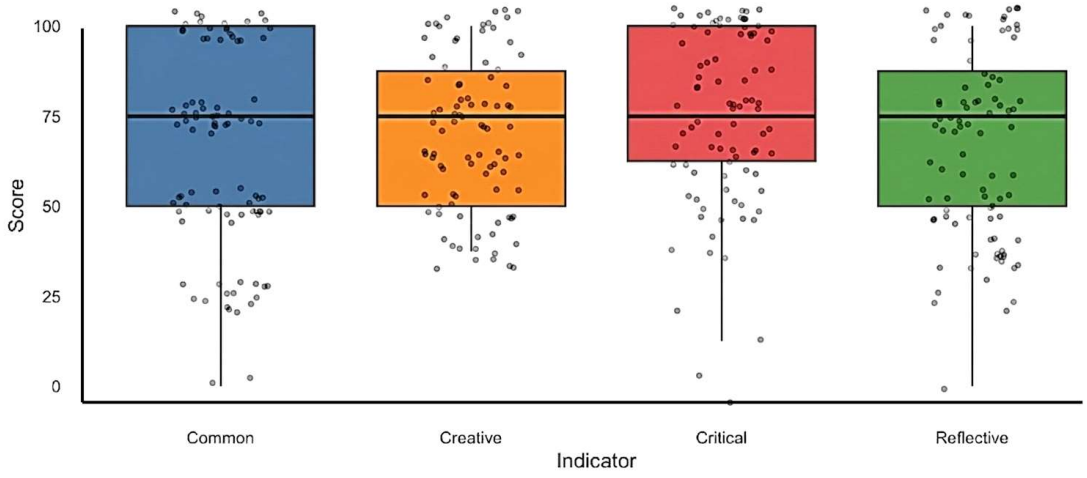

Figure 3. Distribution of students' sociological thinking abilities

Based on the results of the boxplot visualization, students' sociological thinking abilities showed significant variation in score distributions across indicators, reflecting the heterogeneity in how students understood and responded to actual social issues. Reflective and critical thinking indicators generally show higher median scores than common issue and creative thinking indicators. These findings indicate that most students have relatively good reflective and critical capacities, although these abilities are not evenly distributed among all students.

The width of the interquartile range for each indicator indicates the degree of variation in ability among individuals within a class. Some students achieve high scores close to the maximum, while others are still in the low category. This condition can be related to the social reality of adolescents in the digital era, where access to information, social experiences, and the ability to manage the flow of digital information vary between students. Thus, sociological thinking does not develop linearly, but is influenced by the complexity of the student's social and cultural background.

However, when viewed more specifically, the relatively wider interquartile range in the common issue and creative thinking indicators indicates that the influence of PBL interventions is not evenly distributed across both aspects. In the common issue indicator, the ability to identify and frame social issues is strongly influenced by students' initial capital, such as exposure to social discourse, habits of following public issues, and digital literacy before learning begins. These differences in social background and experience lead some students to quickly recognize the structure of social problems, while others are still at the stage of simple identification.

These findings are reflected in the students' experiences during the learning process. Some students explained that finding social issues is relatively easy because they are accustomed to following various public issues in digital media. Khansa (XII 7), for example, explained that the issues he raised could develop into various branches of social discussion.

"It just flows. Not too difficult. There are many issues that I have raised in the branches, such as pedophilia, cyberbullying, and child grooming." (KS, XII 7).

In contrast, some students have difficulty in the early stages because they are not used to associating the information they find with the framework of social analysis. One of the students in class XII 8 explained that his group had experienced confusion in determining which issue to discuss.

"*We are confused about how to remain neutral but still be able to convey the group's position." (RN, XII 8)*

Meanwhile, in the creative thinking indicator, the wide variation in scores can be attributed to differences in participation in group discussions, the courage to put forward ideas, and prior experience formulating alternative solutions. PBL-based learning that emphasizes group work allows the emergence of the dominance of certain students in the process of formulating ideas, so that the development of creative abilities does not always develop in a balanced manner among all group members.

