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Effectiveness of guided writing models based on Gen-AI and digital novels on creative writing and creative thinking skills

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ABSTRACT

The purpose of this study was to determine the effectiveness of guided writing strategies based on Gen-AI and digital novels on creative writing and creative thinking skills. The research method used in this study was a quasi-experiment involving 250 students. The instruments used were the Torrance Creative Thinking Test, Creative Writing Scale, and interviews. The data analysis employed the t-test to explore differences in the levels of creative thinking and creativity in short story composition. The results showed that guided writing strategies based on Gen-AI and digital novels could improve creative writing and creative thinking skills. Increased flexibility was observed in the use of language variations and adjustments to short story topics. Increased originality was evident in students' thinking, which was difficult to predict and capable of producing creative and innovative short stories. Increased elaboration was marked by their ability to express ideas using more complex and varied language. Furthermore, increased sensitivity was observed in students' ability to adapt short stories to more comprehensive themes. Thus, guided writing strategies based on Gen-AI and digital novels were effective in enhancing creative thinking and creative writing skills for short stories. This study implies that integrating guided writing, both individually and in groups, not only improves creative writing skills for short stories but also increases motivation to write and think creatively.

Contribution/Originality: This study contributes to the design of guided writing and the use of GenAI and digital novels to improve writing and creative thinking. The originality of this study lies in the design of guided writing, integrated with GenAI technology and digital novels, which enhances writing and creative thinking.

1. INTRODUCTION

The capacity for creative thinking and writing is essential for students to compete on a global scale in the workplace. These abilities are also crucial in education since writing allows students to convey their thoughts and serves as a form of communication. Writing skills are considered a method for educators to evaluate students' creative thinking abilities (Ivcevic & Grandinetti, 2024; Tarp, Rikke, Juhl, & and Nielsen, 2020). This creativity is not limited to just talented students; it can also be developed in all students through proper conditioning and the use of suitable scaffolding techniques. In certain nations, the government has taken an interest in student creativity by launching a national program aimed at fostering creativity development for all students without restrictions. Recognizing the significance of creative thinking abilities, the existing international student evaluation program has established a framework to evaluate students' creative thinking skills (Boyd, 2025; Gilbert & Macleroy, 2021). This evaluation aims to measure students' creative abilities across all areas of writing, including visual expression,

addressing social issues, solving scientific challenges, and tackling non-scientific dilemmas (Punzi, 2021; Xu, Manjari, Gilbert, Gang, & and Wijekumar, 2019). This framework views writing and vocal expression as the cornerstones of developing one's capacity for original thought.

Creative thinking and creative writing abilities are two skills that are crucial and enhance each other. This occurs as students who engage in more frequent writing activities possess superior creative thinking abilities (Crabtree et al., 2025; Schleser & and Kerrigan, 2024). Oral communication practices and expressions in compositions showcase students' creative thinking. Fostering imagination is a key objective in the process of learning to write literary pieces. Employing suitable strategies or methods can inspire students in the teaching of creative writing for literature (Gidiotis & Hrastinski, 2024; Wilson, 2020). This research aims to explore creative writing techniques rooted in scaffolding theory during the educational process. Most students encounter challenges when it comes to writing, particularly in creative writing. Students face difficulties such as producing unique, inventive concepts and enhancing their writing skills. Earlier research has indicated that students struggle to generate ideas and elaborate on them in the context of original writing. Moreover, additional research has revealed that creative writing instruction often imposes external criteria and restrictions that hinder students from freely expressing themselves in their writing (Jansen, 2024; Newsome, 2024).

According to the results of earlier research, literature instruction remains inadequate in enhancing students' creative writing and thinking abilities, making it essential to rejuvenate writing courses. Structuring and creative elements work well together to improve students' positive attitudes toward writing and their capacity for creative thought. Creating short story literary pieces is a practical and efficient way to enhance students' abilities in creative writing and imaginative thinking (Johnson, 2020; Ma & and Hample, 2018). The evolution of writing theory includes three phases: the social interaction model, the stage model, and the cognitive process model. The social interaction model is shaped by scaffolding and construction theories, which emphasize the interaction process among teachers, students, and various supports in the writing process (Dixon & Cox, 2025; Martin, Mirja, & and Tynjälä, 2021). Thus, according to this model, the structure for guided short story creative writing consists of three phases: individual, group, and individual writing, which can also be referred to as individual and collaborative guided writing approaches. Additionally, another tool that can assist in creative writing is Gen-AI technology, which serves as a resource for creative writing education (Haubrock et al., 2024; Zhukova, von Sperl, Matt, & Gipp, 2024).

