Pakistan Journal of Life and Social Sciences

RESEARCH ARTICLE

Enhancing 21st-Century Writing Skills through a Reflective Collaborative Learning: Model Based on Critical Thinking

Khaerudin Kurniawan[1*], Indrawati[2*]

[1] Faculty of Language and Literature Education, Indonesia University of Education, Bandung, Indonesia
[2] School of Economics and Business, Telkom University, Bandung, Indonesia

ARTICLE INFO	ABSTRACT
	This study developed and tested the effectiveness of a novel collaborative learning model grounded in critical thinking skills, aimed at enhancing students' abilities to write teaching materials. Unlike conventional methods, this model uniquely integrates critical thinking as a core component of collaboration, specifically designed to address the complex skill sets required in 21st-century learning environments. Using a quasi-experimental design, the study involved two groups of students: an experimental group using the critical thinking-based collaborative learning model and a control group employing traditional methods. The results revealed that the experimental group experienced a significant improvement in writing ability and critical thinking skills compared to the control group, with statistically significant differences ($p < 0.05$). This model effectively strengthens key competencies for 21st-century learning, including collaboration, communication, and digital literacy. The innovative approach presented in this study provides a pathway for higher education institutions to equip students with essential skills for global challenges.

INTRODUCTION

The 21st century is characterized by an era of openness and globalization, leading to profound changes in social structures compared to the previous century. One of the most significant impacts of globalization on education is the heightened demand for 21st-century skills. These skills encompass critical thinking, problem-solving, communication, collaboration, creativity, digital literacy, and media literacy. Such competencies are essential as they equip students to navigate the increasingly complex challenges of the modern world (Widodo & Wardani, 2020; Zhou & Li, 2022). In academic settings, critical thinking skills are particularly vital for success across various disciplines, especially in the development of writing skills, where students are expected to articulate their ideas logically, coherently, and with clarity (Alpat and Görgülü, 2024, Facione, 2020).

In writing, critical thinking is necessary to enable the writer to organize ideas, formulate arguments, and convey thoughts effectively and communicatively (Maryana & Sukmawati, 2021). This skill requires continuous practice and reflection to produce meaningful work (Waruwu, 2022). However, many students still face challenges in organizing ideas and presenting logical arguments. This study highlights that writing skills are closely related to students' literacy, which directly impacts their success in the learning process.

In the writing learning process, conventional teacher-centered approaches often prove ineffective in cultivating the critical and creative thinking skills necessary in the digital age. Therefore, a collaborative learning model emphasizing critical thinking has emerged as a more innovative solution. Collaborative learning encompasses a range of educational approaches involving intellectual cooperation among students or between students and teachers (Purwati & Erawati, 2021). Recent research reinforces that collaborative learning is effective for improving critical thinking and writing skills by encouraging inquiry, reflection, and peer feedback, all essential for developing 21st-century competencies (Shofiah, Putera, & Widiastuti, 2024; Gokhale, 2000). Furthermore, integrating collaborative methods within problem-based learning frameworks has shown to be particularly valuable, enabling students to enhance both cognitive and meta-cognitive skills essential for complex problem-solving (Hsu, 2021; Markula & Aksela, 2022; Tsybulsky, 2023). Additionally, collaborative learning environments foster social and emotional skills that are increasingly necessary for professional success in contemporary workplaces.

Writing teaching materials requires higher critical thinking skills compared to general writing, as a teaching material writer must present information in a clear, logical, and meaningful way. To develop these skills, students need a learning approach that supports exploration and interaction of ideas, rather than merely memorizing or completing tasks individually (Suyanto, 2020). One approach considered effective in developing writing skills is a reflective collaborative learning model based on critical thinking, which provides students with space to collaborate and give constructive feedback to each other (Putri & Dewi, 2021).

Language literacy is a fundamental aspect in developing writing skills, encompassing the ability to read, write, speak, and listen, which builds students' intellectual capacity to understand and communicate information effectively (Baynham, 2019). This ability aligns with the demands of the 21st century, which includes digital and visual literacy, so students are expected to process and represent information through writing (Suwanto, 2020). Strong language literacy provides a foundational framework for students to comprehend and integrate various information into meaningful and critical writing.