These findings are also seen in the dynamics of group discussions during the learning process. Some students can develop ideas by considering the various perspectives that arise in the discussion. Students from class XII 6 explained that the policy revision process encouraged their group to adjust their arguments after hearing other groups' views.

"We have to listen to other parties' arguments, understand their concerns, and then adjust our arguments to stay relevant." (WD, XII 6)

However, not all students are actively involved in the process of developing ideas. Some students play more of a role as listeners or recipients of group decisions. The student from class XII 8 explained that, in his group, he followed more of the ideas proposed by other members.

"The idea of the Son. I just agreed after it was explained." (RZ, XII 8)

These findings do not necessarily indicate that PBL is ineffective; rather, they suggest that its effectiveness is stronger on the reflective and critical dimensions than at the stage of early issue identification and creative solution construction. Thus, it is necessary to strengthen the early stages of framing issues and scaffolding the process of constructing ideas so that the development of sociological thinking skills can proceed more evenly.

The integration of the results of the score distribution with students' experiences shows that variation in sociological thinking skills is influenced not only by the learning design but also by students' initial understanding of social issues and the dynamics of interaction in the discussion group.

Structural Linkages between Sociological Thinking Indicators

The color scale shows the strength of the correlation between the indicators. Light colors represent a low correlation (0.00–0.29), medium

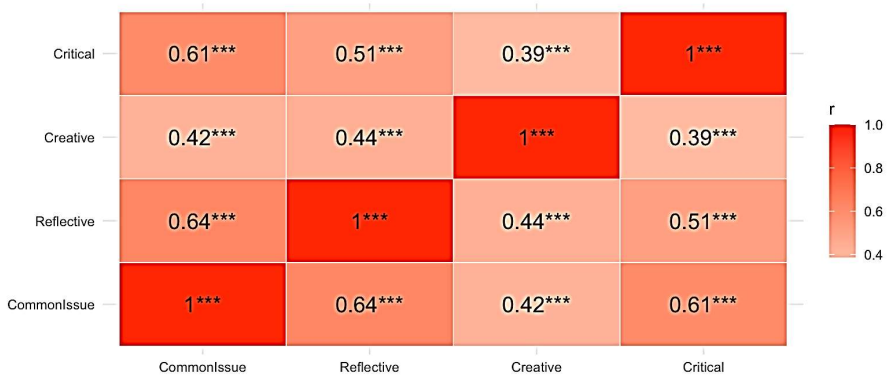

Figure 4. Structural linkages between sociological thinking indicators

colors indicate a moderate correlation (0.30–0.59), and dark colors indicate a strong correlation (0.60–1.00). The darker the color, the stronger the relationship between the indicators.

The results of the correlation analysis between indicators showed that all aspects of sociological thinking were positively related, with moderate-to-strong correlations. Correlation values are interpreted based on the general categories of relationship strength: 0.30–0.59 is moderate, and values above 0.60 are strong. The most prominent relationships were observed between common issue and reflective thinking ($r = 0.64$) and between common issue and critical thinking ($r = 0.61$). In addition, the relationship between reflective thinking and critical thinking ($r = 0.51$) was moderate, indicating a link between the reflective process and students' critical evaluation. All relationships between indicators were statistically significant and positive ($p < 0.001$).

This pattern of relationship is also reflected in the students' learning experiences during the discussion process and the classroom session simulation. Some students explained that understanding social issues often develops through discussions that encourage them to

evaluate various argumentative positions before forming an attitude.

"We skim those articles in the discussion activities, which ones support our group and which ones do not." (RD, XII 7)

This statement shows that reflecting on various arguments is an important step before students conduct a critical evaluation of the issue under discussion.

Conceptually, this pattern of correlations indicates a consistent relationship among indicators of sociological thinking, although it does not directly prove the existence of an integrated developmental process.

