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ChatGPT as an Innovative Learning Medium for Fostering Creativity and Self-Directed Learning among Elementary Students

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Abstract

The suboptimal integration of technology into classroom learning remains a challenge at SD Al-Munawwar Panyabungan. Many students primarily use smartphones and other digital devices for entertainment, resulting in underdeveloped creativity and self-directed learning skills. This study aimed to describe the use of ChatGPT as an artificial intelligence (AI)-based innovative learning medium to promote the positive use of technology while fostering creativity and self-directed learning among elementary school students. A descriptive qualitative approach was employed involving 25 fifth-grade students. Data were collected through classroom observations, semi-structured interviews with teachers and parents, and documentation of learning activities. The findings indicate that ChatGPT helped students think more creatively, generate ideas independently, improve the structure of their writing, and develop greater self-confidence. These improvements were reflected in students' ability to produce more coherent narrative texts, use a wider range of vocabulary, and develop story ideas more independently after using ChatGPT during writing activities. In addition, students began to use digital technology more productively for learning purposes. The findings suggest that ChatGPT, as an AI-based learning medium, can foster students' creativity, self-directed learning, and positive digital literacy in elementary education. Practically, the results imply that the purposeful integration of ChatGPT into classroom instruction can serve as an alternative pedagogical strategy for elementary school teachers to develop students' writing skills, creativity, and self-directed learning through the responsible use of digital technology.
Keywords: ChatGPT; Artificial Intelligence; Elementary Education; Creativity; Self-Directed Learning; Digital Literacy.

INTRODUCTION

The rapid advancement of digital technology in the twenty-first century has fundamentally transformed nearly every aspect of human life, including education (Destiana et al, 2025).

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Teaching and learning are no longer confined to traditional classrooms and printed textbooks but have expanded into interactive and collaborative digital learning environments (Suhada et al, 2025). This transformation requires both teachers and students to adapt to new educational paradigms that emphasize critical thinking, creativity, collaboration, communication, and digital literacy as essential twenty-first-century competencies (Susandi et al, 2025). Consequently, contemporary education is expected not only to facilitate the transmission of knowledge but also to cultivate learners who are self-directed, innovative, and well prepared to meet the challenges and opportunities of the Artificial Intelligence (AI) era (Soegiarto et al, 2023).

Amid the rapid digitalization of education, evidence from classroom practice indicates that the use of technology among elementary school students has not yet been fully directed toward positive and educational purposes (Andini et al, 2025). Preliminary interviews with a fifth-grade teacher at SD Al-Munawwar Panyabungan revealed that many students had been using digital devices from an early age; however, these devices were primarily used for entertainment, such as playing online games, watching YouTube videos, and accessing social media with limited parental supervision. Several parents also expressed concerns that their children spent excessive time playing online games, often losing track of time, postponing homework, and showing a declining interest in learning activities.

This phenomenon is consistent with the findings of Susanti et al (2024)), who reported that Indonesian children spend more than three hours per day using digital devices for non-academic activities, while only a small proportion use them for learning purposes. This condition reflects an imbalance in digital literacy, where the ability to access technology is not accompanied by the capacity to use it effectively for educational purposes (Azizah & Astutik, 2025). If digital technology is not utilized wisely and purposefully, it may contribute to the emergence of a generation of *digital passive users*—children who are proficient in operating digital devices but lack the ability to use them creatively, innovatively, and reflectively for learning (Anggraini, 2025).

In the context of elementary education, this issue becomes even more complex because students are at the concrete operational stage of cognitive development, during which they still require guidance in managing their learning time, selecting appropriate learning resources, and understanding the purpose and meaning of learning itself (Susanto & Wulandari, 2024). At SD Al-Munawwar Panyabungan, for example, the classroom teacher reported that most students demonstrated low interest in narrative writing activities. When

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assigned a writing task, many students struggled to begin, found it difficult to generate ideas, and quickly lost focus. As a result, their written work tended to be brief, repetitive, and lacking in creativity.

These findings are consistent with the results of the Programme for International Student Assessment (PISA, 2022), which ranked Indonesian students' literacy performance 66th out of 81 participating countries, placing it below the average performance of OECD countries (Barro & Bianchi, 2022). One of the weakest areas identified was writing proficiency, which requires creative thinking, reasoning, and effective language use. Writing is a fundamental component of basic literacy and serves as the foundation for the development of Higher-Order Thinking Skills (HOTS) (Ahn, 2024).

The low level of students' writing creativity is closely associated with the continued use of conventional instructional approaches. Teachers tend to emphasize the final written product rather than the creative thinking process underlying its development (Asmara, 2025). Consequently, students have limited opportunities to engage in exploratory writing experiences. According to Sun et al (2020), creativity is the ability to generate ideas that are novel, useful, and original through divergent thinking processes, which can be fostered through open and interactive learning activities. Similarly, Vuk (2023) argued that creativity should be cultivated from the early years of elementary education so that students become accustomed to expressing ideas, using their imagination, and experimenting without fear of making mistakes.