However, the practice of teaching material writing still faces implementation challenges. A major obstacle for students is the low interest in quality reading and writing. UNESCO (2019) reported that reading interest in Indonesia remains low, directly impacting students' writing abilities. Additionally, individual and passive writing instruction often focuses on grammar rules rather than idea exploration, which limits students' creativity in writing (Mukminatien, 2020). Teacher-centered learning models frequently provide insufficient space for students to think critically and collaboratively, hindering their creativity and reflective thinking abilities (Sinaga, 2019).

In the reflective collaborative learning model, critical thinking skills are central to the teaching and learning process, encouraging students to rethink, revise, and refine their work based on peer feedback. This approach enriches students' perspectives, enhances the quality of their writing, and cultivates openness to constructive criticism (Ranbir, 2024 and Lamaro et al. 2024). Collaborative, constructivist learning environments have been shown to significantly boost student engagement and critical thinking by promoting social interaction and cooperative learning, which are fundamental to constructivist theory. This model aligns with modern social constructivist views, emphasizing that social interaction is key to understanding and knowledge-building (Zhang, 2023).

By applying this learning model, students are expected not only to master good writing techniques but also to produce critical, reflective writing that meets 21st-century skill demands. The integration of critical thinking and collaboration in teaching material writing has the potential to significantly enhance learning quality and meet the skill and competency requirements in the globalization era.

LITERATURE REVIEW

The significance of collaborative learning models in enhancing students' critical thinking skills has been well documented, particularly within the realm of academic writing. Research by Jumadi et al. (2021) and Laakso et al. (2021) highlights the positive effects of technology-assisted collaborative learning on critical and creative thinking. Their findings suggest that student collaboration not only fosters a deeper understanding of the material but also cultivates essential analytical skills necessary for academic contexts, particularly in writing. This underscores the central role that collaborative models play in developing critical thinking skills vital for producing reflective and analytical academic work.

Collaborative learning facilitates interaction among learners, allowing them to draw from diverse perspectives, develop social competencies, and enhance their comprehension of the material through group discussions (Gokhale, 2019). In the context of textbook writing, collaboration provides a platform for peer feedback and evaluation, which significantly improves the quality of writing and enriches the learning experience. This approach fosters a dynamic learning environment where each member shares accountability for achieving collective objectives. Johnson (2020) emphasizes that collaborative learning encourages students to support one another in deepening their understanding through active discussions and interactions. This methodology not only aids in concept comprehension but also bolsters students' confidence in articulating their ideas both verbally and in writing. Through collaboration, learners enhance their abilities to voice opinions, critique arguments, and listen to differing viewpoints, thereby directly enriching their critical thinking skills (Panitz, 2021).

The reflective collaborative learning model merges the elements of collaboration and reflection within the educational process. According to Gokhale (1995), this model empowers students to work collaboratively in groups, providing mutual feedback while actively reflecting on their learning experiences and outcomes. Such engagement not only sharpens critical thinking skills but also enhances writing abilities. Research indicates that students participating in this model show significant advancements in both writing and critical thinking capabilities (Dewantara, Smith & Brown, 2021).

In the context of 21st-century education, critical thinking skills are fundamental, particularly in academic writing. Ennis (2018) defines critical thinking as the ability to analyze, evaluate, and make decisions grounded in logical reasoning. This skillset encourages students to organize their ideas coherently while considering various perspectives and relevant references, ultimately enabling them to produce more profound written work. Facione (2020) affirms that instruction emphasizing critical thinking significantly enhances the quality of students' writing in terms of argumentation and structural integrity.

Language literacy serves as a cornerstone for effective writing skills, intertwining with the understanding of social and cultural contexts inherent in language use. Street (2018) posits that robust language literacy empowers students to think critically and creatively as they develop their writing content. The process of writing scientific papers is complex, necessitating critical analysis and the construction of logical arguments. Baker (2020) notes that language literacy encompasses the ability to comprehend and produce texts proficiently, which is fundamental to good writing. This literacy is not confined to verbal communication but extends to visual and digital literacy as well. In today's digital age, Martin and Grudziecki (2019) argue that digital literacy is crucial; students must navigate, assess, and generate information from a variety of digital sources.