These findings suggest a tendency that students' ability to recognize and understand actual social issues is related to variations in their reflective and evaluative abilities. The relationship between the ability to recognize social issues and the reflection process is also evident in students' learning experiences. Students who can identify issues more comprehensively tend to have more room for reflection when discussing the various social dimensions of the issue.

"*There are many issues that I have raised in branches, such as pedophilia, cyberbullying, and child grooming. So it can be discussed from many sides." (KS, XII 7)*

The statement shows that the ability to recognize the structure of social issues opens up space for students to develop reflection on various interrelated social aspects.

These findings suggest that students who can identify the structure of social issues more comprehensively tend to have more room for reflection when analyzing the various perspectives that emerge in the discussion, ultimately supporting the development of critical evaluation of the issues discussed.

Reflectivity as an Axis of Critical Thinking for Adolescents

The relationship between reflective thinking and critical thinking, as shown in the scatter plots,

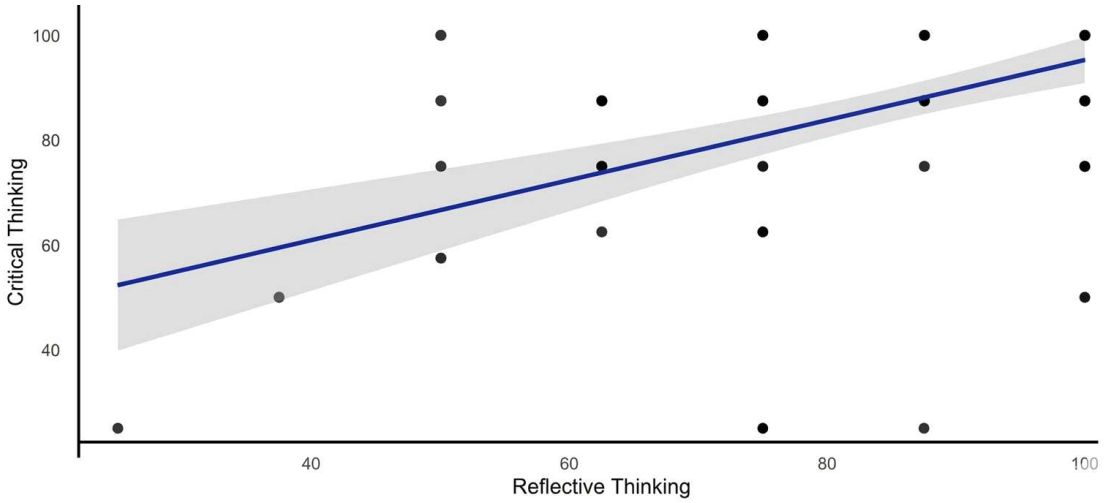

Figure 5. Scatter plot showing the relationship between reflective thinking and critical thinking

exhibits a consistent positive linear association. The higher the student's reflective ability, the higher the tendency to think critically. The regression lines on the graph show a steady upward trend within the 95% confidence interval. At the same time, the coefficient of determination ($R^2 = 0.41$) indicates that about 41% of the variation in critical thinking ability is explained by students' reflective

thinking. This pattern suggests that reflectivity is positively associated with critical thinking ability in bivariate analysis, and thus can be considered an important component in the development of adolescent social evaluation.

This relationship is also seen in the students' experiences during the discussion process and the simulation of the class session. Some students explained that the process of understanding the various arguments that emerged in the discussion prompted them to reconsider the group's position before making a decision.

"During the revision session, we have to listen to the arguments of other groups, understand their concerns, and then adjust our arguments to stay relevant." (WD, XII 6)

This statement shows that reflecting on the other party's arguments is an important mechanism for developing students' critical evaluation skills on the issues discussed.

