

Investigating the Contribution of a Social Sensitivity-Integrated Problem-based Learning Model to the Development of Students' Social Sensitivity in Short Story Writing Instruction

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Abstract

The development of students' social awareness is an important aim of language teaching because it promotes empathy, perspective taking and responsible social behaviour. However, short story writing instruction often prioritizes linguistic competence while giving limited attention to students' social and emotional development. This study examined the effectiveness of the Social Sensitivity-Integrated Problem-Based Learning (SSI-PBL) model in enhancing students' social awareness through short story writing activities. A quasi-experimental design with a control group and pre-test post-test measurements was employed. The participants were 70 eighth-grade students from a public secondary school in Indonesia, divided into an experimental group ($n = 35$) and a control group ($n = 35$). Data were collected using a validated social awareness questionnaire and a short story writing assessment rubric and were analyzed using descriptive statistics and analysis of covariance (ANCOVA) to determine the effect of the intervention while controlling for baseline differences. The findings revealed that students in the experimental group demonstrated significantly higher levels of social awareness than those in the control group after the intervention ($F(1.67) = 93.49$, $p < 0.001$, partial $\eta^2 = 0.58$). Furthermore, the adjusted mean score of the experimental group was substantially higher than that of the control group (88.64 versus 77.84). The results indicate that integrating authentic social issues into problem-based short story writing activities effectively promotes social awareness, empathy, perspective-taking and social responsibility. These findings suggest that the SSI-PBL model provides a valuable pedagogical framework for integrating social development with language learning and writing instruction.

Keywords: Language Education, Problem-based Learning, Quasi-experimental Study, Short Story Writing, Social Sensitivity.

Introduction

Developing students' social skills requires distinguishing between social awareness and social sensitivity, two related but complementary abilities. Social awareness involves recognizing others' perspectives, showing empathy and interacting effectively across diverse backgrounds (1, 2). whereas social sensitivity refers to recognizing and appropriately responding to others' feelings, needs and social cues (3, 4). As social and cultural interactions become increasingly complex, students need these abilities to understand diverse perspectives, communicate respectfully and make responsible social decisions (5, 6). Consequently, social sensitivity is an important educational outcome that supports individual development and positive social participation (7). Social sensitivity helps students engage with social issues and consider different experiences and perspectives when developing their stories (8, 9). It involves interpreting social

situations, appreciating diversity, showing empathy and adapting behavior to sociocultural contexts (10, 11). It encompasses empathy, perspective taking, social awareness, prosocial behavior and responsible interpersonal interaction (12, 13). Research has shown that students with higher social sensitivity tend to develop stronger interpersonal relationships, better collaboration skills, greater empathy and more positive engagement in school activities (14, 15). Social sensitivity is also associated with psychological well-being, conflict resolution, appreciation of diversity and responsible participation in school and community life (5, 16). Importantly, it is not merely an individual attribute but can be intentionally developed through meaningful interaction and reflection, including discussing authentic social issues, considering multiple perspectives, collaborating with peers and reflecting on the consequences of actions (4, 8).

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(Received 21st July 2026; Accepted 28th September 2026; Published 24th October 2026)

Writing provides a useful context for developing social sensitivity because it is not only a language activity but also a cognitive and social process through which learners construct meaning, interpret experiences and communicate within social and cultural contexts (17, 18). It also allows students to explore personal and social experiences and develop a better understanding of human interactions (19). Therefore, writing instruction can develop language skills while also promoting empathy, critical thinking and social awareness (20).

Short story writing is particularly relevant to this purpose. Through short stories, students can explore different perspectives, express emotions and understand social situations through characters and events (20, 21). Creating narratives also encourages students to consider characters' thoughts, feelings, motivations and relationships, supporting empathy, perspective taking and moral reflection (22). These processes connect students' imagination with social experiences and provide opportunities to develop social sensitivity (8, 21). Despite this potential, short story instruction does not always explicitly address social sensitivity. Previous studies indicate that short story instruction often emphasizes narrative structure, language accuracy and creative expression, while giving less attention to social issues and human values (17, 21). Consequently, social sensitivity may remain a byproduct rather than an explicit learning outcome (20, 23). This limitation suggests the need for a learning approach that can connect literary writing with meaningful social experiences.

Problem-based learning (PBL) offers such a possibility because it engages students with authentic problems through inquiry, collaboration, reflection and knowledge construction (19, 24, 25). In PBL, students identify problems, evaluate information, consider different perspectives and develop solutions collaboratively (26, 27). These activities can help students understand others' needs and experiences while fostering empathy, social awareness, perspective taking, respectful communication, appreciation of diversity and responsible behavior (24, 26, 28, 29). PBL can therefore provide a meaningful context for students to explore real-world social issues and transform their understanding into narrative writing (30, 31).