This individual and collaborative guided writing strategy is based on scaffolding in the learning process and individual autonomy or responsibility. The current study contributes to theories, methods, and practices that significantly enhance creative writing skills. It aims to develop a framework for improving creative writing and thinking skills through writing instruction. Additionally, the study seeks to foster students' creativity without limitations in specific groups. It includes qualitative data to demonstrate how short story writing stimulates students' creative thinking. The study also investigates the contribution of the developed framework to the learning practice guide for developing students' creativity. Several previous studies have shown that creative writing skills can be improved through literary writing training (Sanabria-Z, Alfaro-Ponce, González-Pérez, & Ramírez-Montoya, 2024; Saritepeci & Yildiz Durak, 2024; Stranden & Ommundsen, 2025). Previous studies have also revealed that creative writing can be improved with collaborative and individual learning methods by optimizing idea brainstorming sessions (Brosseuk, 2024; Wang, 2024). In addition, creative writing skills can also be improved through various literary reading strategies (Kawamura & Okazawa, 2023). This study differs from previous research because it aims to develop a framework that incorporates individual and collaborative guided writing strategies in creative writing. Additionally, this study integrates guided writing strategies with Gen-AI technology and digital novels as media. Based on this explanation, the researcher formulates several problems as follows.

a) How is the impact of guided writing strategies based on Gen-AI and digital novels on creative writing and creative thinking skills in the short stories they create?

b) How is the framework for guided writing strategies based on Gen-AI and digital novels in the creative writing of literary works?

c) How do students respond to the results of developing guided writing strategies based on Gen-AI and digital novels in creative writing?

2. LITERATURE REVIEW

2.1. Development of Creative Thinking Skills Through Learning to Write Literary Works

Writing skills encompass intricate cognitive capabilities that progress through four recursive phases: brainstorming, planning, composing, and revising. The progression through these stages involves not only language proficiency levels but also incorporates advanced thinking skills, including problem-solving, critical analysis, and student creativity (McLean, Chiavaroli, Denniston, & Richardson, 2022; Wang, 2024). Various elements can enhance the quality of short stories, such as introducing fresh concepts, structuring thoughts effectively, employing elaborate and varied vocabulary, and stimulating the readers' imagination (Behrens, Marbach-Ad, & Kocher, 2024). The act of creating and structuring concepts demonstrates personal creativity. Writing in different styles is a creative method that students can utilize to share their imagination with others. Divergent thinking skills are used to generate new ideas during the writing process, and convergent thinking is used to find appropriate ideas and develop them in creative writing (Cheung, Pun, Kenneth-Li, & Mai, 2025; Synnes, Romm, & Bondevik, 2021). Teaching creativity and teaching writing share similarities by emphasizing scaffolding and active involvement to generate creative writing. The blend of language, personal experience, textual elements, and the writer's imagination can generate inventive short stories (Ballerini, Dominici, Ferracane, Menchetti, & Noirjean, 2025; Weidmann, 2024). Instructing on short story creation is an effective method for developing language skills, self-discipline, and creative thinking. Writing is an educational activity that should engage students' interest and creativity, as it offers them a chance to convey their thoughts. Nonetheless, most students show a lower interest in writing instruction. This is supported by earlier research indicating that writing prompts created by teachers primarily enhance writing quality rather than boost student motivation (Barandiaran & Pérez-Verdugo, 2025; Ten Peze, Janssen, Rijlaarsdam, & van Weijen, 2024).

This occurs due to specific criteria or standards in writing necessary for achieving a high score. Furthermore, writing problems are frequently identified, hindering students from conveying their creative thoughts. Students' ability to think creatively is limited in such a classroom environment, and their enthusiasm for writing is reduced (Chappell & Hetherington, 2024; Paz-Baruch, Grovas, & Mevarech, 2025). Furthermore, the time commitment required from teachers poses a challenge for them in fostering creative writing. Given these circumstances, it is essential to modify the conditions of conventional teaching methods. Revamping writing instruction is essential to boost motivation and create opportunities for students to freely envision. This necessitates a hands-on and efficient instructional method in writing courses (Gilbert & Macleroy, 2021; Regan et al., 2019). Educators significantly contribute to enhancing students' creative thinking abilities, imagination, and enthusiasm for crafting short stories. Certain tactics in a writing educational setting that can enhance creative thinking include acknowledging skills, fostering interactions, and gathering ideas prior to composing short stories (Bender, 2024; Ivcevic & Grandinetti, 2024). Composing short stories is the best writing endeavor to enhance creative writing abilities. Crafting short stories is another assignment that can incorporate multiple strategies, allowing students to create narratives, envision, and express their creativity.

