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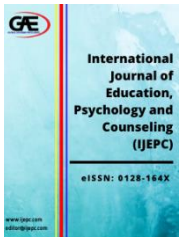

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ENHANCING VOCABULARY ACQUISITION AMONG YEAR 4 ESL LEARNERS THROUGH CHATGPT-ASSISTED COMIC CREATION

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Abstract:

This study investigates the effectiveness of ChatGPT-assisted comic creation in enhancing vocabulary acquisition among 40 Year 4 ESL learners in a Malaysian primary school. Traditional vocabulary instruction often emphasizes rote memorization, limiting learners' ability to retain and apply new words effectively. To address this, a two-month intervention was conducted where pupils generated personalized comics using ChatGPT, embedding target vocabulary in contextual narratives. A mixed-methods design was employed, incorporating pre- and post-tests alongside questionnaires. Quantitative results revealed a statistically significant improvement in vocabulary knowledge, with mean scores rising from 7.78 to 13.65 ($p < .05$). The most notable gains were observed among lower-proficiency learners, while higher-proficiency pupils showed refinement in advanced vocabulary use. Qualitative findings supported these outcomes, indicating that the integration of visual elements and context through comic creation improved comprehension and long-term retention. Pupils demonstrated the ability to use newly acquired vocabulary, ranging from A1 to C1 levels, in both academic and real-life scenarios. The findings highlight the pedagogical value of AI-assisted tools like ChatGPT in promoting vocabulary development through personalized, multimodal, and context-rich learning experiences. This research provides practical implications for ESL educators and curriculum developers seeking innovative approaches to vocabulary instruction.

Keywords:

Vocabulary Acquisition, ChatGPT, Comic, ESL Learners

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Introduction

Vocabulary acquisition is a crucial foundation in language learning, particularly for ESL (English as a Second Language) learners, as it significantly influences their communication abilities and overall language proficiency (Nation, 2013). However, conventional vocabulary teaching methods, such as rote memorization, frequently fail to engage learners meaningfully, resulting in limited retention and inadequate practical use of newly learned words (Laufer & Rozovski-Roitblat, 2015). This persistent challenge calls for innovative instructional strategies that actively involve learners and promote long-term vocabulary development.

Advancements in digital technology, especially AI-driven platforms like ChatGPT, present new opportunities to revolutionize vocabulary instruction by offering interactive, personalized, and context-rich learning experiences (Lin & Li, 2018; Hwang & Chen, 2019). One promising approach is the use of ChatGPT to facilitate the creation of personalized comics, where learners embed new vocabulary into creative narratives. According to Mayer's (2009) Cognitive Theory of Multimedia Learning, integrating visual elements with text enhances learners' memory and understanding. Supporting this, research by Shadiev et al. (2018) and Lin et al. (2020) demonstrates that digital storytelling tools significantly improve vocabulary comprehension and recall. Additionally, Abdullah and Yusof (2021) highlight the effectiveness of AI-generated content in boosting vocabulary retention, while Khan et al. (2022) emphasize the long-term benefits of interactive learning tools.

Despite the growing interest in digital tools for language education, there remains a notable lack of research specifically examining the impact of AI-powered platforms such as ChatGPT on personalized vocabulary learning for young ESL learners. Existing literature stresses the importance of personalized tools that accommodate individual learner differences to enhance vocabulary acquisition (Pane et al., 2017; Cheung & Slavin, 2016). Moreover, studies by Rahman and Farooqi (2023) and Omar et al. (2021) underline the critical role of immediate feedback from AI tools in improving vocabulary retention. Singh and Tan (2022) further confirm that AI-driven platforms boost learner engagement and vocabulary recall, while Lim and Ng (2020) argue that personalized learning environments foster more effective vocabulary acquisition.

This study aims to address this research gap by investigating the effectiveness of ChatGPT-assisted comic creation as a tool for enhancing vocabulary acquisition among Year 4 ESL learners. The research will evaluate vocabulary retention and practical application using pre- and post-intervention assessments and learner questionnaires. Existing evidence suggests that AI tools not only reduce learner anxiety but also stimulate creativity and critical thinking, which are vital for successful language learning (Ahmad & Lee, 2021; Chai et al., 2023). Furthermore, personalized multimedia approaches and interactive digital platforms have been shown to deepen engagement and promote vocabulary development (Rahimi & Asadollahpour, 2019; Wang & Kuo, 2020).