In addition to creativity, another important aspect of learning is self-directed learning, commonly conceptualized as Self-Regulated Learning (SRL). Prasad & Sane (2024) defined SRL as students' ability to plan, monitor, and evaluate their own learning processes. Students with well-developed self-regulated learning skills do not rely solely on their teachers; instead, they are able to seek information independently, select appropriate learning strategies, and reflect on their learning progress (Yan & Carless, 2022). However, at the elementary school level, students' self-regulated learning often remains underdeveloped due to the predominance of teacher-centered instructional approaches. In such learning environments, teachers continue to dominate the instructional process, while students tend to assume passive roles as recipients of information (Woods & Copur-Gencturk, 2024).

Therefore, innovative instructional approaches are needed to foster students' creativity while promoting self-directed learning through the meaningful and productive use of digital technology. One promising innovation is the integration of Artificial Intelligence

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(AI) into the teaching and learning process. In recent years, AI has increasingly been incorporated into educational settings as a cognitive partner capable of providing personalized, adaptive, and interactive learning experiences (Dogan et al, 2023).

One of the most widely used AI applications in education is ChatGPT, developed by OpenAI. ChatGPT is a text-based large language model capable of understanding conversational context and generating relevant, informative, and interactive responses (Latip et al, 2026). In educational settings, ChatGPT can function as a virtual learning assistant, enabling students to ask questions, generate ideas, revise sentences, and receive instant feedback and suggestions for improving their writing (Nurjanah et al, 2024). Sudrajad et al (2024) found that the use of ChatGPT enhanced students' motivation and writing creativity by providing timely and context-sensitive feedback. Likewise, Niloy et al (2024), through the AI-Enhanced Creative Learning Model, argued that interactions between students and AI stimulate the generation of new ideas by encouraging learners to experiment, explore alternative perspectives, and reflect on their learning outcomes.

Nevertheless, the integration of ChatGPT into education also presents several challenges that deserve careful attention. A study conducted by Rahman & Watanobe (2023) found that excessive use of generative AI may lead students to become overly dependent on instant answers, thereby reducing their opportunities to develop critical thinking, problem-solving, and independent reasoning skills. Furthermore, the responses generated by ChatGPT are not always accurate or appropriate for specific learning contexts, making teacher guidance and content verification essential throughout the learning process. Another potential risk is the decline in the originality of students' work when they rely on AI-generated outputs without engaging in critical analysis, revision, and further development based on their own understanding (Sok & Heng, 2024). Therefore, previous studies have emphasized that the successful integration of AI in education depends not only on the sophistication of the technology itself but also on effective instructional design, students' digital literacy, and teachers' ability to facilitate the critical, ethical, and responsible use of AI in educational settings (Adeshola & Adepoju, 2024).

In the present study, ChatGPT was not positioned as a substitute for teachers or as the primary source of answers; rather, it was conceptualized as a cognitive scaffold that supports students' learning processes (Durgungoz & Kharrufa, 2026). Teachers continued to play a central role as learning facilitators by guiding students to formulate prompts independently, critically evaluate the quality of ChatGPT's responses, compare them with other learning

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resources, and further develop the generated content using their own language and reasoning. Through this pedagogical approach, the use of ChatGPT is expected to minimize the risk of overdependence on AI while maximizing the development of students' creativity, self-regulated learning, and digital literacy at the elementary school level (Sok & Heng, 2024).

In the context of SD Al-Munawwar Panyabungan, the integration of ChatGPT is particularly relevant because it has the potential to transform students from passive users of digital technology into active, creative, and self-directed learners. Through ChatGPT, students can develop narrative writing skills by composing prompts independently, generating ideas through interactions with AI, and improving sentence structure based on the feedback provided. This process not only fosters writing creativity but also promotes self-confidence, curiosity, and responsibility for learning.

Accordingly, this study was motivated by two main issues. First, the limited use of digital technology for educational purposes among elementary school students. Second, the relatively low levels of creativity and self-regulated learning in writing instruction. To address these issues, this study aims to explore the use of ChatGPT as an innovative learning medium for fostering creativity and self-regulated learning among elementary school students.

Theoretically, this study is expected to contribute to the growing body of knowledge on the integration of Artificial Intelligence (AI) in elementary education, particularly in the areas of literacy development, creative thinking, and self-regulated learning. Practically, the findings are expected to serve as a reference for educators in designing AI-supported instructional strategies that are effective, ethical, and contextually appropriate. Through this approach, teachers can guide students toward using digital technology as a meaningful learning tool rather than merely a source of entertainment, while students can develop greater awareness of how to use technology responsibly and purposefully to support learning anytime and anywhere.