However, PBL research also has limitations. Previous studies have mainly examined cognitive and academic outcomes, including critical thinking, problem solving, creativity, communication, achievement and engagement (26, 27). Similarly, writing research has largely focused on writing quality, language skills, creativity and writing processes, with less attention to deliberately developing empathy, perspective taking and social sensitivity through literary writing (17, 21). Thus, although PBL provides processes for collaborative inquiry and problem solving and short story writing provides opportunities for perspective taking and representing human experiences, the two have rarely been systematically integrated to explicitly develop students' social sensitivity.

This limitation highlights a research gap, as previous studies have generally examined PBL and creative writing separately, with limited attention to integrating social sensitivity into PBL for short story writing. It remains unclear whether making social sensitivity an explicit target throughout problem identification, perspective taking, collaboration, reflection and narrative construction can enhance students' social sensitivity. The novelty of this study lies in integrating social sensitivity explicitly into the PBL process for short story writing, rather than treating it as an incidental outcome. This integration connects authentic social problems with opportunities for students to practice perspective taking, empathy, reflection and socially responsive meaning-making. Therefore, this study aims to investigate whether students receiving the Social Sensitivity-Integrated Problem-Based Learning (SSI-PBL) model demonstrate greater development of social sensitivity in short story writing than those receiving traditional writing instruction.

Methodology

Location and Time of the Study

The research was conducted at SMP Labschool FIP UMJ, located at Jalan KH. Ahmad Dahlan, Cireundeu, Kecamatan Ciputat Timur, Kota Tangerang Selatan, Banten 15419, Indonesia (GPS coordinates: 6°17'54.6"S, 106°46'08.0"E; -6.2985, 106.7688889). The location of the research site is presented in Figure 1. The study was conducted during the second semester of the 2025/2026 academic year, from February to April 2026. The

school was selected because it implements the Indonesian national curriculum, in which short story writing is one of the core competencies for eighth-grade students. In addition, the school has

parallel classes with similar academic characteristics, infrastructure and learning environments, making it suitable for the implementation of a quasi-experimental research design.

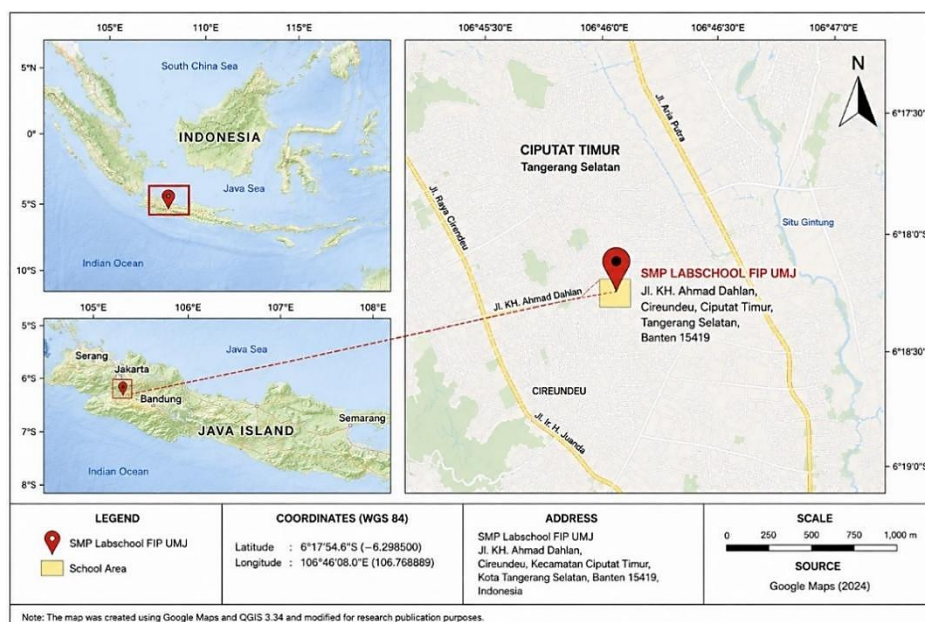


Figure 1: The Location of the Research

The study lasted for eight weeks and consisted of a pretest, six teaching sessions and a posttest. The intervention was integrated into the regular classroom schedule to examine the implementation of the Social Sensitivity-Integrated Problem-Based Learning (SSI-PBL) model in an authentic teaching and learning context. All instructional activities and assessments were conducted in Bahasa Indonesia, which was the regular language of instruction for both groups. Prior to data collection, permission was obtained from the school administration and the Indonesian language teacher. Participation was voluntary and all participants and their parents or legal guardians provided informed consent in accordance with institutional research ethics.

Research Design and Conceptual Framework

The study employed a quantitative approach using a quasi-experimental, non-equivalent control group pretest-posttest design to investigate the contribution of the SSI-PBL model to students' social sensitivity in short story writing. A quasi-experimental design was appropriate because the study was conducted in a natural classroom setting in which random assignment of individual students was not possible (32).