Problem Statement

Traditional vocabulary instruction methods insufficiently engage ESL learners, leading to poor retention and limited practical use of new vocabulary. While AI-driven platforms like ChatGPT offer promising personalized and interactive solutions, there is a scarcity of empirical evidence on their effectiveness in improving vocabulary acquisition for young ESL learners. This study

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seeks to fill this gap by exploring how ChatGPT-generated comics influence vocabulary learning outcomes among Year 4 ESL students.

Research Question

1. How does ChatGPT-generated comic creation impact vocabulary acquisition among Year 4 ESL learners?

Literature Review

Enhancing Vocabulary Acquisition

Vocabulary acquisition is a key part of learning a new language. For Year 4 ESL learners, it's especially important because it directly impacts their reading, writing, speaking, and comprehension skills. In order to truly master new words, pupils need to go through a few important steps for instances they need to be exposed to new vocabulary, understand its meaning, commit it to memory, and know how to use it appropriately in different contexts.

Recent research emphasizes that vocabulary learning works best when pupils engage in interactive, context-rich activities. For example, Ellis and Collins (2020) highlight that incorporating context into learning helps learners retain new words better. Similarly, Laufer and Rozovski-Roitblat (2015) argue that activities that move beyond just memorization like engaging tasks which can really boost vocabulary retention. This is where ChatGPT-assisted comic creation becomes valuable, as it offers an interactive and fun way to incorporate new vocabulary. Digital storytelling has proven to be an effective tool for boosting vocabulary retention. Lin and Li (2018) found that combining multimedia elements in storytelling helps learners understand and remember new words more easily. This fits perfectly with the concept of using ChatGPT to create personalized comics, where learners can integrate new vocabulary into engaging stories. Nakata's (2017) research on retrieval practice also supports this. He suggests that frequently using and recalling new words in meaningful contexts leads to better long-term retention. ChatGPT-assisted comic creation could provide this repeated exposure, giving learners multiple opportunities to interact with and refine their vocabulary in meaningful ways. Another key factor is personalized learning. Studies by Dabbagh and Kitsantas (2012) and Wang et al. (2014) show that when learning tools are customized to fit individual pupils' needs, the learning outcomes improve significantly. ChatGPT can adapt to each learner's level and interests, making vocabulary acquisition more effective and relevant.

In conclusion, using ChatGPT-assisted comic creation to improve vocabulary acquisition for Year 4 ESL learners taps into several proven educational strategies. The combination of interactivity, multimedia, retrieval practice, and personalized content aligns with recent research and offers a solid framework for improving vocabulary learning outcomes.

ChatGPT-Assisted Comic Creation

ChatGPT-assisted comic creation is an innovative way to use AI technology to help pupils create personalized, engaging comic strips that incorporate new vocabulary. This approach is an exciting way to enhance vocabulary acquisition among Year 4 ESL learners, aligning with the goals of the Malaysia Education Blueprint (2013-2025), which emphasizes integrating ICT to improve learning outcomes and boost English proficiency.

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One of the major benefits of ChatGPT for comic creation is that it provides an interactive learning experience. Pupils can engage directly with the AI to create their own content, which, according to Hwang et al. (2019), greatly enhances both engagement and vocabulary retention. By placing new vocabulary into the context of comic strips, ChatGPT helps pupils grasp words in a practical, real-world setting. This is supported by Laufer and Rozovski-Roitblat (2015), who emphasize the importance of contextual learning for vocabulary retention. Another significant advantage is the ability to tailor content to each pupil's level and interests. This personalized approach has been shown to improve learning outcomes, as highlighted by Dabbagh and Kitsantas (2012) and Wang et al. (2014). ChatGPT allows pupils to work with vocabulary that suits their individual needs, making learning more engaging and relevant.

The integration of multimedia which combining both text and visuals that also plays a big role in enhancing vocabulary retention. Dual coding theory, discussed by Lin and Li (2018), suggests that when learners process both verbal and visual information, it strengthens memory retention. This is exactly what happens when pupils create comics with ChatGPT, combining both words and images to learn new vocabulary. Moreover, ChatGPT provides repeated exposure and retrieval practice, which is crucial for vocabulary retention. Nakata (2017) emphasizes that recalling and using new words in meaningful contexts over time is key to long-term learning. By creating comics, pupils get multiple chances to engage with and reinforce their vocabulary.

