

Integrating Miro into The Picture Word Inductive Model (PWIM) to Enhance Collaborative Writing in EFL Instruction

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Abstract

This study explores the integration of Miro, a digital visual collaboration platform, into the Picture Word Inductive Model (PWIM) to enhance collaborative writing among eighth-grade students in an English as a Foreign Language (EFL) context. Employing a qualitative case study design, data were collected through classroom observations, student interviews, and document analysis of student writing. The integration of Miro addressed key challenges in vocabulary development and idea organization, while also fostering student engagement, peer interaction, and structured language production. Students reported increased motivation, reduced writing anxiety, and greater confidence in expressing their ideas. Miro's visual tools supported brainstorming, sequencing, and revision activities, enabling learners to develop not only their linguistic abilities but also critical thinking and digital communication skills. The findings highlight the pedagogical value of combining inductive teaching models with interactive digital platforms to support student-centered, collaborative learning in EFL instruction.

Keywords: Miro; Picture Word Inductive Model; Collaborative Writing; EFL; Digital Literacy

INTRODUCTION

Writing is widely recognized as one of the most essential yet challenging skills in English as a Foreign Language (EFL) instruction. It allows learners to express ideas, convey information, and participate in both academic and social communication. However, many EFL students encounter significant difficulties due to the cognitive demands and linguistic complexity of writing. Effective written communication requires learners to engage in multiple stages, including generating ideas, organizing them logically, choosing precise vocabulary, and applying correct grammar (Hedge, 2000). According to Hakimah (2024), writing development is a gradual and recursive process that demands consistent practice, self-reflection, and revision in order to internalize language structures and build learner confidence. In the Indonesian EFL context, students often struggle with limited vocabulary, persistent grammatical errors, and difficulties in creating coherent texts (Indriastuti, 2019). These challenges are frequently exacerbated by traditional instructional approaches that emphasize grammatical accuracy and mechanical drills over student creativity and critical thinking (Gillett et al., 2009). Moreover, writing tasks generally lack the immediacy of feedback present in speaking activities, which may lead to increased anxiety and decreased motivation (Hyland, 2003). In response, many scholars and educators advocate for more student-centered and process-based writing approaches, which highlight the importance of drafting, peer collaboration, and learner autonomy (Sabat & Slamet, 2019). One effective pedagogical model that aligns with such learner-centered approaches is the Picture Word Inductive Model (PWIM), introduced by Calhoun (1999). PWIM is a visual-based strategy that helps learners observe, label, and categorize vocabulary from pictures, which then serves as a scaffold for constructing sentences and paragraphs. This inductive method allows students to build connections between visual cues and language output, thereby strengthening vocabulary development, idea generation, and

writing fluency (Meliasari et al., 2018; Mutmainna & Usman, 2025). Research confirms that PWIM is versatile and effective across various learning contexts, consistently contributing to improved student writing outcomes and motivation (Sari & Santika, 2020; Ilahi & Prayogo, 2022; Lubis et al., 2024). However, prior studies on PWIM have primarily focused on its use in traditional classroom settings and have not explored its potential when combined with digital tools to support collaborative writing. Alongside pedagogical models like PWIM, the integration of digital tools has significantly transformed language learning, providing learners with more engaging, collaborative, and interactive experiences. Miro, a cloud-based visual collaboration platform, offers features such as digital sticky notes, diagrams, and mind maps, which support both real-time and asynchronous brainstorming and idea organization (Van Laar et al., 2020; Ashraf et al., 2021). Its functionality promotes key 21st-century skills such as critical thinking, communication, and collaboration, making it an ideal tool for enhancing writing instruction (Skubik-Peplaski et al., 2022). Furthermore, Miro's integration with other productivity tools and its visual interface help streamline collaborative writing processes in both face-to-face and virtual learning environments (Oktaputriviant, 2022). Recent studies have shown the positive effects of digital collaboration tools on students' motivation, engagement, and writing performance. Song & Song (2023) found that the use of digital platforms fosters active participation and learner autonomy in writing tasks. Similarly, Zou et al. (2025) emphasized that collaborative technologies support differentiated instruction and inclusive learning environments. These findings are supported by Mai (2020), who argues that digital literacy is becoming just as important as linguistic ability in EFL classrooms. While these studies highlight the benefits of digital platforms in writing instruction, they tend to treat the tools as stand-alone strategies and do not examine how they can be purposefully integrated into established instructional models.