In the context of digital social issues, reflectivity allows students not only to react spontaneously to the information they receive but also to consider the social context, the interests involved, and the issue's social implications. This ability is very important amid phenomena such as hoaxes, opinion polarization, and viral culture, which often encourage adolescents to be reactive rather than engage in deep thought.

Although the scatter plot shows a positive relationship between reflective thinking and critical thinking skills, the visualization does not comprehensively explain which indicators contribute most to students' critical thinking skills simultaneously. Therefore, the analysis continued with multiple regression to identify the sociological thinking indicators that most strongly explain variation in critical thinking skills.

The results of the multiple regression analysis showed that the overall model was statistically significant ($F(3.85) = 19.63$, $p < 0.001$), with a determination coefficient (R^2) of 0.41. This shows that approximately 41% of the variation in students' critical thinking skills is explained by three sociological thinking indicators: common issue, reflective thinking, and creative thinking.

Partially, the common issue indicator showed a significant influence on students' critical thinking skills ($B = 0.37$, $p < 0.001$). Meanwhile, the indicators of reflective thinking and creative thinking did not show a statistically significant influence. Standardized beta coefficient analysis showed that common issues were the strongest predictors of students' critical thinking skills ($\hat{a} = 0.44$) compared to other indicators.

Table 5. Multiple regression predicting critical thinking

Predictor	B	Std. Error	Beta	p
Common Issue	0.37	0.09	0.44	<0.001
Reflective Thinking	0.20	0.12	0.18	0.112
Creative Thinking	0.14	0.11	0.12	0.211

Note: Model fit: $F(3.85) = 19.63$, $p < 0.001$, $R^2 = 0.41$

These findings show that the ability to recognize and frame social issues is an important foundation for developing a reflective process that ultimately supports the emergence of critical evaluation of social phenomena. Thus, within the framework of sociological thinking, the ability to understand social issues not only serves as the initial stage of analysis but also provides a cognitive foundation for developing critical assessments of social reality in the digital era.

Students' experiences during class discussions also show that critical evaluation often arises after students compare the various argumentative positions that develop in the discussion.

"We skim those articles in the discussion activities, which ones support our group and which ones don't." (RD, XII 7)

The process of comparing and evaluating these arguments demonstrates how reflecting on diverse information encourages students to make critical assessments of the issues discussed.

Comprehensive Relational Patterns in Sociological Thinking

After mapping the achievement and distribution of sociological thinking skills, the next analysis focuses on the relationship among indicators as a single structure of social thinking. The study of the relationship between these indicators is important for understanding how the ability to recognize social issues, think reflectively, think creatively, and think critically is interconnected in shaping students' responses to real social issues in the digital era. Correlation analysis is used to test whether these indicators develop separately or form a systematic pattern of linkage as an integrated sociological thinking stage.