The conceptual framework positions SSI-PBL as the independent variable, students' social sensitivity as the primary dependent variable and short story writing as the pedagogical context in which the intervention was implemented. The model integrates the core principles of PBL with explicit social-sensitivity components throughout the learning process. The proposed mechanism begins with students' engagement with authentic social problems, followed by problem identification, information gathering, collaborative inquiry, perspective taking, reflective discussion, narrative construction and reflection. These processes are intended to provide repeated opportunities for students to recognize social issues, understand others' perspectives and experiences, demonstrate empathy, consider diversity and develop socially responsible responses through literary expression (20, 26).

Within this framework, short story writing functions not merely as the final writing task but also as a medium through which students transform their understanding of social issues and human experiences into narratives. The integration of social sensitivity into the PBL process is therefore expected to connect authentic social problems, collaborative inquiry, perspective taking, empathy, reflection and narrative

construction with the development of students' social sensitivity. The conceptual relationship and

proposed mechanism of SSI-PBL are presented in Figure 2.

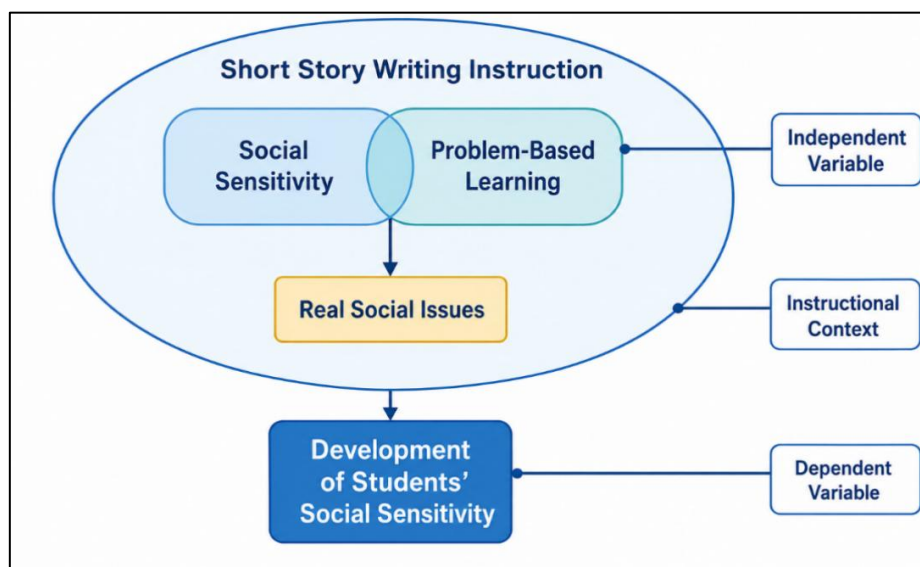


Figure 2: Conceptual Framework

Experimental Design and Sampling

The participants were eighth-grade students at SMP Labschool FIP UMJ. Purposive sampling was used because the study required parallel classes with comparable academic characteristics, the same Indonesian curriculum and the same teacher. This approach allowed the researchers to maintain the natural classroom setting required for the quasi-experimental design context (32).

A total of 70 eighth-grade students participated in the study, comprising two classes of 35 students each. One class was assigned as the experimental group and the other as the control group. The experimental group received instruction using the SSI-PBL model, whereas the control group received

conventional short story writing instruction. The two groups followed the same grade level, curriculum, instructional duration, learning objectives and assessment framework. Importantly, the same teacher instructed both groups, thereby reducing potential differences attributable to teacher characteristics. The teacher also received preparation on the implementation of the SSI-PBL procedures before the intervention. The use of the same teacher and comparable instructional conditions was intended to minimize potential teacher effects and strengthen the comparability of the two groups.

The experimental design can be summarized in Table 1.

Table 1: Experimental Design of this Research

Group	Conception
Experimental	$O_1 \rightarrow X \rightarrow O_2$
Control	$O_1 \rightarrow C \rightarrow O_2$

Note: O_1 represents the pretest, X represents the SSI-PBL intervention, C represents conventional short story writing instruction and O_2 represents the posttest.

Treatment

The intervention was implemented during six teaching sessions following the pretest. The experimental group received instruction through the SSI-PBL model, while the control group received conventional short story writing instruction based on the Indonesian national curriculum. The same teacher taught both groups, using the same learning objectives, instructional time and assessment framework. The principal

difference between the groups was the pedagogical approach as shown in Table 2.

The teacher received preparation on the SSI-PBL procedures before implementing the intervention. The preparation focused on the sequence of SSI-PBL activities and the integration of social-sensitivity components into the learning process. During the intervention, the teacher followed the predetermined SSI-PBL stages to ensure consistency across the six teaching sessions. The

control group received conventional instruction emphasizing short story concepts, narrative structure, language use and writing practice without systematically integrating social sensitivity into the instructional stages.