By using ChatGPT wisely and responsibly, learning in elementary schools can be directed not only toward fostering students' academic competencies but also toward developing a generation of digitally literate, creative, and self-directed learners. Therefore, this study is considered timely and significant as an initial step toward developing a human-centered AI-supported learning model that is responsive to the evolving demands of education in the era of Generative Artificial Intelligence.

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RESEARCH METHOD

This study employed a descriptive qualitative approach to provide an in-depth exploration of the use of ChatGPT as an innovative learning medium for fostering creativity and self-regulated learning among elementary school students in the era of Generative Artificial Intelligence (Satriyawan et al, 2026). A qualitative approach was selected because the study focused on understanding the meanings, experiences, and perceptions of students, teachers, and parents regarding the use of artificial intelligence in the learning process, rather than on quantitative measurement or hypothesis testing. Accordingly, the study was designed to explore the phenomenon in its natural setting, as it occurred within the students' authentic learning environment (Hoadley & Campos, 2022).

The study was conducted at SD Al-Munawwar Panyabungan, Mandailing Natal Regency, North Sumatra, Indonesia. The school was selected because its students actively use gadgets in their daily lives; however, these devices have not been fully utilized for educational purposes. The research site was purposively selected as it aligned with the focus of the study, namely the positive and meaningful integration of digital technology among elementary school students. The participants consisted of 25 fifth-grade students, one classroom teacher, and three parents who were involved as additional informants to strengthen the validity of the research data.

The study was conducted over an eight-week period, from February to March 2026. During this period, ChatGPT-based learning activities were implemented twice a week in a scheduled manner, with each session lasting approximately 60–90 minutes, resulting in a total of 16 observed learning sessions. Observations were conducted throughout all sessions to obtain a continuous understanding of the development of students' creativity and self-regulated learning. Meanwhile, interviews were conducted at the beginning, middle, and end of the study to capture changes in the experiences and perceptions of the participants regarding the use of ChatGPT in the learning process.

In this study, the researcher served as the primary research instrument (key instrument) and was directly involved in the processes of data collection and analysis (Ganesha, 2022). This role included observing participants, conducting interviews, and interpreting the meanings underlying students' learning behaviors during their interactions with ChatGPT (Bitkina et al, 2020). Such an approach enabled the researcher to gain a contextual understanding of the dynamics of students' learning processes, including how they utilized technology to foster creative thinking and self-regulated learning (Proudfoot, 2023).

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All ChatGPT-supported learning activities were conducted under the supervision of the classroom teacher and the researcher. Access to ChatGPT was provided through the teacher's laptop connected to a classroom projector, as well as several smartphones owned by the school or the teacher, which were used alternately by small groups of four to five students. Before each learning session, the teacher provided explicit instruction on the ethical use of artificial intelligence, how to formulate simple and effective prompts, the importance of verifying ChatGPT-generated responses, and the prohibition against entering personal information into the system.

Students were then assigned various writing tasks, including composing narrative texts, writing character descriptions, and developing story ideas. They were encouraged to create their own prompts, discuss the responses generated by ChatGPT, evaluate and select relevant information, and subsequently develop it into their own written work using their own language and ideas. Throughout the learning process, the teacher acted as a facilitator by providing feedback on the quality of students' prompts, the accuracy and relevance of the information obtained, and the originality of their written work. This instructional approach positioned ChatGPT as a cognitive scaffold that supported students' learning rather than as a substitute for their own thinking and writing processes.

Data were collected using three primary techniques: classroom observations, in-depth interviews, and document analysis. Observations were conducted throughout the learning process to record students' active participation in using ChatGPT, their responses to the teacher's instructions, and the strategies they employed to generate writing ideas, organize paragraphs, and reflect on their written work. In addition, the observations documented changes in students' learning behaviors, including their willingness to ask questions, their ability to explore and elaborate on ideas, and their increasing tendency to learn independently rather than relying solely on the teacher (Arifin & Sanjani, 2024).

In-depth interviews were conducted to explore the participants' experiences, perceptions, and perspectives regarding the use of ChatGPT in the learning process. A semi-structured interview format was employed to enable the researcher to obtain rich, detailed, and contextually grounded data. The interviews involved the classroom teacher, several fifth-grade students, and three parents who were purposively selected based on their level of involvement in supporting their children's learning at home. Interviews with the classroom teacher focused on changes in students' learning behaviors, motivation, and creativity

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UIKA Universitas Ibn Khaldun Bogor
Edisi : Vol. 10, No. 2, Juni/2026, hlm. 456-479

throughout the implementation of ChatGPT-supported learning activities (Satriyawan et al, 2026)

nterviews with the students were conducted to explore their experiences of interacting with ChatGPT, their feelings about writing with the support of artificial intelligence, and their reflections on the development of their self-regulated learning. Meanwhile, interviews with the parents aimed to examine whether their children's use of digital devices at home had changed following the implementation of ChatGPT in classroom learning, whether there was an increased awareness of using technology for educational purposes, and how parents supported these changes. The interview data obtained from the three participant groups (the classroom teacher, students, and parents) were subsequently compared and analyzed through source triangulation to examine the consistency of the findings and enhance the trustworthiness of the study (Hoadley & Campos, 2022).