2.2. Writing Short Stories Through Guided Writing Strategies

Generally, the writing model can be viewed through the stage model and the conception model. Moreover, additional experts have indicated that there are six phases of writing, which include grasping the material, choosing the topic, deciding the content, organizing thoughts, and composing (Gooding, Smith, & Mann, 2019; Regan et al.,

2019). This model emphasizes writing quality, yet the internal cognitive processes remain unexplored. According to cognitive theory, three interconnected aspects must be enhanced in the learning of creative writing: the task environment, long-term memory, and the writing process (Gilbert & Macleroy, 2021; Smyth, 2025). The author draws on long-term memory, produces innovative concepts, arranges thoughts, and expresses them. This thinking process consists of four phases: preparation, incubation, explanation, and verification. In this study, the social interaction model was utilized, grounded in social constructivism that highlights the social dimensions of learning (Boyd, 2025; Ivcevic & Grandinetti, 2024). The theory of creativity adds to this perspective by stating that creativity can arise not just from individuals but also through dynamic interactions involving technological tools, individuals, and various contexts. From this perspective, learning possesses a social character, and literary works serve as prompts for students' imaginative thinking. This imaginative thought can be generated from the outcomes of internalized conversation and the effects of social interaction (Bender, 2024; Tarp et al., 2020). It is believed that meaningful conversations between teachers and students can enhance students' advanced thinking abilities. Conversations with friends and receiving feedback can improve students' writing and raise the quality of their written work. Therefore, writing is not merely a process involving personal cognitive abilities; it is also social and conversational (Gallese, 2024; Punzi, 2021).

Drawing from the insights of cognitive theory and social interaction, the researcher crafted the phases of the framework for producing creative ideas via short story literature. Initially, the teacher offers students the opportunity to identify concepts such as characters, storylines, and events by having them make brief notes individually (Schleser & and Kerrigan, 2024; Xu et al., 2019). In the initial phase, learners may utilize Gen-AI as a source for idea generation. Additionally, students collaborate in their groups to exchange and develop diverse, new, and innovative concepts regarding story elements. This group dialogue is conducted via an online platform to share thoughts that enhance both personal and collective creativity. Peer scaffolding within this group helps students access the zone of proximal development and aids in the cognitive growth of writing skills (Crabtree et al., 2025; Hower, 2019). During the group discussion phase, student experiences can enhance creative writing materials and motivate students. Dialogue is also acknowledged as an effective method that can generate high-quality content. Following the group discussion stage, individuals are entrusted with autonomy and responsibility for writing. Students begin to write stories independently by initiating the development of imaginative narratives from the outcomes of brainstorming, discussions, and personal ideas. Therefore, the overall approach for guided writing, both individually and collectively, using Gen-AI involves students considering characters, events, and plots by utilizing Gen-AI as a resource. During the discussion stage, students share these elements to contribute ideas or concepts. In the final stage, students continue writing their projects on their own. The structure for guided writing techniques, both individually and collectively, utilizes resources such as peers, worksheets, portfolios, and technology.

3. MATERIALS AND METHODS

3.1. Design and Participants

This research employed a quasi-experimental approach to evaluate individual and group-guided writing techniques utilizing Gen-AI and digital novels to enhance students' creative writing abilities in short stories and creative thinking. This study involved 250 students aged between 20 and 23 years from Universitas Muhammadiyah Tangerang, Indonesia. Every participant in this study had no prior experience with individual and group-guided writing techniques centered on Gen-AI and digital novels. The choice of participants was made with attention to research ethics. Students completed a consent form to participate in the study if they were interested and without pressure. In this research, educational and teaching materials were developed with the participation of language instructors skilled in writing. In the initial phase, students were encouraged to cultivate ideas and interests in creative writing through a range of scaffolding methods, including Gen-AI, digital novels, and fictional

films. Gen-AI was utilized to explore different kinds of short stories featuring diverse themes and narratives. Digital novels and fictional movies served as frameworks featuring themes of animals, heroes, time travel, and the supernatural. Once the initial session was finished, students had the chance to jot down their thoughts on the learning sheet to aid them in transforming abstract ideas into written form. The learning sheet completed by students outlined key components of the short story to be utilized, including character traits, plot points, events, as well as various aspects of idioms and sentence structures. Then, learners engaged in group discussions to enhance ideas or spark new inspiration in the narrative. In the final phase, students independently returned to expand their notes on the learning sheet into a well-crafted short story. Every intervention session took place over a span of 15 weeks.

3.2. Guided Writing Intervention Design

In the initial stage, students receive materials from different scaffolds via Gen-AI technology, digital novels, and fictional movies to inspire creative thoughts and document them in the format of a learning sheet. This learning sheet aids students in crafting elements for short story ideas that can remain adaptable. Every student adheres to this guided writing meticulously at every step. Organized direction from the teacher is a component of the scaffolding that helps students concentrate and focus on every instruction provided. The educators participating in this research are those with a decade of experience in writing instruction. Researchers and educators discuss the steps involved to ensure that teachers understand each phase of teaching creative writing thoroughly. The writing procedure with guidance is shown in Table 1.

Table 1. Guided short story writing procedure.

Steps	Explained action	Time
1. Think	Brainstorm an idea	10 min
	Students are given five minutes to consider their writing ideas after the teacher presents the writing assignment (Learning sheet) and provides some examples.	
2. Tell	Talk about your thoughts with your peers.	15 min
	Working in three-person groups, students alternately share their preliminary writing concepts on the learning sheet.	
3. Draw	Draw your idea.	20 min
	Before writing, students sketch. Students use drawings to give their concepts tangible form during this phase.	
4. Write	Write a short story about your idea	35 min
	Students independently complete the writing assignments on the learning sheet, such as the introduction of an image or a short story, after generating ideas.	
5. Share	Share your work with classmates	15 min
	It is possible for pupils to get up from their seats and share their writing with their classmates. Students can stimulate their creative thoughts and imaginations by reading about other people's writing concepts and receiving feedback from their peers.	