The SSI-PBL model combines the core principles of PBL with explicit opportunities for developing social sensitivity. Students begin by examining authentic social issues relevant to their lives. They then identify and analyze problems, collect

information, consider different perspectives, participate in collaborative discussion, reflect on social values and transform their understanding into short stories. Through these activities, students are encouraged to recognize social problems, understand others' experiences, appreciate different perspectives, demonstrate empathy and communicate socially responsible ideas through narrative writing.

Table 2: Comparison of Teaching Procedures Between Conventional Short Story Writing Instruction and SSI-PBL

Learning Phase	Conventional Teaching	Model SSI-PBL	Expected Results
Learning orientation	The teacher explained the concept and structure of short stories.	Teachers present authentic social issues through news, videos, photos, or real cases to raise awareness among students.	social awareness
Identification of problems	Students identify writing topics given by the teacher.	Students collectively identify and analyze real social problems.	Raising awareness about social issues
Information collection	Students read examples and receive explanations about narrative elements.	Students study the causes, impacts and possible solutions to social problems using a variety of information sources.	Taking perspective
Collaborative discussion	This discussion focuses on narrative structure and language use.	This discussion emphasizes diversity of viewpoints, empathy and reflection on social values.	Empathy and respect for diversity
Writing short stories	Students write short stories based on topics given by the teacher.	Students write short stories inspired by real social issues and incorporate empathy, social responsibility and moral values into their narratives.	social responsibility
Reflection and evaluation	Teachers evaluate students' writing based on the quality of language and narrative.	Students engage in self-reflection and peer reflection on the quality of their writing and the representation of social sensitivity in their stories.	reflective social action

Research Instruments

The Social Sensitivity Questionnaire was the primary instrument used to measure students' social sensitivity, while the Short Story Writing Assessment Rubric served as an auxiliary instrument for evaluating students' narrative writing. Both instruments were used within the instructional context of the study (8, 33).

The Social Sensitivity Questionnaire was adapted from established frameworks of social-emotional competence and social perspective taking that are conceptually related to social sensitivity. It was designed to assess four dimensions: social awareness, empathy, perspective taking and social responsibility. The dimensions, indicators and corresponding items of the questionnaire are

presented in Table 3. Social awareness refers to students' ability to identify social issues, recognize the needs of others and appreciate social diversity. Empathy refers to the ability to understand and respond appropriately to the feelings and experiences of others. Perspective taking refers to the ability to consider different viewpoints before making judgments or decisions. Social responsibility refers to students' willingness to act responsibly and contribute positively to addressing social problems. The questionnaire consisted of 24 items, with six items representing each dimension. Responses were recorded on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating higher levels of social sensitivity.

Table 3: Dimensions and Indicators of the Social Sensitivity Questionnaire

Dimension	Indicator
Social awareness	Recognizing social problems, understanding the needs of others, appreciating diversity.
Empathy	Understanding other people's emotions, showing empathy and being emotionally responsive.
Taking perspective	Consider different points of view, understand other people's perspectives before making judgments.
Social responsibility	Demonstrate responsibility, contribute to solving social problems and respect social values.

The Short Story Writing Assessment Rubric was used to evaluate students' writing products. Because the primary purpose of the study was to examine social sensitivity rather than writing achievement as a separate primary outcome, writing quality functioned primarily as an instructional assessment and supporting measure within the short story writing context. The rubric assessed story structure, social themes and messages, storyline development, characterization, setting, language use, creativity and originality and integration of social sensitivity. The assessment aspects and corresponding indicators are presented in Table 4. The rubric combined established principles of narrative writing assessment with the instructional objectives of SSI-PBL (34).

The rubric employed an analytic rating approach based on the principles of independent criterion scoring, allowing each aspect of writing performance to be assessed separately (35), where each criterion can be scored independently to provide objective and consistent scoring. Since the main aim of this study was to investigate students' social sensitivity, an additional assessment criterion was added, called Integration of Social Sensitivity. This criterion was developed from previous studies illustrating the role of narrative writing in promoting empathy, perspective taking and social responsibility through literary expression (36, 37). Each criterion was scored on a four-point analytic scale, with higher scores indicating stronger performance.

Table 4: Short Story Writing Assessment Rubric

Evaluation aspects	Indicator
Narrative structure	This short story presents a complete and coherent narrative structure, including introduction, complication, climax, resolution and ending.
Social themes and messages	This story presents a clear theme and effectively conveys social values, empathy, or moral messages that are relevant in dealing with real social problems.
Storyline development	The storyline develops logically and coherently and supports the development of the story from beginning to end.
Characterization	The characters are well-developed, consistent and show convincing emotions, motivations and interactions.
Arrangement	The space-time setting and atmosphere are clearly depicted and contribute to the development of the story.
Language use	This story demonstrates effective grammar, vocabulary, sentence structure and language use, appropriate for narrative writing.
Creativity and originality	This story demonstrates originality, creativity and imaginative development of ideas.
Integration of social sensitivity	This story illustrates students' ability to identify social problems, show empathy, consider multiple points of view and present responsible solutions through literary narrative.