In addition to classroom observations and interviews, data were also collected through document analysis to provide supporting empirical evidence. The documents analyzed included students' writing samples produced before and after using ChatGPT, students' reflective learning journals, screenshots of students' interactions with ChatGPT, and photographs documenting classroom learning activities. These documentary data were used to provide visual and contextual evidence of changes in the quality of students' written work as well as the nature of their interactions with the AI-supported learning tool.

The study also employed students' reflective learning journals as a reflective data collection instrument. These journals provided students with an opportunity to document their experiences after interacting with ChatGPT, including the new ideas they generated, the challenges they encountered, and the strategies they used to overcome those challenges. The journals were completed at the end of each learning session, allowing the researcher to monitor the development of students' reflections continuously throughout the eight-week study. Analysis of these journals enabled the researcher to gain deeper insights into the development of students' learning awareness and their self-regulated learning in managing their own learning processes.

RESULT AND DISCUSSION

The findings of this study were obtained through classroom observations, semi-structured interviews, and document analysis conducted in a fifth-grade classroom at SD Al-Munawwar Panyabungan. The participants consisted of 25 fifth-grade students, one classroom teacher,

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and several parents who were involved as supporting informants. The study aimed to explore how the use of ChatGPT as an innovative learning medium could foster students' creativity and self-regulated learning while promoting the positive and educational use of digital technology.

Before the implementation of ChatGPT, writing instruction in the classroom was predominantly conventional and teacher-centered. Students tended to be passive, experienced difficulties in generating ideas, and lacked confidence in writing compositions. Initial classroom observations also revealed that students primarily used digital devices for entertainment purposes, such as playing online games and watching videos, rather than for learning activities. Furthermore, several parents reported to the classroom teacher that their children frequently spent excessive time using digital devices for entertainment, often losing track of time. These findings underscored the urgency of the study to promote more productive and educational uses of digital technology in elementary school learning.

Following the implementation of ChatGPT in Indonesian language instruction, particularly in composition writing activities, significant changes in students' learning behaviors were observed. The classroom teacher introduced ChatGPT as an AI-powered writing support tool that enabled students to generate ideas, expand their vocabulary, improve sentence structure, and obtain inspiration for writing topics. During the learning process, students were guided to formulate simple prompts to seek suggestions or ideas from ChatGPT and then develop their own compositions based on the information and inspiration generated through these interactions.

Interviews with teachers revealed that the use of ChatGPT has changed the way students begin learning activities, particularly essay-writing activities in Indonesian language classes: *"Before using ChatGPT, most students always relied on examples I provided. After they learned to create their own prompts, they were able to come up with ideas more quickly and felt confident enough to develop stories using their own words." (Teacher, Interview).*

The results of the observation show a significant increase in student learning activity. Previously, most students demonstrated low levels of creativity and independence. However, after the implementation of ChatGPT, students began to show an active, enthusiastic, and more confident attitude. They seemed more eager to write, were not afraid to try new ideas, and began to learn to write without always relying on the teacher.

The following presents the results of observations regarding changes in students' learning behavior before and after the implementation of ChatGPT.

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Edisi : Vol. 10, No. 2, Juni/2026, hlm. 456-479

Table 1. Observation Instrument for Students' Creativity and Independent Learning

No	Aspects Observed	Indicators	Before Using ChatGPT	After Using ChatGPT	Notes / Description of Changes
1	Fluency in Thinking	Students are able to generate new ideas while writing.	Low	Improving	Students are beginning to come up with ideas quickly and are able to write longer pieces.
2	Flexibility of thinking	Students are able to develop ideas from various perspectives.	Not very evident	Improving	Students write in a more varied manner, using different plot lines and themes.
3	Originality	Students write in their own style.	Less original	More original	Students' writing no longer imitates the teacher's example but is the result of their own exploration.
4	Elaboration	Students add details to their writing.	Minimal	Complete	Students' writing is more detailed and contains rich descriptions.
5	Learning Initiative	Students demonstrate a willingness to learn without being told to	Low	Improving	Students take the initiative to create their own prompts to generate writing ideas.