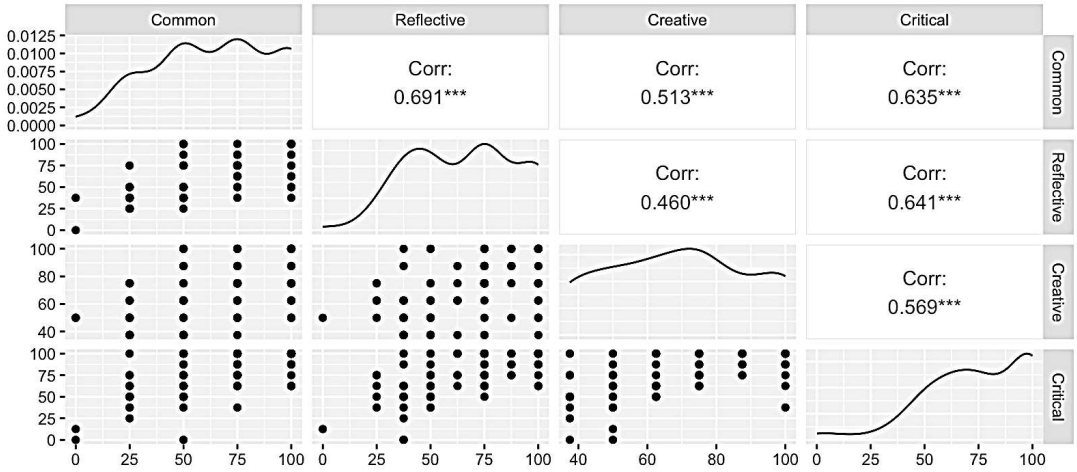

Figure 6. Relationship of all indicators

A comprehensive relationship analysis between indicators shows that common issues, reflective thinking, creative thinking, and critical thinking form a network of positively interconnected relationships. The correlation values indicated a relatively strong relationship between common issue and reflective thinking (r = 0.64) and between common issue and critical thinking (r = 0.61). In contrast, the relationship between reflective thinking and critical thinking was moderate (r = 0.51). These findings show that the ability to recognize social issues is closely related to students' critical reflection and evaluation processes.

The pattern of relationships among these indicators is evident not only in quantitative analysis but also in students' experiences during the class discussion. Some students explained that as they begin to understand the issue under discussion, the discussion process encourages them to consider various perspectives before formulating a stance.

"Initially, there were parties that were not in harmony with us. But after they elaborated, we realized that it was actually not much different. So we finally agreed." (WD, XII 6)

This statement suggests that understanding the issue, reflecting on the arguments that arise in the discussion, and adjusting the group's position become part of the social thinking process that develops gradually through class interaction.

Sociologically, these findings confirm that students' ability to respond to real social issues is determined not only by cognitive knowledge but

also by the reflective and critical abilities developed through their social interactions and digital experiences. Thus, *sociological thinking* can be understood as a framework that develops through a gradual process involving the identification of social issues, reflection on various perspectives, the development of alternative ideas, and the critical evaluation of the social realities adolescents face in the digital era.

Patterns of Students' Ability to Respond to Actual Social Issues in the Digital Era

The results of this study show that students' ability to respond to real social issues in the digital era develops through a gradual, context-dependent pattern of thinking. The variation in achievement across sociological thinking indicators indicates that students do not necessarily make an immediate critical assessment when dealing with digital social issues, but rather interpret and explore ideas first. This pattern is reflected in the variation in achievement between indicators, where critical thinking skills show a relatively high average score, but are still followed by reflective and creative achievements that are not much different. These findings reinforce the view that sociological thinking is not an innate ability but a cognitive process that develops progressively through the stages of social understanding, interpretation, and evaluation (Gallati, 2022; Go, 2020).

These quantitative findings were reinforced by interview data analyzed using a thematic approach on the theme of "reflection before evaluation," which appeared consistently across several interviews, especially among students with high reflective score achievements. One of the students explained the difficulties they experienced when trying to formulate a position on the social issues being discussed:

"We are confused about how to remain neutral but still be able to convey the group's position." (RN, XII 8)

This statement shows that for some students, the reflective process serves as a strategy to manage the complexity of information before taking an evaluative position. This finding becomes interesting when read alongside quantitative data showing that the common issue indicator score is lower than that of the reflective indicator.

This condition indicates that the ability to recognize and frame social issues has not been optimally developed. This difficulty is also evident in students' experiences during the learning process, as some students report that the initial stage of identifying social issues is the most challenging because they must understand the problem's context before they can develop an argument.

"Those who are looking for the news are the ones who are difficult." (RZ, XII 8)

This statement shows that identifying social issues requires the ability to read the broader context of information. Before formulating an argumentative position, students need to first understand the structure of the social problems being discussed. These findings suggest that students' main difficulty lies not in evaluating arguments, but in the early stages of identifying and framing social problems analytically.