Table 5: Content Validity of the Research Instruments

Instrument	Number of items/criteria	Aiken's V	Interpretation
Social Sensitivity Questionnaire	24	0.83–1.00	Very high
Short story writing evaluation table	8	0.86–1.00	Very high

Validity and Reliability

Prior to data collection, both research instruments were evaluated to establish their content validity and reliability. Content validity was assessed through expert judgment involving three specia-

lists in language education, educational psychology and educational assessment. Each questionnaire item and rubric criterion was evaluated using a five-point rating scale covering relevance, clarity and representativeness. The degree of agreement

among the experts was calculated using Aiken's V coefficient (38, 39).

The results of the content validity analysis are presented in Table 5. The Social Sensitivity Questionnaire obtained Aiken's V values ranging from 0.83 to 1.00, while the Short Story Writing Assessment Rubric obtained values ranging from 0.86 to 1.00. These results indicate high content validity for both instruments.

The reliability of the Social Sensitivity Questionnaire was assessed using Cronbach's

alpha, while the reliability of the Short Story Writing Assessment Rubric was assessed using the Intraclass Correlation Coefficient (ICC) based on independent ratings by two assessors. The Social Sensitivity Questionnaire obtained a Cronbach's alpha coefficient of 0.92, indicating excellent internal consistency. The Short Story Writing Assessment Rubric obtained an overall ICC of 0.88, indicating excellent inter-rater reliability. The reliability results for both instruments are presented in Table 6.

Table 6: Reliability of the Research Instruments

Instrument	Reliability test	Coefficient	Interpretation
Social Sensitivity Questionnaire	Alfa Cronbach	0.92	Very good
Short story writing evaluation table	Intraclass correlation coefficient (ICC)	0.88	Very good

Data Analysis

Following the validation and reliability assessment of the research instruments, the effectiveness of the SSI-PBL model was examined using Analysis of Covariance (ANCOVA). Descriptive statistics were first calculated to summarize students' pretest and posttest social sensitivity scores. Before conducting the ANCOVA, the assumptions of normality, homogeneity of variance and homogeneity of regression slopes were examined. The pretest social sensitivity score was used as the covariate, while the posttest social sensitivity score was treated as the dependent variable. Group membership represented the independent variable.

ANCOVA was selected because it enabled the researchers to compare posttest social sensitivity between the experimental and control groups while statistically controlling for students' initial social sensitivity. Statistical analyses were performed using IBM SPSS Statistics. The statistical significance level was set at $p < 0.05$.

Results

Descriptive Statistics

Table 7 shows the descriptive statistics of the students' social sensitivity scores in the experimental and control groups before and after the educational intervention. The experimental group's mean pretest score before intervention was 68.71 and the control group's was 69.34, showing that the two groups were equivalent in social sensitivity at the beginning of the study. The social sensitivity scores of both groups increased after the educational intervention was applied. However, the increase was much more in the experimental group whose mean rose to 88.91 as compared to 77.57 of the control group. The descriptive statistics suggest that the experimental group increased in social sensitivity scores more than the control group. However, additional inferential analysis was conducted to assess whether the observed differences were statistically significant.

Table 7: Descriptive Statistics of Students' Social Sensitivity Scores

Group	Test	N	Mean	SD	Minimum	Maximum
Experimental	Pretest	35	68.71	5.64	57	80
Experimental	Post-test	35	88.91	5.58	78	100
Control	Pretest	35	69.34	5.24	58	80
Control	Post-test	35	77.57	5.36	66	90

Note: N = number of participants, SD = Standard Deviation.

Hypothesis Testing

Test for Normal Distribution

Table 8 shows the results of the Shapiro-Wilk normality test to determine the distribution of social sensitivity scores of students in the

experimental and control groups. As shown in the table, all p values were higher than the significance level of 0.05, indicating that the pretest and posttest scores were normally distributed. The assumption of normality needed for additional parametric analyses was therefore satisfied.

Table 8: Results of the Shapiro-Wilk Normality Test

Group	Test	W	p	Interpretation
Experimental	Pretest	0.976	0.621	Normal
Experimental	Post-test	0.981	0.774	Normal
Control	Pretest	0.971	0.438	Normal
Control	Post-test	0.978	0.683	Normal

Note: W = Shapiro-Wilk test statistic, p = significance level.

Homogeneity of Variance and Homogeneity of Regression Slope

Table 9 presents the results of the assumption tests for ANCOVA, including the homogeneity of variance and homogeneity of regression slopes.

Homogeneity of variance was examined using Levene's test for both the pretest and posttest scores, whereas homogeneity of regression slopes was assessed by testing the interaction between the group and pretest scores.

Table 9: Hypothesis Test Results for ANCOVA

Assumption	Test	Statistic	p	Interpretation
Homogeneity of Variance (Pretest)	Levene's Test	0.53	0.469	Homogeneous
Homogeneity of Variance (Posttest)	Levene's Test	0.45	0.507	Homogeneous
Homogeneity of Regression Slopes	Group × Pretest	0.02	0.892	The hypothesis was confirmed.