Beyond vocabulary learning, ChatGPT-assisted comic creation also nurtures important 21st-century skills. Digital literacy, creativity, and problem-solving are all developed through this interactive process, which Beetham and Sharpe (2013) recognize as essential in modern education. What's more, using a fun and engaging tool like comics can boost motivation. Fredricks et al. (2019) found that interactive activities are great for keeping pupils motivated, which is crucial for language learning. ChatGPT helps pupils stay interested and engaged, addressing the challenge of maintaining high levels of motivation, as discussed by Barkley and Major (2020). ChatGPT's ability to provide instant feedback also supports learning. Shute (2008) emphasizes the importance of timely feedback in the learning process. ChatGPT's real-time support during comic creation helps pupils refine their work and improve their vocabulary usage.

Finally, the use of AI tools like ChatGPT in education is supported by recent advancements in AI research. Chen et al. (2020) and Xu et al. (2021) highlight how AI can transform learning experiences and outcomes. By creating personalized, context-rich educational content, ChatGPT is helping to shape the future of language learning in innovative ways.

Methodology

Research Design

This study adopted a mixed-methods design to investigate the impact of ChatGPT-assisted comic creation on vocabulary acquisition among Year 4 ESL learners. By integrating quantitative and qualitative data, the study aimed to capture both measurable vocabulary gains and the contextual learning experiences of participants. Quantitative data were collected through pre- and post-tests, while qualitative insights were drawn from structured questionnaires containing both closed- and open-ended items. This methodological approach

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enabled a comprehensive understanding of the intervention's effectiveness in supporting vocabulary development.

Research Participants

Purposive sampling was employed to select participants most aligned with the study's objectives, enhancing the relevance and depth of the findings (Steve et al., 2020). The sample consisted of 40 Year 4 pupils from an urban primary school in Kuala Lumpur. These participants were divided into two groups: 20 pupils from Class 4D enrolled in the Dual Language Programme (DLP), and 20 pupils from Class 4K following the mainstream curriculum. The inclusion of pupils with varying levels of English proficiency provided a broad perspective on the intervention's impact across learner profiles.

Research Instruments

Two instruments were used to assess vocabulary acquisition outcomes: pre- and post-tests**,** and questionnaires.

Pre- And Post-Tests

The pre-test was administered prior to the intervention to establish a baseline of vocabulary knowledge. The post-test was conducted following the two-month ChatGPT-assisted comic creation intervention. Both assessments consisted of multiple-choice items, matching tasks, and fill-in-the-blank questions designed to evaluate pupils' understanding, recall, and application of vocabulary items introduced during the lessons. The quantitative data were analyzed using descriptive statistics (mean, median, standard deviation) and paired-sample t-tests to assess the significance of vocabulary gains ($p < .05$).

Questionnaires

The questionnaire was designed to explore pupils' perspectives on vocabulary learning through comic creation. It included both quantitative items (Likert-scale and Yes/No questions) and qualitative items (open-ended responses). Quantitative responses were analyzed using descriptive statistics and chi-square tests to identify patterns and relationships in learners' vocabulary acquisition experiences. Qualitative responses were analyzed using thematic analysis, involving systematic coding and categorization to identify recurring themes related to vocabulary retention, contextual usage, and comprehension.

To enhance the trustworthiness of the data, triangulation was employed by cross-validating findings from the tests and questionnaires. This approach ensured that both quantitative outcomes and qualitative insights reinforced the study's conclusions on vocabulary acquisition.

Research Ethics

Ethical procedures were strictly observed throughout the study. Informed consent was obtained from all participants and their guardians after a detailed explanation of the research purpose, procedures, and potential risks. Confidentiality was maintained by assigning pseudonyms to all pupils and securely storing the data. Care was taken to monitor pupil well-being during the intervention, particularly regarding screen time and digital engagement. All research activities were conducted in accordance with ethical standards for research involving children and educational settings.

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Results And Findings

To analyse the research question which mainly discussing vocabulary acquisition, the researcher has conducted two instruments which are pre and post-test besides questionnaires. The questionnaires contained two parts which are the Likert Scale question and an open-ended questions. The following will be discussing the results and findings collected through the instruments.