The next stage involves discussion within the group. A group discussion lasts for 45 minutes to help students identify the story structure and key components of the narrative. Tasks in group discussions include teacher presentations, collaborative discussions, and sharing ideas. Group discussions explore the elements of short stories, including identifying characters, setting, time, plot events, and story conclusion, as well as methods for assessing these components. The teacher aids in the identification of these elements through various supports, including AI and brief fictional films. The ideas are presented concisely to clarify the outcomes of establishing the framework of the story components. Every student takes a turn to share their concepts, allowing peers to generate additional creative thoughts. The third phase involves each student individually transforming short story elements into a complete short story. In this concluding phase, students have the opportunity to independently complete their short stories.

3.3. Research Instrument

3.3.1. Assessment of Creative Thinking Skills

Students' creative thinking skills in their short stories are assessed using (Wu, 1998) Torrance Test of Creative Thinking (TTCT). Multiple indicators are included in this creative assessment: elaboration, which involves the number of supplementary ideas; originality, which relates to the uniqueness of ideas; and fluency, which relates to the diversity of ideas. This creativity assessment comprises two types of tests, specifically figurative tests and verbal tests. The figurative test requires students to devise a visual representation of the plot of the short story. The figurative assessment for the short story narrative evaluates four aspects of creativity: fluency, flexibility, originality, and elaboration. The reliability test results (α Cronbach) reveal that fluency scores 0.97, flexibility 0.95, originality 0.87, and elaboration 0.92. The verbal assessment requires students to jot down vocabulary from the literature they have read along with their definitions. The verbal assessment evaluates three aspects, with reliability scores for each aspect being fluency 0.98, flexibility 0.96, and originality 0.92.

3.3.2. Creative Writing Assessment of Short Stories

Creative writing is evaluated using the Composition Creativity Scale (CCS), developed by Tsai (2016). This scale includes five indicators: fluency, flexibility, originality, elaboration, and sensitivity. The rubric was created based on the creative writing criteria from Tsai (2016). Fluency measures the coherence of the short story's length. Flexibility assesses the diversity of language and viewpoints within the story. Originality refers to the uniqueness of the concept behind the story. Elaboration involves the quantity and diversity of vocabulary and expressions used. Sensitivity pertains to understanding the story's concept and precision in crafting it. The evaluation was conducted by two language educators. The researcher and the evaluator discussed the composition creativity assessment rubric to ensure a shared understanding of the evaluation criteria. An analysis using Spearman's Rank correlation coefficient was performed, revealing an r2 value of 0.740 ($p < 0.05$) during the pretest phase and 0.816 ($p < 0.05$) during the posttest phase. These values suggest a consistent agreement between the two assessors.

3.3.3. Focus Group Interviews

Interviews were conducted focusing on three groups to explore the effect of story writing interventions using different methods on students' creative thinking abilities. Students were invited to participate. Each student representative from the three groups participated in interviews to gather opinions and perspectives regarding the guided writing intervention, both individually and collectively. The interviews aimed to investigate students' viewpoints and experiences. Group interviews were chosen because they help students feel more comfortable and confident in expressing their experiences and opinions. Additionally, this format facilitated open and cooperative discussions among students. Some of the questions asked included "In what ways does the current experience of learning to write short stories differ from the past?" "What challenges arise during the process of writing short stories?" "Can the intervention enhance creative thinking abilities in crafting imaginative short narratives?" and "Does composing short stories provide opportunities for you to convey inventive ideas?"

3.4. Intervention Procedure

Pretest-posttest experimental design to examine creative thinking skills and compositional creativity. The method employed is a combination that can integrate both quantitative and qualitative data. During the pretest stage, students complete a pretest by composing a short story while focusing on creative composition for 40 minutes. Moreover, the evaluation employs the Torrance Test of Creative Thinking (TTCT) and the Creative Composition Scale (CCS). During the intervention stage, students participate in both individual and group-guided writing sessions utilizing Gen-AI technology, digital novels, and fiction films to enhance the quality of creativity

and compositional skills in the short stories they develop. During the posttest stage, students undergo the same assessment as in the pretest stage.

3.5. Data Analysis

Prior to conducting the analysis, it was confirmed that all data sets were complete. The gathered data were recorded and examined using SPSS. The analytical approach employed was descriptive statistics, which involved computing the mean and all standard data for each variable. The t-test was performed on paired samples to explore significant differences between the two phases, pretest and posttest, regarding both creative thinking levels and creativity in short story compositions. Moreover, qualitative data analysis was conducted using thematic analysis focused on significant themes derived from the outcomes of group interviews. Quantitative and qualitative data analyses were conducted independently and subsequently merged for interpretation. The outcomes of triangulated data enhance one another to provide comprehensive insights from different perspectives.