Note: p = significance level.

Effect of Problem Based Learning with Social Intelligence Orientation (SSI-PBL) on Students Social Sensitivity

An analysis of covariance (ANCOVA) was conducted to determine the effect of the social sensitivity integrated problem-based learning (SSI-PBL) model on the students' social sensitivity, with the initial social sensitivity scores of the students as a covariate. Pre-test scores were used as a covariate to control for the influence of initial differences between the experimental and control groups.

As Table 10 shows, the covariate (pretest) had a significant effect on students' posttest social sensitivity scores, $F(1.67) = 18.46$, $p < 0.001$, indicating that students' social sensitivity before the intervention was related to their scores after the intervention. Importantly, after controlling for pretest differences, the intervention group had a

statistically significant effect on students' social sensitivity, $F(1.67) = 93.49$, $p < 0.001$. The partial eta-square obtained ($\eta^2 = 0.58$) indicated a large effect size, meaning that about 58% of the variance in students' posttest social sensitivity scores was due to the implementation of the SSI-PBL model after controlling for the covariate.

These results demonstrated that students who participated in the SSI-PBL model gained significantly higher level of social sensitivity than students who had conventional instruction.

To facilitate understanding of the results of ANCOVA, estimated marginal means (adjusted means) were computed, controlling for students' pretest social sensitivity scores. These adjusted means are the posttest scores of the experimental and control groups, statistically controlling for differences in social sensitivity at baseline. Table 10 shows the results.

Table 10: ANCOVA Results

Source	Df	F	p	Partial η^2
Pretest	1	18.46	< 0.001	0.22
Group	1	93.49	< 0.001	0.58
Error	67	-	-	-

Note: Df = degrees of freedom, F = F-statistic, p = significance level, Partial η^2 = partial eta squared.

Table 11 shows the estimated marginal mean scores confirmed the effectiveness of the SSI-PBL model. After adjusting for students' pre-test scores, the experimental group had a higher adjusted mean score ($M = 88.64$) than the control group ($M = 77.84$). The results indicated that the advantage

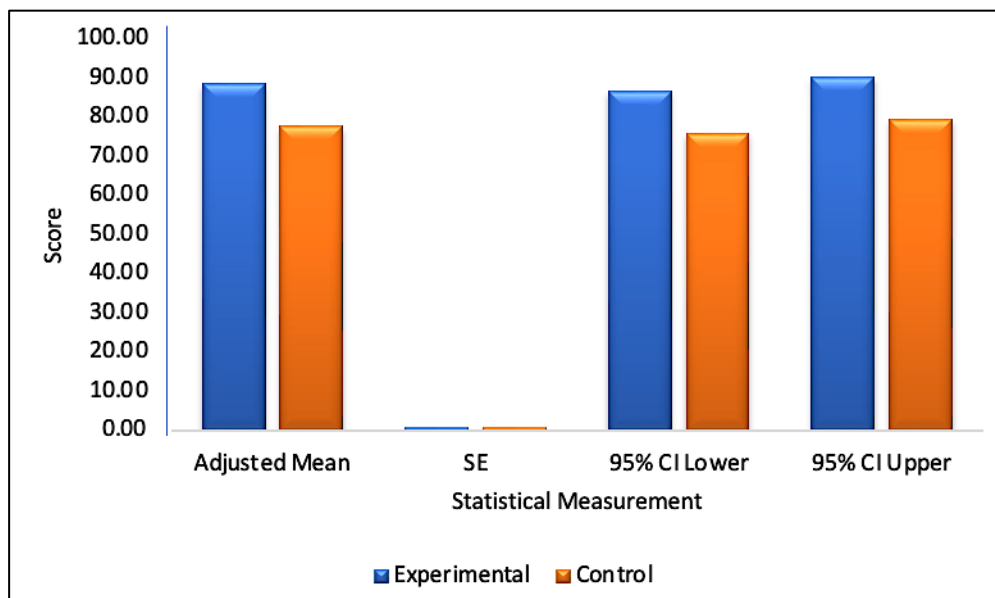
of the experimental group still existed after controlling for the differences of students' initial levels of social sensitivity, which confirmed that the SSI-PBL model was more effective than the traditional teaching in developing students' social sensitivity.

Table 11: Average Adjusted Social Sensitivity Scores of Students

Group	Adjusted Average	Standard Error	95% Confidence Interval
Experimental	88.64	0.91	86.84 – 90.44
Control	77.84	0.91	76.04 – 79.64

To facilitate a clearer visual comparison between the two groups, the adjusted mean scores obtained from the ANCOVA analysis are illustrated in Figure 3. This figure illustrates the adjusted mean scores

obtained with ANCOVA. As shown in Table 11, the experimental group obtained higher adjusted mean scores than the control group after accounting for baseline differences.