Although PWIM and Miro have independently shown positive outcomes in enhancing vocabulary development and fostering collaborative writing respectively, their combined use remains unexplored. This represents a clear research gap in the current literature. No empirical study to date has investigated how the integration of the inductive visual scaffolding provided by PWIM with the real-time digital collaboration features of Miro could support the development of collaborative writing skills in EFL settings. Exploring this integration offers a novel instructional approach that may not only enhance students' vocabulary and idea organization but also promote active engagement, peer interaction, and digital competency. Therefore, this study aims to explore how the integration of Miro into the Picture Word Inductive Model (PWIM) enhances collaborative writing among eighth-grade EFL students in Jakarta. Specifically, it investigates how this integration supports vocabulary acquisition, idea organization, and digital collaboration in a technology-enhanced classroom setting.

METHOD

This study employed a qualitative case study approach to explore how the integration of Miro and the Picture Word Inductive Model (PWIM) supports collaborative writing among eighth-grade EFL students in Jakarta. This method was chosen for its ability to provide rich, contextual insights into classroom learning processes (Creswell & Creswell, 2022; Ary et al., 2009). The research took place in Class 8A of a junior high school that incorporates digital and visual tools in its English instruction. The class consisted of 32 purposively selected students with prior experience in collaborative learning and familiarity with Miro. To capture varied perspectives, five students were interviewed based on differences in English proficiency, group roles, and digital literacy levels.

Data were collected through classroom observations, semi-structured interviews, and document analysis. Observations recorded real-time interactions during writing activities, while interviews explored student perceptions and experiences using Miro and PWIM. Document analysis (Bowen, 2009) was used to examine students' written work and digital artifacts, focusing on vocabulary use, idea organization, and collaboration. The data analysis followed Miles and Huberman's (1992) interactive model: data reduction through coding, data display through thematic organization, and conclusion drawing through interpretation and verification. To enhance validity and reliability, peer discussions and participant confirmations were conducted. This methodological framework allowed for a comprehensive understanding of how Miro and PWIM facilitated student engagement, collaboration, and writing development in the EFL classroom.

RESULTS AND DISCUSSION

Results

A. Enabling Students to Extract New Vocabulary

The integration of the Picture Word Inductive Model (PWIM) and Miro significantly enhanced students' ability to discover and organize new vocabulary in a contextual and collaborative way. PWIM guided students to observe thematic images and identify relevant words, while Miro supported the digital arrangement of vocabulary through tools like sticky notes, color coding, and labeling.

This combination not only helped students collect object-based nouns but also expanded their awareness of descriptive and situational vocabulary. The visual scaffolding from PWIM encouraged natural word generation, while Miro's features enabled students to group, revise, and label vocabulary effectively. Many students developed strategies such as categorizing words by color and organizing tasks through peer role division.

One student explained their process in detail:

“We wrote all the words we saw in the picture, grouped them, and then turned them into sentences.” (S3)

These practices reflect how vocabulary learning evolved into a more interactive and reflective process. Students were actively engaged in constructing collaborative vocabulary banks, which served as strong foundations for their writing tasks.

B. Facilitating Students in Organizing Ideas for Structured Language Production

Helping students organize their ideas is essential for producing coherent writing. In this study, the integration of PWIM and Miro effectively facilitated this process. PWIM offered a structured inductive approach starting from image observation, while Miro provided a flexible digital space where students could visually map, group, and connect ideas collaboratively. Students used Miro's mind-mapping and sticky note features to expand key themes such as shopping or zoo visits into organized categories of nouns, adjectives, and actions. This helped them move beyond simple word listing to logical idea grouping. One student described their approach:

“I made a big sticky note in the middle that said ‘Shopping Activity,’ then I connected it to other words like ‘woman,’ ‘bag,’ ‘store,’ ‘crowd.’” (S3)

Additionally, students utilized Miro's frame feature to sequence their work from vocabulary collection to sentence construction and paragraph development, making the writing process

more manageable. They also divided roles among group members, allowing each student to focus on specific components and contribute meaningfully.