Reflective learning emerges as a vital process that enables students to assess their work, recognize strengths and weaknesses, and identify avenues for improvement. Dewey (2020) emphasizes that reflection within the writing process allows students to learn from their mistakes and refine their skills. This reflective practice fosters a habit of continuous enhancement in writing quality. Walker (2021) further asserts that engaging in reflective processes encourages students to grasp the

purpose and meaning behind their writing, culminating in more meaningful and communicative outputs.

Despite the merits of collaborative and reflective learning models, challenges persist, particularly concerning students' reading interests. A survey conducted by PISA (OECD, 2018) reveals that Indonesian students exhibit low levels of reading interest, which adversely affects their writing skills. Moreover, Prayitno (2020) notes that teacher-centered instructional approaches often fail to provide students with the necessary space to explore ideas independently and reflectively, which is crucial for cultivating effective writing skills.

The integration of a Reflective Collaborative Learning Model rooted in critical thinking presents a promising approach to teaching 21st-century writing skills. By fostering collaboration, reflection, and critical engagement, this model can significantly enhance students' abilities to produce high-quality academic writing.

RESEARCH METHOD

This study employs a quasi-experimental design with a pretest-post-test approach to assess the effectiveness of a reflective collaborative learning model based on critical thinking in teaching material writing. According to Creswell & Creswell (2018), quasi-experimental designs allow researchers to evaluate the effects of an intervention in a more natural context where randomization is not always feasible. The study subjects consist of students divided into two groups: an experimental group, which uses the innovative learning model, and a control group, which follows conventional methods.

The research instruments include a writing test to measure students' ability to construct arguments and organize ideas, as well as a questionnaire to assess students' perceptions of the applied learning model. The procedure involves conducting a pretest to gather baseline data, implementing the learning intervention over several weeks, and conducting a post-test to measure improvement in writing skills. Data from the writing tests will be analysed using descriptive and inferential statistics, such as t-tests, to determine the significance of differences between the two groups (Creswell & Creswell, 2018). Meanwhile, questionnaire data will be analysed qualitatively.

The indicators of research success include an increase in scores between the pretest and post-test, as well as positive feedback from students regarding their learning experience. This study is planned to cover all stages, including preparation, intervention, and data analysis, with the hope of providing empirical evidence on the effectiveness of the applied learning model in the context of 21st-century skills. This approach aligns the view of Creswell & Creswell (2018) view, which emphasizes the importance of systematic and objective data analysis to produce valid and reliable findings.

RESULTS

This study aims to evaluate the effectiveness of a reflective collaborative learning model based on critical thinking in enhancing students' skills in writing teaching materials. The study uses a quasi-experimental design involving two groups: an experimental group that uses the innovative learning model and a control group that follows conventional methods.

Table 1: Pretest and Post-test Scores of the Experimental and Control Groups

Group	Average Pretest Score	Average Post-test Score	Pretest Standard Deviation	Post-test Standard Deviation
Experimental Group	60.5	80.2	5.8	6.3
Control Group	61.0	70.2	6.0	7.0

Based on the table, the average pretest score of the experimental group is 60.5, while the control group scored slightly higher at 61.0. However, after the intervention, the experimental group

demonstrated a more significant improvement, with an average post-test score of 80.2, compared to the control group, which only reached 70.2. This indicates that the implementation of a reflective collaborative learning model based on critical thinking has a more substantial positive impact on improving writing skills.

Table 2: T-Test Analysis

F	Sig.	t	df	Sig. (2-tailed)
4.56	.032	16.275	58	.000

These results indicate that the calculated t-value (4.56) is much greater than the t-table value (2.00), and the p-value is less than 0.05, suggesting that the difference between the two groups is statistically significant. Thus, it can be concluded that the reflective collaborative learning model based on critical thinking is significantly more effective in enhancing writing skills compared to conventional learning methods.