3.6. Ethical Considerations

Participants were involved in this study voluntarily and without coercion. All participants were asked to fill out a consent form to participate voluntarily. This study has received permission from Universitas Muhammadiyah Tangerang, Indonesia, as an affiliate of the participants involved. Additionally, the Ethical Committee of Universitas Muhammadiyah Prof. Dr. Hamka, Indonesia, granted approval for this study on April 5, 2023 (Ref. No. 1180/B.05.04/2023).

4. RESULTS

4.1. Students' Creative Thinking in Short Stories

The Torrance Test of Creative Thinking was used to assess students' creative thinking abilities, and the results were evaluated using a t-test. The analysis results are categorized into two aspects: the degree of verbal creativity in employing literary language for short story writing and figural creativity in shaping the outline of the written short story. The findings from the analysis of the creative test regarding the verbal creativity aspect are shown in Table 2. According to the analysis results, the scores for each creativity dimension during the pretest and posttest phases are as follows: fluency dimension score (Pretest: M = 11.06, SD = 7.23; Post: M = 28.45, SD = 12.45) (t = ÅÅ 9.46, p = 0.000***), flexibility (Pretest: M = 8.35, SD = 4.35; Posttest: M = 12.24, SD = 4.94) (t = ÅÅ 9.48, p = 0.000***), and originality (Pre: M = 14.45, SD = 7.36; Posttest: M = 29.58, SD = 18.42) (t = ÅÅ 9.26, p = 0.000***). The analysis results indicate that every aspect of creativity in the verbal creativity subtest exhibited a notable rise. According to the findings from the paired sample t-test, the verbal subdimension of creativity exhibited a notable rise, with the verbal pretest score recorded at (M = 28.68, SD = 16.36), and the posttest score measured at (M = 67.35, SD = 32.56) (t = -9.58, p = 0.000***). These findings demonstrate that students saw a notable boost in their overall Verbal creativity.

Table 2. Paired sample t-test of the verbal dimension creativity test of short story literary vocabulary in the pretest and posttest phases.

Aspect	N	Pretest		Posttest		t	df	p	ES
		M	SD	M	SD				
Fluency	250	11.06	7.23	28.45	12.45	-9.46	250	0.000***	1.93
Flexibility	250	8.35	4.35	12.24	4.95	-9.48	250	0.000***	1.75
Originality	250	14.45	7.36	29.58	18.42	-9.26	250	0.000***	1.32
Total	250	28.68	16.36	67.35	32.56	-9.58	250	0.000***	1.62

Note: ***p<.001.

In addition, Table 3 displays the examination of creativity within the figurative subdimension of the short story plot. According to the analysis results, for each subdimension of the figural test, the fluency scores from the pre-test and post-test were (Pretest: M = 12.15, SD = 6.48; Posttest: M = 19.87, SD = 8.43) (t = ÅÅ 9.76, p =0.000***),

flexibility scores (Pre: M = 9.46, SD = 4.68; Posttest: M = 10.56, SD = 4.50) (t = ÅÅ 5.67, p =0.001**), originality scores (Pretest: M = 9.63, SD = 6.78; Posttest: M = 16.24, SD = 9.35) (t = ÅÅ 7.24, p =0.000***), and elaboration scores (Pretest: M = 4.67, SD = 3.68; Posttest: M = 4.25, SD = 3.56) (t = 2.48, p = 0.168). According to the analysis results, students demonstrated a notable rise in creativity within the figural plot subdimension of short stories, as indicated by the creativity test outcomes. In general, the degree of student creativity in the figural plot subdimension of short stories showed a notable rise, with a pretest score (M = 29.15, SD = 16.83), while the posttest score rose to (M = 46.83, SD = 22.56) (t = 10.34, p = 0.000***). The analysis results indicated that various aspects of figurative creativity showed significant improvement, specifically fluency, flexibility, and originality. The elaboration dimension demonstrated a slight decline, yet it still attained a reasonably substantial level.

Table 3. Paired sample t-test of the figural dimension creativity test of short story elements in the pretest and posttest phases.

Aspect	N	Pretest		Posttest		t	df	p	ES
		M	**SD**	**M**	**SD**				
Fluency	250	12.15	6.48	19.87	8.43	-9.76	249	0.000***	1.53
Flexibility	250	9.46	4.68	10.56	4.50	-5.67	249	0.000***	0.84
Originality	250	9.63	6.78	16.24	9.35	-7.24	249	0.000***	0.94
Elaboration	250	4.67	3.68	4.25	3.56	2.48	249	0.170	-0.53
Total	250	29.15	16.83	46.83	22.56	-10.34	249	0.000***	0.91

Note: ***p<.001.