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UIKA Universitas Ibn Khaldun Bogor
Edisi : Vol. 10, No. 2, Juni/2026, hlm. 456-479

6	Time Management	Students are able to complete assignments on schedule.	Less organized	More disciplined	Students are more focused and complete assignments on time
7	Self-assessment	Students revise their writing on their own.	Rarely done	Often done	Students begin revising their writing based on feedback from ChatGPT.

The table above demonstrates positive changes across all observed indicators. Students not only became more creative in their writing but also exhibited greater self-directed learning. They were able to produce compositions with more coherent structures and a richer range of vocabulary. The teacher also observed that several students began developing more imaginative ideas beyond the examples generated by ChatGPT. The learning process, which had previously been predominantly teacher-centered and one-way, became more interactive, with students engaging in meaningful dialogue with AI to construct knowledge and develop their own ideas independently.

These observational findings were supported by a student's statement during the interview: *"Before, I did not know how to start my story. Now, I ask ChatGPT first, then I choose the idea I like best and rewrite it in my own words."* (S7, student interview).

The interview findings further corroborated the observational data. Semi-structured interviews were conducted with the classroom teacher, students, and parents to obtain a more comprehensive understanding of the changes in students' learning behaviors and attitudes toward the use of ChatGPT in the learning process. The interviews provided deeper insights into participants' experiences, perceptions, and responses regarding the integration of artificial intelligence into Indonesian language learning.

Table 2. Interview Instrument for the Use of ChatGPT in Learning

No	Respondent	Aspect	Indicator	Response	Qualitative Notes
1	Teacher	Pre-usage habits	Use of gadgets for entertainment	✓	Most students used devices mainly for gaming

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UIKA Universitas Ibn Khaldun Bogor
Edisi : Vol. 10, No. 2, Juni/2026, hlm. 456-479

2	Teacher	Learning interest	Increased engagement in writing	✓	Classroom became more interactive and focused
3	Teacher	Writing creativity Self-regulated learning	Improved idea generation	✓	Writing became more varied and imaginative
4	Teacher	Self-regulated learning	Independent task management	✓	Students showed higher responsibility
5	Student	Perception of ChatGPT	Learning became enjoyable	✓	Writing felt easier and more engaging
6	Student	Learning habits	Use of gadgets for writing.	✓	Leisure time shifted toward writing activities
7	Parent	Behavioral change	Productive use of gadgets	✓	Children used devices for learning at home
8	Parent	Support	Positive attitude toward ChatGPT	✓	Parents supported supervised use

Based on the interview findings, the teacher reported that the implementation of ChatGPT had transformed the classroom learning environment into a more engaging and enjoyable experience. Students who had previously been passive became more active in asking questions and participating in discussions. The teacher also stated that ChatGPT helped students generate ideas more quickly, improve sentence construction, and enhance their self-confidence in writing.

The teacher further explained: *"My students are now more confident in reading their writing aloud in front of the class. Even those who used to remain quiet have started asking questions and actively discussing the story ideas they developed."* (Teacher, interview).

Interviews with the students revealed that they enjoyed learning with ChatGPT because it provided a new and engaging learning experience. ChatGPT assisted them when

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they encountered difficulties in selecting a writing topic or constructing sentences. Many students described ChatGPT as a "learning companion" that was always available to provide guidance whenever needed. Several students also reported that writing had become easier and more enjoyable, as they were able to explore a variety of ideas without being afraid of making mistakes.

One student stated: *"Learning with ChatGPT is more enjoyable because when I forget certain words or have difficulty constructing sentences, I can ask ChatGPT for help first. After that, I revise the response to make it fit my assignment."* (S7, student interview).

Another student stated: *"I enjoy writing much more now. My stories used to be only one paragraph long, but now I can write several paragraphs because I have many more ideas."* (S9, student interview).

Meanwhile, interviews with several parents indicated that the use of ChatGPT had a positive impact on students' learning habits at home. Children who had previously used their gadgets primarily for playing games began using them for learning, writing, and reading activities. Parents expressed pride in observing positive changes in their children's behavior, noting that they had become more disciplined and productive. They also reported that their children frequently shared their writing assignments and discussed the ideas they had generated with the assistance of ChatGPT.

One parent explained: *"My child used to spend most of the time playing online games after school. Now, he opens ChatGPT to look for story ideas or complete writing assignments given by the teacher."* (P1, parent interview).

Another parent added: *"I have noticed that my child has become more independent. Whenever there is a writing assignment, he first tries to find information on his own before asking us for help."* (P4, parent interview).

he documentation of students' learning outcomes also demonstrated a significant improvement. Comparisons of students' compositions before and after the implementation of ChatGPT revealed clear differences in terms of content quality, text length, and language use. Prior to the intervention, students' writing tended to be brief, less organized, and limited in idea development. After using ChatGPT, however, their compositions became more comprehensive, coherent, and employed more varied sentence structures and richer vocabulary. In addition, students showed greater confidence when presenting and reading their written work aloud in front of the class.