Enhancing Vocabulary Acquisition: Pre- And Post-Test Analysis Of ChatGPT-Generated Comics Among Year 4 ESL Learners

Below is the table which displayed the comparison before and after the intervention conducted among the participants.

Table 1 : Differences Score For Pre And Post Test

Participants	Pre-test score	Post-test score	Difference in score
K1	4	10	6
K2	5	11	6
K3	7	13	6
K4	8	14	6
K5	2	15	13
K6	9	10	1
K7	1	8	7
K8	2	10	8
K9	2	11	9
K10	3	13	10
K11	4	15	11
K12	6	11	5
K13	5	13	8
K14	7	14	7
K15	10	15	5
K16	5	11	6
K17	7	14	7
K18	7	15	8
K19	7	15	8
K20	6	11	5
D1	7	15	8
D2	8	15	7
D3	10	15	5
D4	9	15	6
D5	8	14	6
D6	7	14	7
D7	10	15	5
D8	10	15	5
D9	15	15	0
D10	15	15	0
D11	11	15	4
D12	10	15	5
D13	11	15	4

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D14	14	15	1
D15	8	15	7
D16	8	15	7
D17	13	15	2
D18	12	15	3
D19	8	14	6
D20	10	15	5

The pre-test results revealed significant challenges in vocabulary acquisition, with participant scores ranging from 1 to 15. Lower-proficiency learners, such as K7 and K8, struggled with foundational A1-level vocabulary (e.g., "body," "face"), reflecting a substantial gap in basic word knowledge essential for language development. Even moderate-proficiency participants, like K6 and D5, with scores of 9 and 8 respectively, exhibited a limited vocabulary range, underscoring the need for targeted interventions.

The post-test results, however, demonstrated notable improvements across all proficiency levels, highlighting the effectiveness of ChatGPT-assisted comic creation in enhancing vocabulary acquisition. The most substantial gains were observed among lower-proficiency learners, such as K5, who improved by 13 points (from 2 to 15), mastering foundational A1-level words and expanding into A2 vocabulary (e.g., "gold," "camel"). Moderate-proficiency learners also progressed steadily, benefiting from the contextual and visual integration of B1-level words (e.g., "wrap," "mosquito," "hump") in the comics. The inclusion of more challenging B2 terms (e.g., "treasure," "mummy") enriched their vocabulary, promoting deeper engagement and learning.

Higher-proficiency participants showed modest but meaningful improvements, with gains of 1 to 5 points. These learners incorporated advanced vocabulary such as C1-level words ("pyramid") and B2-level terms ("tomb"), broadening their lexical repertoire and refining their existing vocabulary knowledge.

The intervention proved effective across proficiency levels by facilitating vocabulary acquisition at multiple levels ranging from A1, A2, B1, B2, and C1. It provided lower-proficiency learners with a strong foundation while challenging higher-proficiency pupils with complex terms, supporting vocabulary growth and mastery. These findings underscore the potential of ChatGPT-assisted comic creation to address diverse learner needs and enhance language proficiency in an engaging and context-rich manner.

Table 2 : Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pre-test	7.775	40	3.48	0.55
Post-test	13.65	40	1.96	0.31

The results from Table 2 show a clear improvement in vocabulary acquisition after the ChatGPT-assisted comic creation intervention. The average pre-test score was 7.78, with a standard deviation of 3.48, reflecting varied performance among participants. After the

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intervention, the average score rose significantly to 13.65, with a reduced standard deviation of 1.96, indicating not only improvement but also more consistent outcomes across the group.

The Standard Error Mean (SEM) for the pre-test was 0.55, compared to 0.31 for the post-test, suggesting greater accuracy and reliability in the post-test results. This highlights the positive impact of the intervention in providing a structured and effective learning experience.

The paired samples t-test reinforced these findings with a t-statistic of -13.66 and a highly significant p-value of 1.88×10^{-16}. This confirms that the observed gains in vocabulary were not random but directly linked to the intervention.

Table 3:Paired Samples Correlations

	N	Correlation	Sig.
Pre-test and Post-test	40	0.63	< 0.05

Table 3 above tabulate the paired samples correlations analysis yielded a Pearson correlation coefficient of 0.63, indicating a moderate positive correlation between the pre-test and post-test scores. This suggests that participants who performed better in the pre-test generally tended to perform better in the post-test as well. The p-value for the correlation is 1.42×10^{-5}, which is highly significant ($p < 0.05$). This confirms that the correlation between pre-test and post-test scores is statistically meaningful, further emphasizing the consistent improvements across participants following the intervention.