**Figure 3:** Adjusted Mean of Score of Students' Social Sensitivity

Discussion

The findings of this study indicate that students who received the Social Sensitivity-Integrated Problem-Based Learning (SSI-PBL) model demonstrated significantly higher social sensitivity than students who received traditional writing instruction. This finding suggests that integrating social sensitivity into problem-based learning can provide a learning experience that extends beyond conventional cognitive and writing-oriented outcomes. Through SSI-PBL, students were engaged in authentic social problems, encouraged to examine multiple viewpoints, discuss possible responses and express their understanding through short story writing. These activities may have provided opportunities for students to recognize social realities, understand others' emotions and experiences and reflect on their responsibilities toward others. This interpretation is consistent with the constructivist view that meaningful learning develops when students actively construct knowledge through authentic experiences and social interaction, supporting both cognitive and socio-emotional development

(20, 26). It is also consistent with research indicating that problem-based learning is particularly meaningful when authentic problems serve as the basis for inquiry and reflection, enabling students to connect academic learning with real-world social contexts and develop higher-order social skills (8,40).

A key feature of the SSI-PBL model that may explain this difference is its use of authentic social issues as the starting point for learning. Unlike traditional writing instruction, which may rely on hypothetical or context-limited topics, SSI-PBL engages students with social issues that are relevant to their everyday experiences. Confronting such issues encourages students to examine social phenomena critically, recognize the needs and difficulties experienced by others and consider multiple perspectives before formulating possible responses. These processes provide opportunities for students to practice perspective taking and empathy while developing their understanding of social situations. This interpretation is consistent with previous studies showing that authentic problem contexts can deepen

students' social understanding, strengthen interpersonal awareness and connect academic learning with concrete experiences (8, 20, 40). Thus, the distinctive contribution of SSI-PBL is not merely the use of problem-based learning, but the deliberate use of socially meaningful problems as a mechanism through which students engage in perspective taking, reflection and socially responsive meaning-making.

Another factor contributing to the effectiveness of SSI-PBL is the use of short story writing as a means of reflection and social expression. Writing short stories requires students to transform their understanding of real-world social issues into coherent narratives by constructing characters, conflicts, settings and resolutions that represent the human experience. Through this process, students are encouraged to consider the thoughts, emotions, motivations and perspectives of various characters, thereby fostering empathy and the ability to view matters from others' points of view. Rather than merely describing social phenomena, students interpret social reality, contemplate social or moral dilemmas and represent various possible responses through narrative. This reflective process helps students connect their understanding of social issues to the human experience, making the social significance of these issues personally meaningful. Previous studies have also shown that literary representation through story writing enables students to explore the human experience, deepen emotional engagement and develop a more profound understanding of social relationships (17, 21). Thus, within the SSI-PBL framework, short story writing serves not only as a language learning activity but also as a reflective tool that allows students to process social issues and cultivate social sensitivity.

The findings of this study extend previous research on problem-based learning (PBL) by suggesting that its pedagogical potential may extend beyond cognitive and academic outcomes to the development of social sensitivity. Previous studies have consistently shown that PBL can enhance critical thinking, collaboration, communication and active engagement through authentic problem-solving activities (26, 40). However, previous applications of PBL have paid comparatively less attention to the deliberate development of social-emotional capacities within writing instruction. The present study addresses

this gap by embedding authentic social issues and social-sensitivity-oriented activities within a short story writing process. In this approach, social sensitivity is positioned as an explicit learning outcome, rather than being treated as an incidental benefit of PBL. The contribution of SSI-PBL therefore lies in aligning problem-based inquiry with opportunities for empathy, perspective taking, social awareness and social responsibility through literary expression. In this respect, SSI-PBL extends the application of PBL in language teaching by connecting problem inquiry, social reflection and narrative expression within a single instructional process.

The findings also have important implications for language teaching, particularly for short story writing instruction. Rather than limiting writing activities to linguistic accuracy, text organization and creative expression, teachers can use socially meaningful issues to create opportunities for students to examine social realities, consider diverse perspectives and reflect on human experiences through narrative. Within the SSI-PBL framework, short story writing provides a context in which students can transform their engagement with authentic social problems into literary representations that involve characters, conflicts, emotions and possible social responses. This approach may therefore support the integration of literacy instruction with social-emotional learning by providing structured opportunities for students to practice empathy, perspective taking, social awareness and social responsibility. Importantly, the findings do not suggest that writing quality itself was the primary outcome of the intervention; rather, short story writing functioned as the pedagogical context and expressive medium through which social sensitivity was developed. Accordingly, SSI-PBL offers a practical framework for teachers seeking to incorporate social-emotional objectives into language instruction while maintaining short story writing as the central learning activity.