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This finding was also expressed by one of the students: *"Now I'm no longer embarrassed to read my story aloud in front of the class because I think it is better and longer than before."* (S10, student interview).

Based on the triangulation of observations, interviews, and documentation, it was concluded that the use of ChatGPT had a positive impact on fostering students' creativity and self-regulated learning. ChatGPT functioned not only as a writing support tool but also encouraged students to use technology in a more responsible and productive manner. Students who had previously used digital devices primarily for entertainment began to utilize them as learning resources. Therefore, the implementation of ChatGPT successfully shifted the paradigm of technology use among students at SD Al-Munawwar Panyabungan from mere entertainment toward an innovative and educational learning medium.

The teacher further emphasized the benefits of using ChatGPT in the learning process: *"The most noticeable change is not only that the students' writing has improved, but also that their way of thinking has changed. They have become more proactive in seeking solutions instead of immediately waiting for answers from the teacher."* (Teacher, interview). Overall, the findings of this study demonstrate that the integration of ChatGPT contributed to the creation of a more active, creative, and self-directed learning environment. Students learned to interact with technology as a tool for thinking, writing, and reflecting, while teachers assumed the role of facilitators who guided and supported the learning process. As a result, learning became more meaningful and aligned with the needs of today's digital generation—a generation that is not only digitally literate but also capable of using technology responsibly and productively for personal growth and lifelong learning.

Discussion

The findings of this study indicate that the integration of ChatGPT into Indonesian language learning at SD Al-Munawwar Panyabungan had a significant positive influence on fostering students' creativity and self-regulated learning. These changes were evident not only in the improved quality of students' writing but also in their more positive attitudes toward the educational use of digital technology. Students who had previously been passive and highly dependent on their teacher began to demonstrate greater initiative, a willingness to experiment with new ideas, and an increased ability to reflect on their own learning processes. These findings suggest that the integration of Artificial Intelligence (AI) in primary education can serve as a catalyst for transforming the learning process into one that

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Edisi : Vol. 10, No. 2, Juni/2026, hlm. 456-479

is more autonomous, interactive, and oriented toward the development of twenty-first-century competencies.

These findings are consistent with the AI-based learning theory proposed by Chen (2025), which argues that artificial intelligence can create adaptive, personalized, and participatory learning experiences by providing students with immediate and contextually relevant feedback. In the context of this study, ChatGPT functioned as a cognitive learning partner that facilitated two-way interactions between students and the AI system. As a result, the learning process shifted from a traditional teacher-centered model to a more dynamic and interactive learning dialogue. Through its text-based conversational interface, ChatGPT supported students in generating ideas, improving sentence structure, and expanding their knowledge through the exploration of new perspectives and concepts. These findings also support the AI-Enhanced Creative Learning Model (AEC-LM) proposed by Romero (2025), which emphasizes that human–AI interaction can foster creativity by engaging learners in reflective thinking, experimentation, and open-ended exploration.

From the perspective of creativity, the improvement in students' ability to generate ideas and enrich their written compositions suggests that ChatGPT effectively stimulated divergent thinking, as described by (Dogan et al, 2023). Rather than simply copying ideas generated by the AI system, students began to integrate these ideas with their own personal experiences, elaborate on descriptions, and produce writing that reflected greater originality and individual expression. This finding is consistent with the concept of *little-c creativity* proposed by Sudrajad et al (2024), which refers to the everyday creativity that emerges when learners are provided with opportunities to imagine, explore, and experiment. Within the context of this study, ChatGPT functioned as an **e**xternal scaffold that encouraged students to express and develop their ideas through processes of cognitive internalization. Consequently, the students' compositions became more varied, meaningful, and original, providing concrete evidence of the development of their creative thinking skills.

Meanwhile, the development of students' self-regulated learning can be explained through the perspective of Self-Regulated Learning (SRL), as proposed by Carter Jr et al (2020) and further elaborated by Nilson & Zimmerman (2023). The SRL framework emphasizes that self-regulated learners are capable of planning, monitoring, and reflecting on their own learning processes. In this study, ChatGPT supported students in managing their learning independently by enabling them to formulate prompts as a form of planning, evaluate the responses generated by ChatGPT as part of the monitoring process, and write

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Edisi : Vol. 10, No. 2, Juni/2026, hlm. 456-479

reflective journals as a means of self-evaluation. These learning activities fostered the development of metacognitive awareness, allowing students to better understand how they learn and how they can continuously improve their own learning strategies.