4.2. Creative Writing Ability

The creative writing skills of students were evaluated through a paired sample t-test utilizing a creativity scale for short story compositions. Table 4 displays the findings of the creative writing analysis in relation to the overall creativity of short story composition. According to the analysis results, there was a notable rise in students' creativity from the pretest to the posttest, with a pretest mean score (M = 22.86, SD = 5.35) increasing to a posttest mean (M = 27.86, SD = 6.35), t (26) = 6.93, p = 0.000 ***. Additionally, every aspect of compositional creativity demonstrated a notable rise in their corresponding scores as outlined below. The fluency dimension score demonstrated an improvement from the pretest to the posttest (Pretest: M = 5.78, SD = 0.95; Posttest: M = 7.56, SD = 0.98; t = 6.68, p = 0.000 ***), as evidenced by students' short story writing skills becoming more fluent and capable of generating longer and more cohesive narratives. Additionally, the flexibility score demonstrated a notable rise with a score (Pretest: M = 5.84, SD = 0.84; Posttest: M = 6.58, SD = 0.94; t = 6.46, p = 0.000 ***). From the flexibility dimension, students could create variations in their language use and adapt to the topic of composing short stories.

Additionally, the originality dimension score reveals a result (Pretest: M = 5.68, SD = 0.65; Posttest: M = 7.84, SD = 0.97; t = 7.56, p = 0.000 ***). The rise in originality is notably substantial when observed in how students think, which is hard to foresee, allowing them to create inventive and imaginative short stories. The elaboration dimension score indicates a value (Pretest: M = 5.54, SD = 0.73; Posttest: M = 7.30, SD = 0.92; t = 6.73, p = 0.000 ***). The elaboration dimension also exhibits a notable rise, highlighted by their capacity to convey thoughts with greater complexity and diverse linguistic expression. Additionally, the sensitivity dimension score demonstrated an improvement with a score (Pretest: M = 5.58, SD = 0.84; Posttest: M = 6.94, SD = 0.88; t = 6.74, p = 0.000 ***). This growth in the sensitivity aspect is reflected in students' ability to modify short stories to align with broader themes. Based on this explanation, it can be inferred that the overall subdimensions of the short story composition creativity scale significantly improved after students underwent guided writing interventions using Gen-AI and digital novels, both individually and in groups. Thus, this guided writing approach that utilizes Gen-AI and digital novels proves to be an effective technique for enhancing students' creativity in short story writing.

Table 4. Paired sample t-test of the composition creativity scale in the pretest and posttest phases.

Aspect	N	Pretest		Posttest		t	df	p	ES
		M	SD	M	SD				
Fluency	250	5.78	0.95	7.56	0.98	−6.68	249	0.000***	0.94
Flexibility	250	5.84	0.84	6.58	0.94	−6.46	249	0.000***	0.98
Originality	250	5.68	0.65	7.84	0.97	−7.56	249	0.000***	1.23
Elaboration	250	5.54	0.73	7.30	0.92	−6.73	249	0.000***	1.15
Sensitivity	250	5.58	0.84	6.94	0.88	−6.74	249	0.000***	0.98
Total	250	22.86	5.35	27.86	6.35	−6.93	249	0.000***	1.14

Note: ***p<.001.

4.3. Guided Writing Features Based on Gen-AI and Digital Novels That Contribute to Creative Thinking and Creative Writing Skills

According to the outcomes of the quantitative analysis, there were notable improvements in students' overall creative thinking abilities and their creative writing skills in short stories following the intervention. Additionally, qualitative analysis was conducted to identify the aspects of the guided writing framework that enhanced students' creative thinking abilities. Thematic analysis was performed on the writing features of different Gen-AI and digital novels. The analysis revealed that the guided writing attributes of various Gen-AI and digital novels significantly enhanced students' creative thinking skills by providing increased space and time for incubation with Gen-AI and digital novels, facilitating idea exchange among peers, enabling the visualization of abstract concepts or characters and the connections within each short story plot, as well as developing individual student portfolios to acknowledge accomplishments and foster appreciation. The opportunity to engage in a learning environment such as Gen-AI and digital novels encourages students to generate original, inventive, and limitless ideas. Students value the freedom of thought, which allows them to better express their inner creativity in their writing. Some excerpts from focus group discussions illustrate these initial characteristics.

"Gen-AI technology that offers references for short story concepts and reviews of short fiction films from digital novels can help students generate creative and limitless ideas during the incubation phase."

"The short story learning form sheet aids me in defining the structure and narrative of the short story that is to be created." Moreover, the learning format does not restrict the expression of concepts, allowing me to convey the ideas I develop during the incubation phase.

"This structured writing approach helps me discover fresh concepts for crafting short stories. Before, I had never received ideas for short stories like those about superheroes, but after engaging in learning activities, I became intrigued by creating short stories centered around that theme. I also had the chance to imagine the characters and storyline of the tale that I would create".

The second feature of the guided writing strategy based on Gen-AI and digital novels is that it provides opportunities for students to exchange ideas with their peers, which can trigger motivation and interest, encouraging them to generate new ideas from various perspectives. One student mentioned that a piece of their work shared on an online platform received positive feedback from friends. The activity of exchanging ideas and reading others' works can inspire new ideas or compositions in the development of their short stories, thereby enhancing students' creative thinking skills. Some interview quotes that describe this second feature are as follows.