Several limitations should be considered when interpreting the findings of this study. First, the study was conducted at a single school with a relatively small sample, which may limit the transferability of the findings to other educational settings and student populations. Second, the use of intact classes in a quasi-experimental design means that students were not randomly assigned

to the experimental and control groups; therefore, potential selection bias cannot be completely excluded. Third, although the same teacher taught both groups and the instructional objectives, time allocation and assessment procedures were kept consistent, the possibility of instructor-related effects cannot be entirely ruled out. Fourth, social sensitivity was measured primarily through a self-report questionnaire, which may be subject to response or measurement bias. Finally, the intervention was implemented over a relatively short period, so the study could not determine whether the observed differences in social sensitivity would be sustained over time. These limitations suggest that the findings should be interpreted as evidence of a significant adjusted group difference associated with SSI-PBL rather than as definitive evidence of a causal effect across broader educational contexts.

Future research should examine the SSI-PBL model across multiple schools, educational levels and cultural contexts using larger and more diverse samples to strengthen the generalizability of the findings. Where feasible, randomized or stronger quasi-experimental designs could also be employed to reduce potential selection bias and provide stronger evidence regarding the contribution of SSI-PBL to students' social sensitivity. Longitudinal research is needed to determine whether changes in social sensitivity are sustained beyond the intervention period. Future studies could also involve multiple teachers and examine potential instructor effects, while combining self-report measures with observational or performance-based measures to reduce potential measurement bias. In addition, research could investigate other outcomes, such as creativity, ethical reasoning, communication skills and civic engagement, to further examine the educational potential of SSI-PBL. The integration of digital technology or artificial intelligence could also be explored to support collaborative inquiry, reflective writing and feedback processes within the SSI-PBL framework.

Conclusion

The findings indicate that students who participated in SSI-PBL demonstrated higher adjusted social sensitivity than those who received traditional short story writing instruction. The contribution of SSI-PBL lies in explicitly integrating

social sensitivity into problem-based learning through authentic social issues, collaborative inquiry, perspective taking, reflection and narrative expression. Rather than treating social sensitivity as an incidental outcome of PBL or literary writing, the model positions it as an explicit learning objective within the instructional process. These findings extend the pedagogical application of PBL in language education and suggest that short story writing can serve as a meaningful context for engaging students with social experiences and developing social sensitivity. Within the limitations of the present study, SSI-PBL therefore represents a promising pedagogical framework for integrating literacy instruction with social-emotional learning and socially responsive education.

Abbreviations

ANCOVA: Analysis of Covariance, Df: degrees of freedom, F: F-statistic, ICC: Intraclass Correlation Coefficient, N: number of participants, p: significance level, PBL: Problem-Based Learning, Partial η^2 : partial eta squared, SD: Standard Deviation, SSI-PBL: Social Sensitivity-Integrated Problem-Based Learning, W: test statistic.

Acknowledgement

The authors would like to express their sincere gratitude to the participating school, teachers and students for their valuable cooperation throughout this study. The authors also acknowledge the experts who participated in the validation of the research instruments and all individuals who contributed to the successful implementation of the research.

Author Contributions

Lutfi: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Visualization, Writing Original Draft Preparation, Manuscript Preparation, Aceng Rahmat: Supervision, Conceptualization, Methodology, Validation, Writing - Review and Editing, Critical Revision of the Manuscript for Important Intellectual Content, Ratna Dewanti: Supervision, Validation, Writing - Review and Editing, Critical Revision of the Manuscript for Important Intellectual Content. All authors have read and approved the final version of the manuscript.

Conflict of Interest

The authors declare that they have no conflict of interest.

Data Availability

The data supporting the findings of this study are not publicly available because they contain information subject to participant confidentiality. Data may be made available by the corresponding author upon reasonable request, subject to applicable ethical and confidentiality requirements.

Declaration of Artificial Intelligence (AI) Assistance

The authors declare that artificial intelligence (AI) tools were used solely to improve language quality, grammar and readability during the preparation of this manuscript and to assist in the preparation of the figures. The figures were developed by the authors using their own research data and content, with AI tools used only as an assistance in the figure preparation process. The graphs were independently created by the authors. No AI tools were used to generate, alter, or fabricate the research data, statistical results, or findings. All research ideas, study design, data collection, data analysis, interpretation of the findings and conclusions were developed, verified and approved entirely by the authors, who assume full responsibility for the originality, accuracy, interpretation and integrity of the manuscript.

Ethics Approval

This study was conducted in accordance with the ethical principles governing educational research. Participation was voluntary and informed consent was obtained from all participants prior to data collection. The confidentiality and anonymity of the participants were maintained throughout the research process.

Funding

This research received no external funding.

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How to Cite: Lutfi, Rahmat A, Dewanti R. Investigating the Contribution of a Social Sensitivity-integrated Problem-based Learning Model to the Development of Students' Social Sensitivity in Short Story Writing Instruction. *Int Res J Multidiscip Scope.* 2026;7(4):1617-1630. DOI: 10.47857/irjms.2026.v07i04.013510