These qualitative results illustrate that reflection acts as a stabilizing mechanism when students are not yet fully confident in mapping the context and social dimensions of the issues they face. These findings are in line with the study by Bashi (2023) which emphasizes that reflective abilities in sociological thinking act as a space for "postponement of judgment", so that individuals are not trapped in emotional or reactive responses to social phenomena that appear in digital media. In this context, sociological thinking does not work as an instant response, but rather as a process of meaning that distances students from the rapid and often contradictory flow of digital opinion (Bhambra, 2024).

In addition to being reflective, the interview data also revealed that students view the creative thinking stage as a space to develop the possibility of social responses without high evaluative pressure. One student said:

"At that stage, we are free to convey ideas, whether from our own experiences or from what we see on social media. Not afraid of being wrong." (NL, XII 6)

These findings confirm the results of the study by Gallati (2022) and Hisyam (2023) which states that creativity in sociological thinking is not solely about the innovation of ideas but also about the ability to imagine various social possibilities and to view issues from diverse perspectives. In the context of the digital era, the creative stage allows students to connect personal experiences, social media exposure, and structural reality as initial materials in understanding complex social issues. Thus, creative thinking serves as a bridge between reflective meaning and deeper critical evaluation.

The important role of the reflective and creative stages in this study can also be understood as an adaptive response to the characteristics of digital society, characterized by the speed of information and the fragmentation of meaning. Go (2020) emphasizes that in a society shaped by digital information flows, the ability to understand and interpret social reality is an important foundation for individuals to conduct social criticism responsibly. Therefore, the achievement of more prominent reflective and creative thinking does not indicate weaknesses in students' abilities, but rather shows that students are in the phase of forming social awareness, which is a prerequisite for the development of critical thinking.

The findings of this study show that students' ability to respond to real social issues develops through reflection, exploration of ideas, and critical evaluation of information circulating. Although this study does not directly compare different learning models, the dynamics of problem-based learning that emphasizes argumentative discussion and exploration of social issues seem to provide room for the development of these stages of thinking. Therefore, Sociology learning oriented towards sociological thinking needs to provide sufficient space for meaning-making and idea development, so that students' critical thinking skills become more mature and contextual.

Variations in Sociological Thinking Patterns Between Classes in Responding to Digital Social Issues

The results of this study show that there is variation in sociological thinking patterns between classes, even though all students are in the same learning context and face the same social issues. The differences in achievement across indicators indicate that students' ability to respond to real social issues in the digital era is determined not only by exposure to learning materials but also by the dynamics of class discussions, thinking habits, and students' social experiences in interacting with digital discourse.

In some classes, the achievement of reflective and creative thinking in descriptive analysis is relatively high, reflecting a tendency to interpret social issues narratively and contextually as part of the social reflection process. They associate social issues more with personal experiences, observations on social media, and examples from daily life. This pattern is in line with findings that adolescents' social responses in the digital age are often mediated by subjective experiences and media exposure, so that the stage of meaning becomes more prominent than critical structural evaluations (Tambunan et al., 2025).

On the other hand, in a class that, in descriptive analysis, shows relatively higher levels of critical thinking, students seem more accustomed to questioning the validity of information and comparing various sources before

expressing their opinions. As one of the students explained in a previous interview session, the class discussion process encourages them to compare various arguments before taking a position on an issue (RD, XII 7).

This strengthens the argument that the development of critical thinking is strongly influenced by the practice of social discussion, which gives room for skeptical and evaluative attitudes (Ismail et al., 2023; Wayudi et al., 2020; Nur et al., 2023). In this context, the classroom serves as a space for social interaction that shapes students' thinking habits through discussion and the exchange of arguments.

This variation across classes also shows that sociological thinking does not develop in a linear, uniform manner. Some students show strong tendencies in the reflective and creative aspects, while others are more prominent in the critical aspects. This is in line with Go's view (2020) which states that sociological thinking skills are influenced by the interaction between learning structures and student agency in responding to social realities.