Through the combined use of PWIM and Miro, students developed a stronger ability to organize their ideas systematically before writing, making the process more collaborative, structured, and student-centered.

C. Enhancing Peer Interaction in Collaborative Writing

The integration of PWIM and Miro significantly enhanced peer interaction during collaborative writing. Students moved from working individually to engaging in active discussions, exchanging ideas, and collaboratively refining vocabulary and sentence construction. Miro's features such as sticky notes, shared boards, and comment boxes enabled real-time contributions, encouraging equal participation.

During writing activities, students critically discussed word choices and sentence clarity. One student suggested describing the beach scene with the phrase:

“Let's describe the beach as ‘soft golden sand and dancing waves.’” (S2)

This sparked further ideas and vocabulary adjustments among group members, showing how collaboration strengthened language expression.

Miro also supported students who were less confident speaking aloud. Through the comment feature, they could write their thoughts before sharing them verbally. As one student explained:

“Yes Miss, I even became more enthusiastic. Usually, I'm afraid to speak directly. But because I can write first, I can think first and arrange my words.” (S3)

In addition to idea development, students worked together to review grammar and sentence structure. They often corrected errors as a group, showing shared responsibility and increased language awareness. This approach fostered inclusive and reflective collaboration, where all students felt valued and actively contributed to the writing process.

D. Utilizing Miro as a Supportive Digital Platform for Collaborative Writing

Miro proved to be a highly supportive digital platform that enhanced students' engagement throughout the collaborative writing process. Its intuitive features, such as sticky notes, mind mapping, and real-time collaboration, encouraged students to participate actively in brainstorming, organizing, and revising ideas. When integrated with the Picture Word Inductive Model (PWIM), Miro allowed students to upload images directly to the board, keeping the visual stimulus central to vocabulary generation. Color coding helped distinguish word types, making it easier for students to structure their ideas and transform them into meaningful text.

Students also demonstrated increased autonomy and teamwork by dividing writing tasks, correcting grammar collaboratively, and giving feedback through comment features. This supported more inclusive participation, especially among quieter students. One student reflected on the ease of contributing ideas visually:

“Just click, type, and you can stick it anywhere. I even color-coded them, so my friends know which ones I wrote and can connect their ideas to mine.” (S1)

Through Miro, students not only enhanced their writing outcomes but also developed confidence, collaboration, and critical thinking in a technology-enhanced learning environment.

E. Recognizing PWIM and Miro as Significant Sources of Student Motivation

The integration of the Picture Word Inductive Model (PWIM) and Miro significantly enhanced students' motivation in collaborative writing activities. Writing, often seen as a

rigid and solitary task, became more dynamic, interactive, and enjoyable. The visual and flexible features of Miro, combined with the structured scaffolding of PWIM, allowed students to participate actively in brainstorming, organizing, and revising. They felt a greater sense of ownership as they watched their contributions grow into complete, coherent texts. The process was not only engaging but also empowering, especially for students who usually struggled with confidence or participation.

One of the key motivational factors was the safe and inclusive space created by Miro's digital features. Students who were typically shy felt more comfortable sharing ideas through writing before discussing them. As one student shared:

“I'm usually shy about speaking. But with sticky notes, I could just write my idea. My friends could still see it and we could discuss it together.” (S3)

This approach encouraged thoughtful contributions, supported peer collaboration, and helped students see writing as a shared creative journey rather than an isolated task. Through this experience, students developed stronger language skills along with a more positive and confident attitude toward learning.

F. Highlighting the Pedagogical Benefits of Integrating PWIM and Miro

The integration of the Picture Word Inductive Model (PWIM) and the Miro digital platform in writing instruction offered not only linguistic support but also a range of pedagogical benefits that supported student development in broader, meaningful ways. These tools encouraged students to become more autonomous, collaborative, and reflective learners, while simultaneously nurturing essential 21st-century skills such as digital literacy, idea organization, creativity, and peer learning. As students engaged with the tools, they encountered authentic challenges that prompted self-directed learning and strengthened their ability to work collaboratively.