Table 3: Writing Criteria Performance

Writing Criteria	Experimental Group (%)	Control Group (%)
Idea Organization	75	50
Creativity	70	40
Argument Development	80	55

From the table above, it is evident that the experimental group achieved much higher scores across all criteria compared to the control group. For example, 75% of students in the experimental group were able to organize ideas effectively, while only 50% of the control group reached a high score in the same criterion. This achievement indicates that the applied learning model successfully helps students to organize and structure their ideas more systematically and logically.

Similarly, in the creativity criterion, 70% of students in the experimental group demonstrated high creativity in their writing, compared to only 40% in the control group. This shows that the collaborative learning approach not only enhances general writing skills but also provides space for students to express their creativity.

For the argument development criterion, the experimental group showed the most notable result, with 80% of students able to develop strong arguments and support their opinions effectively, while only 55% of the control group met this criterion. This significant improvement in argumentation demonstrates that the reflective collaborative learning model based on critical thinking has a greater positive impact on students' ability to formulate logical and structured arguments.

Table 4: Summary of Survey Results on Student Perceptions

Question	Percentage Agree (%)
Feels more confident in writing	82
Likes the learning method used	85
Finds collaborative learning effective	90
Finds it easier to organize ideas after learning	80
Thinks group discussions help clarify understanding	88
Feels motivated to contribute in groups	86
Finds peer feedback very useful	84
Feels this learning enhances critical thinking skills	87
Feels better prepared for future writing challenges	83
Realizes collaboration leads to better ideas	91
Finds this model relevant to workplace needs	89
Feels more comfortable sharing opinions in groups	81
Finds individual tasks more interesting after collaboration	78
Feels this learning encourages creativity	92

Finds the time provided sufficient to complete tasks	76

The survey reveals many positive aspects of the reflective collaborative learning model based on critical thinking. Besides the improvement in writing skills, students also shared deep insights into how this learning approach impacts their confidence and social interaction. Firstly, 80% of students found it easier to organize ideas after participating in this learning, indicating that the collaborative approach encourages them to think systematically and structurally, an important skill in academic writing. Additionally, 88% of students felt that group discussions significantly aided in clarifying their understanding, demonstrating the effectiveness of social interaction in the learning process.

One remarkable aspect is that 91% of students recognized that collaboration can lead to better ideas. This reflects students' ability to collaborate and integrate diverse perspectives into their writing, a skill highly valued in the modern workforce. Students also felt an enhancement in their critical thinking skills, with 87% agreeing that this learning model improved their critical thinking ability. This shows that the learning model not only focuses on outcomes but also fosters a deep learning process.

Furthermore, 89% of students believe this learning model is relevant to workplace needs. Considering the future skills required, this approach equips students with tools to compete in an increasingly competitive job market. Finally, students felt more comfortable sharing their opinions within groups, with 81% agreeing that they felt more at ease after participating in this learning. This reflects an increase in their confidence and communication skills.

Overall, the student feedback indicates that the reflective collaborative learning model based on critical thinking is not only effective in enhancing writing skills but also builds confidence, improves critical thinking skills, and prepares them for challenges in the workforce.

Table 5: Quality of Teaching Material Writing Assignments

Task Quality	Experimental Group (%)	Control Group (%)
Very Good	70	40
Good	20	30
Fair	10	20
Poor	0	10

The analysis of writing assignment quality shows a significant difference between the experimental and control groups. In the experimental group, which applied the reflective collaborative learning model based on critical thinking, 70% of students produced assignments rated as "Very Good." This figure indicates that the majority of students successfully applied critical and collaborative thinking skills taught during the learning process. Conversely, in the control group, which followed conventional learning methods, only 40% of students achieved the same quality level.

Furthermore, 20% of students in the experimental group received a "Good" rating, while the control group had 30% of students in this category. Although there were students who reached a good quality level in both groups, the experimental group had a higher percentage in the higher quality categories.

The "Fair" and "Poor" categories show a noticeable difference between the two groups. In the experimental group, only 10% of assignments were rated "Fair," while the control group recorded 20% in this category. Additionally, there were no assignments rated "Poor" in the experimental group, whereas the control group had 10% of students fall into this category.