In the digital era, this difference in patterns becomes significant because students encounter the same flow of information but interpret it through different mindsets. Saputra & Aba Research (2025) emphasize that inequality in how digital social issues are interpreted and evaluated can affect the quality of social awareness and participation among digital citizens. Therefore, the variation in achievement between classes in this study not only shows differences in learning outcomes but also reflects the diverse ways in which students position themselves as social subjects in a digital society.

Thus, the variation in sociological thinking patterns between classes in this study confirms that Sociology learning needs to pay attention to the context of discussion, thinking habits, and social dynamics of the classroom. These findings reinforce the argument that strengthening sociological thinking is not enough through the delivery of material but requires a learning design that consciously builds spaces for dialogue, reflection, and sustainable social evaluation.

Critical Thinking as a Complex Stage in Sociological Thinking

Although theoretically, critical thinking is positioned as the most complex stage in understanding social reality (Rosidah et al., 2018; Roudlo, 2020)The results of this study show that the critical thinking indicator has the highest average score among the indicators (M = 83). These findings raise a significant contradiction between theoretical claims about the complexity of critical thinking and students' relatively high empirical achievement. However, this contradiction cannot be understood as an inconsistency of the findings, but rather indicates that the ability develops through a scaffolding process from the previous stage that gradually supports students' evaluation and argumentation abilities (Gunawardena & Wilson, 2021; Lombardi et al., 2018). This means that critical thinking is the culmination of an integrated, gradual thinking process, in which high achievements reflect the accumulation of abilities from previous stages.

The results of the quantitative analysis showed that the common issue indicator had a significant influence on critical thinking skills ($B = 0.37$, $p < 0.001$). In addition, the scatter plots of the relationship between reflective and critical thinking show a consistent pattern of positive linear associations, where an increase in reflective ability is followed by an increase in critical thinking ability. These findings suggest that critical thinking skills do not develop in isolation but result from an integrated, gradual thought process.

In this context, the high achievement on the critical thinking indicator does not indicate that this stage is easier; rather, it indicates that the ability develops through a structured process

from the previous stage. Students do not immediately conduct critical evaluations, but first through the process of identifying social issues, reflecting on various perspectives, and developing the possibility of social responses (Ruggierro, 1996). These stages provide a cognitive foundation that enables students to conduct critical evaluations more systematically. Thus, high achievement in critical indicators can be understood as the cumulative contribution of previous indicators, rather than as a stand-alone ability. This is in line with the finding that the critical thinking process involves evaluating the relationship between evidence and explanation that develops through reflective stages and gradual construction of knowledge (Lombardi et al., 2018). These complex evaluative abilities do not appear automatically, but are facilitated through scaffolding that allows students to assess various alternatives in a more structured manner. Therefore, the high achievement in the critical thinking indicators in this study reflects the results of an integrated thinking process, not a lower level of difficulty.

The interview data reinforced this interpretation by showing that students still interpreted the critical thinking stage as the phase that most demands focus, caution, and intellectual responsibility, even though their achievement was quantitatively high. In one of the interview sessions, students explained that when the discussion enters the analysis stage, they must examine various arguments more carefully and adjust their positions based on rational considerations (WD, XII 6). This shows that students understand critical thinking as an evaluative process that demands the legitimacy of arguments, not just the courage to argue. These findings are in line with Bashi (2023) and Putra et al. (2025), which emphasize that critical sociological thinking is not only concerned with skepticism but also with the ability to assess social claims in light of the relationships among knowledge, power, and the structural context. These findings show that high scores do not indicate low process complexity but rather students' success in carrying out complex cognitive processes after completing previous stages.