In contrast to the findings of the present study, several previous studies have reported that the intensive use of ChatGPT and other generative AI technologies may also have negative consequences for the learning process when implemented without adequate pedagogical guidance (Rahman & Watanobe, 2023). Durgungoz & Kharrufa (2026) found that some learners tended to rely directly on AI-generated responses without engaging in independent analysis, evaluation, or idea development. Such practices may hinder the development of critical thinking, problem-solving skills, and learners' sense of responsibility for their own learning, as AI is treated primarily as a source of answers rather than as a tool for cognitive exploration. Similar findings were reported by Sok & Heng (2024), who cautioned that excessive dependence on AI systems may reduce students' opportunities to develop reasoning, argumentation, and independent decision-making skills when technology use is not accompanied by reflective and evaluative learning activities.

These contrasting findings were not observed in the present study because the implementation of ChatGPT was carefully designed within a structured pedagogical framework. Students were not allowed to copy ChatGPT-generated responses directly. Instead, they were guided to formulate their own prompts, critically evaluate the AI-generated responses, select relevant information, and further develop these ideas using their own language and personal experiences. Consequently, ChatGPT functioned as a cognitive scaffold that supported students' thinking processes rather than replacing their cognitive efforts. This pedagogical approach is consistent with the human-in-the-loop principle, in which AI serves as a tool to facilitate learning, while decision-making, critical reflection, and the production of original work remain the responsibility of students under the guidance of their teacher.

Furthermore, several studies have suggested that the use of generative AI may reduce the originality of students' written work when learners become overly dependent on AI-generated text. In such cases, students tend to accept AI-generated responses without revising them or adapting them to the learning context, resulting in creativity that is primarily reproductive rather than genuinely productive (Latip et al, 2026). However, the findings of the present study indicate a different pattern. Based on classroom observations and an analysis of students' written work, most participants used ChatGPT-generated responses as

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an initial source of inspiration to expand their ideas before modifying the storyline, selecting more appropriate vocabulary, and developing characters according to their own imagination. Consequently, the creativity demonstrated by the students reflected an active process of knowledge construction rather than the mere reproduction of AI-generated information.

These differences in findings indicate that the impact of ChatGPT on students' creativity and self-regulated learning is not solely determined by the presence of the technology itself, but is strongly influenced by learning design, the role of teachers, learners' characteristics, and the intended purpose of AI integration in the classroom (Nurjanah et al, 2024). When AI is used merely as a source of instant answers without adequate guidance, the risk of dependency and reduced independent thinking skills may increase. Conversely, when AI is integrated through learning strategies that emphasize exploration, reflection, and critical evaluation, the technology can enhance students' creativity, metacognitive awareness, and self-regulated learning, as demonstrated in the present study (Niloy et al, 2024).

These findings also support the perspective of Standage & Ryan (2020) within the framework of Self-Determination Theory (SDT), which emphasizes that learning autonomy increases when students are provided with opportunities to make their own decisions throughout the learning process. ChatGPT creates an autonomy-supportive learning environment by allowing students to interact without excessive pressure, explore various ideas, and receive non-evaluative feedback. Such a learning environment fosters a sense of competence and autonomy support, which in turn enhances students' intrinsic motivation to engage in continuous learning

The transformation of students' digital behavior also represents an important finding that strengthens the significance of this study. Prior to the implementation of ChatGPT, most students used digital devices passively for entertainment purposes. However, after the integration of ChatGPT into the learning process, technology use shifted toward more productive activities. This finding is consistent with Elbanna & Armstrong (2024), who emphasized the importance of positive digital literacy among young learners so that technology can be utilized as a means of creation and learning rather than merely as a source of entertainment consumption. In this context, ChatGPT functions as an AI-based learning tool that strengthens students' digital citizenship, enabling them to use technology in an ethical, responsible, and meaningful manner.

The triangulation analysis of data obtained from teachers, students, and parents also revealed strong consistency among the findings. Teachers perceived that ChatGPT improved

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Edisi : Vol. 10, No. 2, Juni/2026, hlm. 456-479

the quality of learning interactions and encouraged students' active participation. Students reported greater confidence because they were able to write without fear of making mistakes, while parents observed changes in their children's digital device usage habits at home. These findings indicate that the utilization of ChatGPT influences not only students' academic abilities but also the development of their learning habits and digital character. In other words, ChatGPT functions not merely as a writing support tool, but also as a transformative learning medium that mediates students' learning processes from both social and cognitive perspectives.

The improvement in students' creativity and self-regulated learning identified in this study also demonstrates its relevance to the Constructivist AI Learning Environment model proposed by Grubaugh et al (2023), in which AI plays a role in creating a digitally constructivist learning environment. Within this model, students actively construct their own knowledge through interactions with adaptive and responsive systems. ChatGPT provides students with opportunities to experiment, pose questions, and receive personalized feedback within meaningful learning contexts, thereby strengthening the process of independent knowledge construction.