Insights From Questionnaires: The Role Of ChatGPT-Generated Comics In Enhancing Vocabulary Acquisition Among Year 4 ESL Learners

Apart from conducting the test, the researcher also run a questionnaire in the form of Likert Scale Questions with the participants to answer the first research question. The result is presented in the Table 4 below.

Table 4:Vocabulary Acquisition Likert Scale Questions

No.	Statements	Scale / No. of Respondents / Percentage (%)				
		1	**2**	**3**	**4**	**5**
1	**Making comics with ChatGPT helps me learn new vocabulary words better.**	0 (0)	0 (0)	0 (0)	18 (45)	22 (55)
2	**I find it easier to remember new vocabulary words when I use ChatGPT comics.**	0 (0)	0 (0)	0 (0)	15 (37.5)	25 (62.5)

Scale 1:Strongly disagree Scale 2:Disagree Scale 3:Neutral Scale 4:Agree Scale 5:Strongly agree

The feedback from Table 4 shows that ChatGPT-generated comics had a strong positive impact on vocabulary learning for Year 4 ESL pupils. For the statement, "Making comics with ChatGPT helps me learn new vocabulary words better," every participant responded positively, with 45% agreeing and 55% strongly agreeing, giving a mean score of 4.55. Similarly, for "I find it easier to remember new vocabulary words when I use ChatGPT comics," 37.5% agreed

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and 62.5% strongly agreed, with a mean score of 4.625. The complete lack of neutral or negative responses highlights how effective and engaging this approach was for learners.

Insights From Pupils On Using ChatGPT Comics To Learn Vocabulary

The insights gathered from the pupils about using ChatGPT-generated comics to learn new vocabulary revealed several valuable takeaways. Through two open-ended questions, participants shared how the intervention impacted their learning experience.

Question 1: What do you find helpful about using ChatGPT comics to learn new vocabulary words?

The pupils consistently highlighted the value of visuals in aiding understanding and retention. Many mentioned how the pictures in the comics brought vocabulary to life. One pupil shared, *"The pictures in the comic helped me understand words like 'mummy' and 'pyramid' because I could see them."* This shows how combining visuals and text made it easier for pupils to grasp and remember challenging words, such as "mummy" (B2) and "pyramid" (C1).

Another key benefit was engagement. Pupils expressed how creating comics made learning fun and interactive. One pupil said, *"Making comics with ChatGPT helped me remember words like 'treasure' and 'camel' because I saw the pictures and used the words in my story."* By actively using the words in their own creations, pupils felt more connected to their learning, which enhanced retention.

Additionally, pupils explained how the visual and narrative context of comics made abstract words more accessible. For instance, one pupil remarked, *"It was easy to learn words like 'mosquito' and 'ancient' because the pictures showed what they mean."* This demonstrates how comics bridge the gap between unfamiliar vocabulary and meaning, even for more advanced words.

Question 2: Can you share an example of a new vocabulary word you learned from a ChatGPT comic and how you used it?

The responses showed how pupils could transfer new vocabulary into real-life conversations and classroom activities. One pupil shared, *"I told my friend, 'I want to find treasure like pirates do!'"* after learning the word "treasure" (B2). Another said, *"I used it in class when I said, 'The pyramid is big and tall!'"* after learning "pyramid" (C1). These examples illustrate how the intervention gave pupils the confidence to apply new words in both social and academic contexts.

Pupils also used their newly learned vocabulary in everyday situations. For example, one explained, *"I learned 'mosquito' from the comic. I used it when I said, 'There were many mosquitoes outside last night.'"* This shows how the intervention made vocabulary relatable and useful beyond the classroom. Similarly, a pupil shared, *"I wrote, 'The treasure chest was full of gold!' in my story,"* demonstrating the creativity fostered by the comics.

Finally, one pupil said, *"I told my sister, 'Mummies are in Egypt, and they are wrapped up in cloth,'"* after learning "mummy" (B2). This highlights how the comics helped pupils connect vocabulary to real-world concepts, making words easier to remember and use in meaningful ways.