"I can generate concepts following a brainstorming session. At first, my concept lacked the intrigue needed for a short story, but after discussing thoughts and reviewing the plot outlines of friends, I came up with a fresh idea that was more engaging, inventive, and original."

"The group discussion was the most engaging part as my friends shared numerous short story concepts that had never crossed my mind before. Upon completing this session, I found I could think more quickly as I received a variety of creative ideas."

"I believe that group discussions and brainstorming assisted me in defining the story outline and transferring it into the learning form sheet. This session also allowed me to talk about the concepts or topics I would work on and seek input from other friends. "

Another feature that significantly contributes to the Gen-AI-based guided writing strategy and digital novels, both individually and in groups, is the visualization of ideas, characters, and short story plots that are still abstract. This feature helps increase students' creative imagination abilities. In the short story learning sheet, students are given the opportunity to draw and describe their ideas. The images presented can include object maps and other visual aids to help students express their imaginations in more detail. This finding demonstrates that story visualization can enhance students' creative thinking abilities. Some interview quotes that describe this third feature are as follows.

"I like this short story writing learning because it helps me to describe the ideas in my mind concretely. In addition, this visualization of story ideas helps me in determining the composition of the short story that I will develop. I am more able to write down all the components of the short story that I imagine".

"When I watch cartoons on TV, I think this story is less interesting and boring. After I got this short story writing learning, I thought about changing the storyline that I imagined from the results of filling out the short story learning form".

I believe that altering the storyline will enhance the story's intrigue. According to observations from this group discussion activity, numerous students faced challenges in completing the learning form intended for story development. Nonetheless, following a group discussion session, students succeeded in discovering their own solutions to the issue by examining concepts from peers, Gen-AI, digital literature, and online resources. Moreover, the structure of guided writing, both individually and in groups, utilizing Gen-AI and this digital novel, includes various guided writing steps that assist students in creating personal portfolios at every stage. These results suggest that this guided writing approach, both individually and collectively, can enhance students' creative thinking abilities via student writing portfolios. The assignments completed by students serve as catalysts for enhancing their creative thinking abilities. Learners have the ability to create their own concepts. Portfolios and group discussions enable students to express, enhance ideas, boost writing confidence, and cultivate creative thinking skills. Both quantitative and qualitative data indicate that guided writing, whether done individually or in groups, utilizing Gen-AI and this digital novel, enhances students' skills in creative writing and short story composition.

5. DISCUSSION

This research examined how guided writing utilizing Gen-AI and digital novels influences creative thinking abilities and the creative writing of short narratives. The results of the research show that utilizing Gen-AI and digital novels for guided writing can enhance students' creative thinking abilities in terms of fluency, flexibility, and originality. This result aligns with earlier studies that indicated creative writing instruction can enhance students' imagination, particularly regarding their creative thinking skills. Strategies for guided writing that utilize Gen-AI and digital novels also enhance students' creative writing across all aspects of fluency, flexibility, originality, elaboration, and sensitivity. This discovery is supported by earlier research indicating that the Substitute, Combine, Adapt, Modify teaching method can enhance creative writing abilities and story prediction skills (Gidiotis & Hrastinski, 2024; Wilson, 2020). Various findings indicate that the social constructivist method in individual and group writing strategies, utilizing Gen-AI and digital novels, can enhance students' creative thinking abilities in writing. This occurs as group discussions that share creative ideas can enhance existing ideas, produce new ones, and contribute ideas for crafting short stories (Johnson, 2020; Newsome, 2024).

The support of Gen-AI technology, along with digital novels and fictional films during the incubation phase, offers students motivation to establish the structure of their short stories. This technology sparks students'

creativity and imaginative thinking by providing a variety of short story resources, thus inspiring them to express their ideas when developing stories. This discovery aligns with earlier research indicating that utilizing multimedia technology in literature education can enhance students' creative imagination abilities in generating additional literary works (Dixon & Cox, 2025; Martin et al., 2021). Moreover, employing Gen-AI scaffolding and digital novels can enhance vocabulary and spark creativity in short story structures. This is demonstrated by the rise in creativity of both verbal and figural sub-dimensions. This discovery aligns with the scaffolding theory of learning, indicating that employing suitable scaffolding methods during education, including both technological and media scaffolding, will enhance student competence more effectively (Haubrock et al., 2024; Zhukova et al., 2024). Through this support, students perceive their imagination and creative thinking as boundless, allowing them to freely share their innovative ideas (Logan & Grillo, 2023).