From a pedagogical perspective, the findings of this study demonstrate that teachers play a crucial role as facilitators who guide the use of AI to ensure that it remains meaningful and ethical. As stated by Nurjanah et al (2024), the role of teachers in the AI era is no longer limited to serving as the primary source of information, but has shifted toward becoming learning coaches who assist students in utilizing AI critically and responsibly. In the context of this study, teachers were responsible for integrating ChatGPT into Indonesian language learning through a structured approach, while ensuring that students maintained an understanding of the boundary between AI-generated inspiration and the originality of their own ideas.

Therefore, the findings of this study reinforce the assumption that the utilization of ChatGPT can serve as an effective pedagogical strategy for developing two key competencies in 21st-century education: creativity and self-regulated learning. These two competencies play an essential role in preparing young learners to face the challenges of the artificial intelligence era. ChatGPT provides a concrete example of how technology can function in a human-centered manner—not by replacing the role of teachers or diminishing students' cognitive abilities, but rather by expanding their capacity to think, write, and engage in independent learning.

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Theoretically, this study expands the discourse on AI-integrated learning in primary education by providing empirical evidence that the implementation of artificial intelligence-based technologies can enrich literacy and writing learning processes. Practically, these findings provide insights for educators to develop learning models that balance human creativity and machine intelligence. Teachers can utilize ChatGPT as a co-educator or digital learning partner that supports the development of students' creative and reflective thinking abilities while preserving the humanistic values embedded in the learning process.

Considering the findings and supporting theoretical perspectives, it can be concluded that the integration of ChatGPT into primary education represents a strategic step toward developing a smarter, more inclusive, and adaptive education system in response to contemporary changes. The utilization of AI technologies such as ChatGPT creates opportunities for the emergence of a new learning ecosystem in which technology serves as a partner in developing human potential rather than a threat to students' critical and creative thinking processes. AI-based learning, when designed through appropriate pedagogical approaches, has the potential to become a bridge toward the development of a generation of learners who are creative, independent, and digitally responsible in the era of artificial intelligence.

CONCLUSION

This study concludes that the utilization of ChatGPT as an innovative learning medium in Indonesian language learning at SD Al-Munawwar Panyabungan has contributed to fostering creativity and self-regulated learning among primary school students while simultaneously directing digital technology use toward a more positive, productive, and educational orientation. Through activities involving prompt exploration, writing practices, and learning reflections, ChatGPT functioned as an AI-based learning partner that supported students in developing creative thinking, generating ideas independently, and building reflective learning awareness.

The development of creativity was demonstrated through students' ability to generate new ideas, expand vocabulary, and produce written compositions that were more coherent, descriptive, and original. Meanwhile, self-regulated learning was reflected in students' ability to plan, monitor, and evaluate their own learning processes without relying entirely on teachers. The empirical findings also revealed positive changes in students' digital device usage behavior. Before the implementation of ChatGPT-based learning, most students

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Edisi : Vol. 10, No. 2, Juni/2026, hlm. 456-479

primarily used digital devices for playing games or accessing entertainment content. After the integration of ChatGPT, students began utilizing technology to explore ideas, compose texts, seek information, and revise their written work. These changes indicate that ChatGPT can serve as a learning medium that supports the development of a more active, productive, and responsible learning culture.

These findings also demonstrate the development of students' digital literacy, which extends beyond the ability to operate digital devices (*digital skills*) and includes the ability to select, evaluate, utilize, and produce information critically, creatively, and responsibly. In this context, ChatGPT functions as a medium that encourages students to use technology as a tool for learning and creation rather than merely as a means of entertainment consumption. Therefore, AI-based learning contributes to strengthening digital literacy by emphasizing critical thinking skills, creativity, ethical technology use, and the meaningful utilization of digital resources.

Theoretically, the findings of this study strengthen the concept of AI-Enhanced Creative Learning, which explains that artificial intelligence can enrich learning experiences through adaptive, personalized, and reflective interactions. The findings also support the theory of Self-Regulated Learning (SRL), which emphasizes the importance of students' ability to manage and regulate their own learning processes. Furthermore, this study extends the discussion of digital literacy by demonstrating that the integration of generative AI into learning not only enhances academic skills but also develops students' abilities to use technology critically, ethically, and productively.

Overall, this study confirms that ChatGPT can function as a transformative learning medium in supporting Indonesian language learning in primary education. The integration of ChatGPT not only shifts the learning paradigm from conventional approaches toward more creative, reflective, and student-centered learning, but also contributes to strengthening digital literacy as one of the essential competencies of the 21st century. Therefore, the implementation of generative AI in primary education should be carefully designed and accompanied by teacher guidance to optimize students' creativity, self-regulated learning, and digital literacy in a balanced and responsible manner.

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