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The ChatGPT-assisted comic creation approach helped pupils learn vocabulary ranging from basic (A1) to advanced (B2 and C1) levels. The visuals, interactivity, and contextual nature of the comics significantly enhanced both understanding and retention. Pupils of all proficiency levels made notable progress, as evidenced by their ability to apply new vocabulary in creative, social, and academic contexts. This intervention not only improved vocabulary acquisition but also made learning more engaging and enjoyable for Year 4 ESL learners.

Discussion And Conclusion

Critical Discussion

This study examines the potential of ChatGPT-assisted comic creation to improve vocabulary acquisition among Year 4 ESL learners. Vocabulary is foundational to language learning, affecting skills like speaking, writing, and reading. However, effective vocabulary acquisition goes beyond just memorizing words which it requires engaging learners with context-rich, meaningful learning experiences. This is where ChatGPT-assisted comic creation comes in, offering an interactive and fun way for pupils to learn new words.

Recent studies emphasize the importance of context in vocabulary learning. For example, Ellis and Collins (2020) argue that integrating context into learning activities helps pupils retain new vocabulary better. This idea is echoed by Laufer and Rozovski-Roitblat (2015), who suggest that replacing traditional memorization with more engaging tasks leads to better retention. ChatGPT-assisted comic creation does exactly that it presents vocabulary in context, allowing pupils to see how words are used in various situations. This helps them not only understand the words but also use them in real-life scenarios, making the learning process feel more natural and less like a task.

Multimedia learning also plays a crucial role in vocabulary acquisition. Studies like those from Lin and Li (2018) show that combining images with text leads to better retention of new vocabulary. ChatGPT, by helping pupils create comics with both words and visuals, leverages this multimodal approach, reinforcing vocabulary through both verbal and visual elements. This is supported by Paivio's dual coding theory (2020), which suggests that information presented both visually and verbally is easier to remember. By using both modes of input, pupils can engage with the vocabulary in a more holistic way, which helps them remember and apply the words they learn.

Another key concept is retrieval practice, which is essential for vocabulary retention. Nakata (2017) explains that repeated exposure to new vocabulary helps pupils retain it over the long term. ChatGPT-assisted comics can provide repeated opportunities for pupils to use new words in different contexts, which reinforces their learning. This helps pupils not just memorize vocabulary but also internalize it, making it easier for them to recall and use the words later on.

Personalized learning is also critical to enhancing educational outcomes. Research by Dabbagh and Kitsantas (2012) and Wang et al. (2014) suggests that tailoring lessons to individual pupil needs improves engagement and results. ChatGPT stands out in this area, as it can adapt to each learner's unique level, interests, and preferences. This personalized approach makes vocabulary learning more relevant and engaging for each pupil, ensuring that they are challenged at an appropriate level and can progress at their own pace.

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The research aligns with existing theories and practices in language acquisition, particularly those emphasizing the importance of context, multimedia, and retrieval practice in learning vocabulary. For instance, digital storytelling has been recognized as an effective method for vocabulary acquisition, as it integrates text and visuals (Lin & Li, 2018). The ChatGPT-assisted comic creation in this research builds on this idea, taking digital storytelling further by integrating AI to create an even more interactive and personalized learning experience. This shows how technology can enhance traditional learning methods by providing pupils with more engaging and dynamic ways to interact with language.

Moreover, the connection between personalized learning and better educational outcomes is well-documented. Dabbagh and Kitsantas (2012) and Wang et al. (2014) argue that when learning experiences are tailored to meet pupils' individual needs, they engage more deeply with the material and learn more effectively. ChatGPT's ability to adjust to each learner's specific needs makes vocabulary learning not only more accessible but also more engaging. This reinforces the idea that personalized learning can lead to improved language outcomes, as pupils are given the tools and support they need to succeed at their own pace.

The increasing role of AI in education has also been widely discussed in recent years. Chen et al. (2020) and Xu et al. (2021) highlight how AI can provide personalized learning experiences that cater to individual pupils' needs. In this research, ChatGPT exemplifies this potential by offering personalized vocabulary lessons. This adaptability makes ChatGPT a powerful tool for helping ESL learners interact with vocabulary in ways that are both engaging and meaningful. The research, therefore, contributes to the growing body of work that highlights how AI can transform language learning by making it more personalized and engaging.