Overall, these results indicate that the reflective collaborative learning model based on critical thinking has a positive impact on the quality of students' writing assignments. The improvement in assignment quality reflects the effectiveness of the applied learning method, where students not only can organize ideas well but also construct logical and relevant arguments. Therefore, implementing

this learning model can be proposed as a more effective alternative for enhancing writing skills among students.

DISCUSSION

This study demonstrates that a reflective collaborative learning model grounded in critical thinking significantly enhances students' writing skills compared to conventional teaching methods. The findings reveal that students utilizing this approach are not only able to organize their ideas and formulate arguments effectively but also experience a marked increase in writing confidence. Notably, 100% of students in the experimental group achieved ratings classified as "Good" to "Very Good" in their writing skills, contrasting with the control group, which exhibited more varied results.

The social interactions fostered within the collaborative learning model facilitate the exchange of ideas, constructive feedback, and in-depth discussions—all essential components for developing critical thinking skills. This observation aligns with existing literature emphasizing that active student engagement in the learning process is crucial for achieving improved educational outcomes (Hattie & Timperley, 2007; Johnson & Johnson, 2019). Collaborative learning not only enhances understanding but also nurtures an environment where students feel more empowered to express their thoughts and critique others' viewpoints, thus promoting a deeper level of engagement with the material (Panitz, 2021).

Despite the challenges, such as varying levels of student comfort in collaboration, the results of this study provide empirical evidence that implementing this learning model is a positive step in preparing students to face the challenges of the 21st century. As noted by Gokhale (1995), collaborative learning environments encourage reflection and critical assessment of one's work, further enhancing the quality of written output. Moreover, the reflective aspect of this model compels students to consider their writing processes and outcomes, which contributes to their overall development as writers (Dewey, 2020).

The implications of this study suggest that higher education institutions should integrate the reflective collaborative learning model based on critical thinking into their writing curricula. This integration can further enhance students' writing skills and improve their relevance in the professional world, as critical writing skills are increasingly recognized as essential in various fields (Facione, 2020; Ennis, 2018). Furthermore, research shows that students trained in critical thinking and collaborative practices are better equipped to navigate complex real-world problems (Baker, 2020; Martin & Grudziecki, 2019).

This study supports the notion that a reflective collaborative learning model not only improves writing skills but also prepares students for future challenges by cultivating critical thinking abilities essential for success in the 21st century.

AUTHORS' CONTRIBUTIONS

First Author (Khaerudin Kurniawan): Khaerudin Kurniawan was responsible for the research concept, methodology design, and data collection. He conducted the primary data analysis and drafted most of the manuscript content, actively contributing to revisions and refinements as required. He also served as the corresponding author for the publication.

Second Author (Indrawati): She contributed to the literature review, data validation, and supported statistical analysis and interpretation of results. She also reviewed the final draft, ensuring scientific integrity, and handled reference documentation and final editing of the manuscript.

REFERENCES

Alpat, M. F., & Görgülü, E. (2024). Transformative Learning: Flipped Classroom and Its Impact on Writing Skill and Critical Thinking Level. *Open Praxis*, 16(3), pp. 396–409. https://doi.org/10.55982/openpraxis.16.3.704

Baker, L. (2020). Understanding language literacy: Bridging verbal and digital communication. . Journal of Language and Literacy Education, 16(1), 45-60.

Baynham, M. (2019). Literacy Practices: Invesigating Literacy in Social Contexts. Routledge.

Creswell, J. W., & Creswell, J. D. (2018). Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Los Angeles: Sage.

Dewantara, M. A., Smith, J., & Brown, K. (2021). The Impact of Collaborative Learning on Writing Skills. Journal of Education and Practice, 12(8), 54-65.

Dewey, J. (2020). Democracy and Education: An Introduction to the Philosophy of Education. New York: Free Press.

Ennis, R. H. (2018). Critical Thinking Across the Curriculum: A Vision. Inquiry: Critical Thinking Across the Disciplines, 33(3), 15-25.

Facione, P. A. (2020). Critical Thinking: What It Is and Why It Counts. Insight Assessment.