One of the early challenges students faced involved managing the abundance of ideas generated during the brainstorming stage. While Miro provided a spacious and flexible environment for ideation, some students initially struggled to filter and prioritize relevant content. This sometimes resulted in disorganized boards and overlapping concepts. One student explained:

“We brainstormed quickly, but sometimes got confused about which ideas to use.” (S3)

In response to this, students independently began using Miro's frame feature to separate different stages of the writing process. They created specific areas for vocabulary, sentence construction, and paragraph drafting. This strategy not only clarified the flow of their work but also improved their visual organization and focus. A student shared:

“We organized using separate frames, one for vocabulary, one for final sentences. So they didn't get mixed up.” (S1)

This demonstrated an increased awareness of digital spatial management and marked an important step toward independent digital learning. Students were not only using tools provided to them but also adapting those tools strategically to meet their own learning needs.

Technical challenges also surfaced in the early stages, particularly among students who were unfamiliar with Miro's features. However, these difficulties became opportunities for peer learning. Rather than relying solely on the teacher, students helped one another navigate the platform, showing patience and leadership in guiding their peers. One student noted:

“If someone was confused, I showed them how to use it. We helped each other so they could also be active.” (S4)

Another student added:

“I often helped my friend who was still confused. I said, ‘Click here, then just write your idea.’ Then they got excited right away.” (S5)

These moments of peer support revealed the emergence of a collaborative culture where students not only worked together on content but also contributed to one another's confidence and digital competence. Such experiences nurtured interpersonal growth, including empathy, responsibility, and communication skills.

In some cases, students initially found it challenging to respond to visual prompts through writing. While images served as entry points for vocabulary and idea generation, a few learners struggled to translate what they saw into coherent thoughts. Once again, peer encouragement proved crucial in helping them overcome creative hesitation. One student shared:

“I often got stuck. I saw the picture, but didn't know what to write. But my friends helped, so I started to get ideas.” (S3)

Although the teacher continued to guide the process and provide structured feedback, much of the classroom dynamic evolved into a student-led environment. Students became more responsible for solving problems, generating content, and supporting each other's development. This shift toward learner agency represented a key pedagogical success of the PWIM–Miro integration.

The combined use of PWIM and Miro thus aligned well with student-centered instructional principles. It not only improved students' writing outcomes but also empowered them as independent learners, effective collaborators, and critical thinkers. Through this approach, students gained a richer learning experience that prepared them for both academic and real-world challenges.

G. Developing Collaborative Writing Skills

In developing collaborative writing skills, students engaged in a structured and student-centered process by combining the Picture Word Inductive Model (PWIM) with the interactive features of Miro. This integration supported learners through sequential stages: observing images, generating vocabulary, forming sentences, and constructing paragraphs. Miro's visual tools allowed them to organize content clearly, assign roles, and track group progress. Features like color-coded sticky notes and labeled frames helped categorize word types and maintain writing structure. These elements promoted teamwork, accountability, and a shared sense of purpose in completing writing tasks.

Communication and interaction played a central role throughout. Students discussed word choices, revised content together, and enriched their writing with descriptive and figurative

language. Everyone was encouraged to speak up or contribute in writing, helping even quieter students to participate actively. As one student reminded their peers:

“Let’s make sure everyone says something. That makes it fun.” (S1)

Through this process, students became more confident, collaborative, and reflective. The synergy between PWIM’s structured scaffolding and Miro’s interactive design effectively nurtured both writing competence and essential interpersonal skills.