Implications Of The Research

The implications of this research extend both to teaching practice and educational theory. On a practical level, ChatGPT-assisted comic creation offers a fun and innovative way to teach vocabulary. Traditional vocabulary instruction often feels disconnected from real-life contexts, which can lead to disengagement. In contrast, the approach used in this research brings vocabulary to life by allowing pupils to interact with words in dynamic, creative ways. This not only helps them learn the words but also makes the learning experience more enjoyable, which is crucial for long-term engagement.

From a theoretical perspective, the research supports several important ideas in language learning, such as the value of interactive, multimodal learning environments. By combining text and images, comic creation reinforces vocabulary learning by appealing to different learning styles. Additionally, the repeated use of vocabulary during comic creation aligns with cognitive theories of memory, which emphasize the importance of repeated engagement with information to strengthen retention. The findings, therefore, highlight how interactive, multimedia-based learning can enhance vocabulary acquisition and retention.

This research also contributes to the growing field of personalized learning, illustrating how AI tools like ChatGPT can provide tailored educational experiences. Personalizing learning is critical for keeping pupils motivated and ensuring they get the support they need to succeed. ChatGPT's ability to adjust its lessons based on each learner's preferences makes vocabulary learning more engaging and relevant, which is vital for pupils' success in language acquisition.

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Suggestions For Future Research

While the findings of this research are promising, there are several areas that could be explored further. One important direction for future research is to investigate the long-term effects of ChatGPT-assisted comic creation on vocabulary retention. This research primarily focused on short-term effects, but it would be helpful to understand whether these benefits persist over time. Longitudinal research could provide more insight into the lasting impact of this approach on vocabulary acquisition.

Another area that could benefit from further exploration is the diversity of learners. This research focused on Year 4 ESL pupils, but it would be valuable to see how ChatGPT-assisted comic creation works with learners of different ages, language proficiency levels, and cultural backgrounds. Expanding the research to include a broader range of learners would provide a more comprehensive understanding of how this method can be adapted for various educational contexts.

Additionally, future studies could look into how combining ChatGPT with other digital tools might enhance vocabulary acquisition even further. While ChatGPT is a powerful tool on its own, integrating it with other technologies could create a richer, more immersive learning experience. For example, combining ChatGPT with speech recognition or pronunciation software could help pupils to improve their pronunciation and fluency as they work on their vocabulary.

Finally, it would be useful to investigate the impact of ChatGPT-assisted comic creation on other areas of language learning, such as grammar or writing. By broadening the scope of research, we could gain a more complete picture of how AI tools like ChatGPT can support various aspects of language acquisition, not just vocabulary.

Conclusion

To conclude, this research highlights the potential of ChatGPT-assisted comic creation to enhance vocabulary acquisition among Year 4 ESL learners. By combining AI with creative, interactive learning activities, pupils can engage with vocabulary in fun and meaningful ways. The findings support established theories on multimedia learning, personalized education, and retrieval practice, demonstrating that ChatGPT can play an important role in improving vocabulary retention and overall language learning outcomes.

This research also contributes to the growing body of work on AI in education, showcasing how AI tools can make learning more personalized, engaging, and effective. However, there is still much more to explore. Further research is needed to examine the long-term impact of this approach and its effectiveness with different learner populations. This will help refine the approach and ensure it can be used widely to enhance language learning.

Limitations And Recommendations Of The Research

This research shows that ChatGPT-assisted comic creation has great potential for improving vocabulary acquisition, but there are some limitations to consider. First, the research involved only 40 participants from one educational setting, which makes it difficult to apply the findings to a broader population. A larger research with diverse participants from different age groups, language proficiency levels, and cultural backgrounds would provide a clearer picture of its effectiveness. Second, the focus was entirely on vocabulary acquisition, leaving out other

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important areas like grammar, writing, and pronunciation. Without exploring these aspects, it's hard to know if the approach can improve overall language skills. Lastly, the study was conducted in a specific educational context, which may not reflect the realities of schools with varying levels of technological access or differing curriculum requirements

To overcome these limitations, future studies should include more participants from varied contexts to better understand how this method works in different settings. Future research should also investigate its impact on other areas of language learning, such as grammar and creative writing, to better understand its full potential.. Additionally, investigating challenges pupils face when using AI tools, such as navigation issues or misunderstanding feedback, could help refine the approach. Addressing these gaps will make the method more effective and widely applicable.

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