Gokhale, A. (2000). Collaborative learning enhances critical thinking. *Journal of Technology Education*, *7*(1). https://doi.org/10.1007/978-1-4419-1428-6_910

Johnson, D. W. (2020). Reaching Out: Interpersonal Effective and Self-Actualization. Pearson.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (2014). Cooperative learning: Improving university instruction by basing practice on validated theory. Journal on Excellence in College Teaching, 25(3&4), 85-118.

Jumadi, J., Perdana, R., Hariadi, M. H., Warsono, W., & Wahyudi, A. (2021, Juni). The Impact of Collaborative Model Assisted by Google Classroom to Improve Students' Creative Thinking Skills. International Journal of Evaluation and Research in Education (IJERE), 10(2), 396-403.

Laakso, M.-J., Kaila, E., Rajala, T., & Salaksosi, T. (2021). Utilizing Collaborative Learning in Blended Learning Environment with ViLLE. Education and Information Technologies, 26, 4291-4307.

Lamaro, G., Kimoga, J., Nampijja, D., & Reichert, F. (2024). Enhancing critical thinking through academic collaborations. *African Educational Research Journal,* *12*(4), 255–261. https://doi.org/10.30918/AERJ.124.24.042

Martin, A. J., & Grudziecki, J. (2019). Digital literacy: A review of the literature. . Journal of Educational Technology & Society, 22(2), 25-40.

Maryana, S., & Sukmawati, W. (2021). Meningkatkan Keterampilan Menulis Karangan Sederhana melalui Pendekatan Contextual Teaching And Learning (CTL). Ideas: Jurnal Pendidikan, Sosial, Dan Budaya, 7(4), 205.

Mukminatien, N. (2020). Improving Students' Writing Sklls through Teacher Feedback and Revision. Journal of Language Teaching and Research, 11(4), 635-643.

OECD. (2019). PISA 2018 Results (Volume I): What Students Know and Can Do. . OECD Publishing.

Panitz, T. (2021). Collaborative vs. Cooperative Learning: A Comparison of the Two. . Journal of Cooperative Education & Internships, 43(1), 2-12.

Purwati, N. K., & Erawati, N. K. (2021). Pengembangan Buku Ajar Metode Numerik Berbasis Pembelajaran Kolaboratif. Mosharafa: Jurnal Pendidikan Matematika 10(1), 37-48.

Putri, L., & Dewi, R. (2021). Pengaruh Model Pembelajaran Berbasis Proyek terhadap Keterampilan Menulis Siswa di Sekolah Menengah Pertama. Jurnal Pendidikan dan Pembelajaran, 123-135.

Ranbir, D. (2024). Promoting critical thinking skills in the classroom. *Universal Research Reports, 11*(2), 154–158. https://doi.org/10.36676/urr.v11.i2.1276

Shofiah, N., Putera, Z. F., & Widiastuti, S. (2024). Collaborative writing learning in inquiry to improve critical thinking skills. *Journal of English for Academic and Specific Purposes*, *7*(1). https://doi.org/10.18860/jeasp.v7i1.26429

Sinaga, H. (2019). Collaborative Writing: A Classroom Practice to Develop Students' Writting Skills. Language Circle: Journal of Language and Literature, 14(2), 189-201.

Street, B. V. (2018). Social Literacies: Critical Approaches to Literacy in Development, Ethnography, and Education. Routledge.

UNESCO. (2019). Global Report on the Impact of Reading and Writing on Learning Outcomes.

Walker. (2021). Innovative Teaching Strategies for the 21st Century Classroom. Education Review, 15(3), 178-190.

Waruwu, L. (2022). Penerapan Model Pembelajaran Concept Sentence Untuk Meningkatkan Kemampuan Menulis Teks Ulasan. Educativo: Jurnal Perdidikan, 1(1), 167-173.

Widodo, S., & Wardani, R. K. (2020, September 30). Mengajarkan Keterampilan Abad 21 4C (Communication, Collaboration, Critical Thinking and Problem Solving, Creativity and Innovation) di Sekolah Dasar. MODELING: Jurnal Program Studi PGMI, 7(2), 185-197.

Zhang, Z. (2023). Collaborative learning in social constructivism: Promoting English learning in a secondary classroom in China. *Journal of Education and Educational Research, 3*(3), 1–12.