Discussion

The findings of this study reveal that integrating Miro into the Picture Word Inductive Model (PWIM) significantly enriched students’ collaborative writing experiences by addressing not only linguistic development but also broader pedagogical aspects such as motivation, creativity, digital literacy, and metacognitive engagement. This integration supports the notion that combining traditional inductive models with modern digital platforms can foster more holistic and meaningful learning outcomes in English as a Foreign Language (EFL) instruction. One notable contribution of this integration lies in the enhancement of students’ vocabulary mastery. Learners moved beyond simple word recognition and began to generate expressive, contextually relevant, and even figurative language. This development aligns with Paivio’s Dual Coding Theory (1990), which underscores the importance of integrating visual and verbal inputs in cognitive processing. Furthermore, students’ ability to classify vocabulary based on grammatical functions and thematic relevance is consistent with Bartlett’s Schema Theory (1932), which suggests that learners draw on structured mental frameworks to interpret and produce language. These results expand the insights of previous PWIM-based studies (Meliasari et al., 2018; Mutmainna & Usman, 2025) by illustrating how digital tools like Miro can deepen vocabulary engagement and organization. Another prominent finding is the role of peer interaction, made possible through Miro’s collaborative features. Students provided real-time input, revised each other’s ideas, and co-constructed meaning within a shared digital space. This reflects Vygotsky’s sociocultural theory, particularly the Zone of Proximal Development, where learners benefit from scaffolded support through social interaction. While earlier studies (Song & Song, 2023) have recognized the potential of digital collaboration tools, this study contributes more nuanced, classroom-based evidence of how Miro specifically facilitates collaborative writing when combined with PWIM.

Student motivation also increased noticeably throughout the writing process. Unlike studies that primarily assess motivation through final products (Hakimah, 2024), this research captured students’ motivational behaviors and emotional involvement in real time. The freedom to choose and categorize words, the immediate visual feedback from peers, and the shared sense of purpose fostered a more engaging and student-driven learning environment. These observations are in line with the principles of Self-Determination Theory (Deci & Ryan, 1985), which highlight autonomy, competence, and relatedness as essential drivers of motivation. Compared to Kabil & Ilyas (2023), who examined Miro primarily as a collaborative workspace, this study reveals its specific motivational value in enhancing EFL writing experiences.

The integration of Miro also fostered creativity and digital literacy. Students explored figurative expressions, structured ideas visually through mind mapping, and collaborated in managing content on a shared platform. These practices resonate with Dillenbourg’s collaborative learning framework, which emphasizes co-construction, shared cognitive effort, and creative problem-solving in digital environments. Additionally, students supported one another in navigating technical features of the platform, indicating that linguistic and digital skills developed simultaneously through mutual assistance. Metacognitive awareness was another

important dimension observed in the study. Students actively monitored their progress, set group goals, and engaged in self and peer evaluation. The visibility of stages in Miro, such as labeled writing frames, supported students' ability to track revisions, identify weaknesses, and improve collaboratively. This reflects the final dimension of the Collaborative Writing Competence Framework (CWCF), which highlights self-regulation and reflection as essential competencies in group writing tasks. Notably, this metacognitive domain has been underrepresented in prior PWIM-related research and is thus a key contribution of this study. In conclusion, the integration of PWIM and Miro in EFL writing instruction has been shown to enhance not only vocabulary acquisition and idea organization but also promote learner agency, meaningful peer collaboration, and reflective learning practices. The synergy between inductive visual instruction and digital tools presents a powerful model for fostering inclusive, student-centered, and developmentally appropriate writing experiences. This study offers valuable pedagogical insights for educators seeking to design writing instruction that meets the demands of both language learning and 21st-century skill development.

CONCLUSION

This study confirms that integrating the Picture Word Inductive Model (PWIM) with the Miro digital platform effectively addresses key challenges in EFL writing instruction, particularly in vocabulary development, idea organization, and collaborative engagement. The combination of visual scaffolding from PWIM and the interactive features of Miro enabled students to generate and categorize vocabulary meaningfully, structure their ideas clearly, and participate actively in peer collaboration. Students demonstrated improved motivation, reduced writing anxiety, and greater ownership of their learning process. Through real-time interaction and visual organization, they were able to construct coherent texts while also developing essential skills such as digital literacy and reflective thinking. Overall, the integration of PWIM and Miro offers a student-centered, pedagogically grounded approach that enhances collaborative writing and supports more engaging and inclusive language learning experiences.

ACKNOWLEDGMENTS

The author sincerely thanks their beloved family for endless support, and extends deep appreciation to Dr. Sumarta, S.S., M.Pd., and Indah Purnama Dewi, S.Pd., M.Pd., for their guidance and encouragement throughout this research.

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