The subsequent discovery is that the structure of guided writing phases, both individually and collectively, utilizing Gen-AI and digital novels, can enhance creative writing across all aspects of fluency, flexibility, originality, elaboration, and sensitivity. The fluency aspect improves, evident in students' capacity to write short stories more effortlessly and create longer, more cohesive narratives. Greater flexibility is observed in the capacity to utilize language variations and adapt to the subject of short story writing. A rise in originality is observed in students' thought processes, which are hard to anticipate and capable of generating imaginative and novel short stories. Enhanced elaboration is characterized by their capacity to articulate concepts through the application of more intricate and diverse language (Sanabria-Z et al., 2024; Saritepeci & Yildiz Durak, 2024). Additionally, greater sensitivity is observed in students' ability to adapt short stories to broader themes. The outcomes of this research align with earlier studies indicating that technology-aided guided creative writing interventions enhance students' skills in composing short story literary pieces (Wang, 2024; Xu, Reiss, & Lodge, 2025). This growth is evident in every aspect of the short story, including language use, characters, imagery, plot complexity, and events.

The subsequent discovery reveals that multiple aspects of individual and group guided writing strategies utilizing Gen-AI and digital novels make significant contributions, such as offering additional space and time for incubation with Gen-AI and digital novels, enabling idea exchange with peers, cultivating the visualization of abstract concepts or characters, understanding the connections of each short story's plot, and developing individual student portfolios to foster recognition and success. The initial aspect of the guided writing approach utilizing Gen-AI and digital novels is creating an environment for incubation, allowing students to generate and articulate their ideas freely. This aligns with the creative theory suggesting that offering open space can enhance students' creative thought processes (Behrens et al., 2024; McLean et al., 2022). Furthermore, offering this free space creates opportunities for students to enhance their autonomy and independence. The following aspect is group discussions, which provide students with opportunities to share ideas and opinions (Weidmann, 2024). This session may enhance students' creative thinking abilities, as this group discussion framework offers constructive feedback to students, thereby enriching their creative ideas. This conclusion aligns with the theory that student creativity can be improved through social and material interactions within interdependent settings and the internalization process of critical support from peer feedback (Kukkonen, 2024; Synnes et al., 2021).

Another aspect of the Gen-AI-driven guided writing approach and digital novels is the visualization of concepts derived from short story components. Incorporating components from short stories, including characters, settings, events, plots, and more, aids students in enhancing their creative imagination. This discovery aligns with the theory that merging visual and verbal writing can enhance creative thinking abilities and foster students' writing concepts. The following aspect is the teacher's scaffolding, which involves adult assistance in directing the process of creative writing. This discovery aligns with earlier research that showed teacher scaffolding serves as a catalyst, stimulating students' thoughts and ideas that were once not fully developed (Anani, Nyamekye, & Bafour-Koduah, 2025; Carey, Davidow, & Williams, 2022). Moreover, educators can enhance motivation, transform the learning environment, and elevate the quality of the educational process, leading to students' competency successes (Ballerini et al., 2025;

Barandiaran & Pérez-Verdugo, 2025). The final aspect is the development of personal student portfolios throughout the guided writing process. Portfolios can enhance independence, boost motivation, and elevate students' creativity and compositional skills. This result aligns with earlier research indicating that student portfolios created throughout the learning process can enhance students' motivation to complete writing assignments and stimulate their creative thinking abilities (Paz-Baruch et al., 2025; Ten Peze et al., 2024).

6. CONCLUSION

The framework of guided writing strategies, both individually and in groups, based on Gen-AI and digital novels, can enhance creative thinking skills and creativity in writing short story compositions. The development of guided writing, following steps such as thinking, telling, describing, writing, and sharing, can improve students' creative thinking skills (fluency, flexibility, originality, elaboration) and creativity in writing short stories (fluency, flexibility, originality, elaboration, sensitivity). An increase in students' creative thinking skills and compositional creativity is observed in flexibility, which refers to the ability to use various languages and adapt to the topic of the short story. An increase in originality is evident in students' unpredictable and innovative thinking, leading to the production of creative short stories. The increase in elaboration is demonstrated by their ability to express ideas using more complex and varied language. Furthermore, an increase in sensitivity is reflected in students' capacity to align short stories with broader themes. Providing more time and space for development using Gen-AI and digital novels, offering colleagues opportunities to share ideas, practicing visualization of abstract concepts or characters, understanding connections between plot elements, and building individual student portfolios to recognize achievements, are features that significantly enhance creative thinking and the ability to craft creative short stories.

This research suggests that the combination of guided writing, whether done individually or in groups, can enhance the skill of writing creative short stories and also boost motivation for writing and creative thinking. The stages of guided writing that are structured effectively can improve the quality of short story components, which aid in learning theories, methods, and practices. This research has several limitations, such as lacking a control group for comparison, samples focusing solely on one educational level, not accounting for other advanced thinking skills, neglecting other language skills affecting writing, such as reading abilities, and emphasizing verbal creative assessment. Considering these limitations, the researcher proposes multiple recommendations for future studies, including incorporating a control group for comparison, using samples from different levels, exploring additional high-order thinking skills beyond creative thinking, assessing reading abilities, and implementing non-verbal assessments of student creativity, such as visualizing elements of short stories.

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