In the context of the digital era, this complexity is increasingly visible because students are not only exposed to social facts, but also to personal opinions, viral narratives, and information that is often unverified. This is reflected in the student's statement:

"On social media, there are many things that seem convincing, but if you check again, sometimes the source is not clear." (NK, XII 6)

This statement shows that even though students can achieve high scores on critical indicators, they remain aware of the complexity of the information evaluation process. These findings corroborate the study that the main challenge of critical thinking in a digital society lies in distinguishing between facts, opinions, and narrative construction. (Andersson, 2021; Cladis, 2020). In this situation, students are required to have adequate epistemic literacy to avoid being trapped in reproducing dominant discourse or being misled by information. Thus, high achievement does not remove difficulties; rather, it shows that students can manage these complexities through a trained thought process.

Furthermore, students also acknowledge that the demands of critical thinking often lead to cognitive fatigue and insecurity. One student stated:

"If you are tired, you have to stay focused. Sometimes I'm afraid of making a mistake too, so I prefer to keep quiet." (RZ, XII 8)

These findings confirm that subjectively students still experience critical thinking as a

difficult and challenging process. These findings are in line with Thakore (2024) which emphasizes that critical thinking in sociology requires intellectual courage and awareness of potential errors, so that not all students feel comfortable at this stage without adequate pedagogical support.

The variation in critical thinking achievement between classes in this study also showed that the development of critical thinking may be influenced by the dynamics of class discussions and students' learning habits. In classes with higher levels of critical-thinking achievement, students appear more accustomed to questioning information, comparing sources, and challenging peers' arguments. This is in accordance with research that states that critical thinking in Sociology develops through dialogical social practices, not through one-way knowledge transfer (Ardiansyah et al., 2024; Efendi & Qodr, 2023; Wulandari et al., 2024).

Overall, the findings of this study show that although the critical thinking indicator has the highest score achievement, this stage remains the most complex cognitive process. The high achievement actually emphasizes the interdependence of the process: critical thinking skills develop optimally when supported by the interconnectedness of indicators within the framework of sociological thinking. Thus, the contradiction between theoretical complexity and empirical achievement does not indicate inconsistencies in the findings but rather reflects the development of critical thinking skills through the interconnectedness of indicators within a structured learning process.

CONCLUSION

This research shows that students' ability to respond to digital social issues develops through a thinking process that involves reflection, exploration of ideas, and critical evaluation of circulating information. Quantitative results show relatively high achievement in reflective, creative, and critical thinking, with variations in development among students, while critical thinking appears to be a more challenging stage and does not develop automatically. This finding is strengthened by interview data, which reveal that students consciously begin their social response by first understanding and interpreting the issue before conducting a critical evaluation.

Reflective processes serve as an initial cognitive mechanism that helps students manage the complexity of digital information and avoid reactive responses. The creative stage provides space to explore various social perspectives without high evaluative pressure. Meanwhile, critical thinking demands epistemic readiness, intellectual courage, and more intensive evidence-based evaluation exercises. The variation in achievement between classes shows that the development of sociological thinking is also influenced by the dynamics of discussion, thinking habits, and learning context.

Theoretically, this study shows that sociological thinking among high school students can be understood not just as cognitive achievement but as a process of developing social awareness that involves reflection, exploration of ideas, and critical evaluation of digital social issues. However, this interpretation needs to be read within the limits of the research design which is descriptive-correlational and does not involve control groups or pre-intervention measurements. Therefore, these findings are not intended to infer the causal effectiveness of learning, but rather to map patterns of students' abilities in the context under study.

Pedagogically, the results of this study suggest that Sociology learning can be designed in a more structured way to provide space for reflection, exploration of ideas, and practice of critical evaluation in a sustainable manner. Nonetheless, the generalizability of these findings was limited to the school context and the participants' characteristics. Further research

using experimental or longitudinal designs is needed to examine the dynamics of the development of sociological thinking in a broader context.

DECLARATION OF GENERATIVE AI USAGE IN THE WRITING PROCESS

In preparing this manuscript, the author used ChatGPT (OpenAI) as a generative AI tool to improve sentence structure, language clarity, and the coherence of academic argumentation. After using the tool, the author conducts a thorough review and revision and is fully responsible for the article's content and substance.

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