
Using Interactive Language Development Tools to Enhance Cognitive and Literacy Skills in K-12 Education

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ABSTRACT

The incorporation of interactive language technologies, such as ChatGPT, into K-12 education has sparked interest as a way to improve language acquisition and cognitive development. This qualitative study investigates the perspectives and experiences of educators enrolled in the Advanced Teaching MEd program who have implemented ChatGPT in their language classes. The study investigates the influence of ChatGPT on language competence, cognitive skills, and literacy development using educator interviews, classroom observations, and a comprehensive literature analysis. The findings underscore ChatGPT's dynamic and interactive nature, which encourages active involvement, knowledge production, and tailored support in the zone of proximal growth. Furthermore, the study demonstrates how ChatGPT improves language proficiency by offering authentic language experiences, timely feedback, and exposure to various linguistic structures. ChatGPT integration helps students become confident communicators and teachers construct dynamic classes that adapt to specific learning needs. Future research should look at the long-term impact of interactive language tools, the importance of teacher training, and the cultural and socioeconomic aspects that influence their use and efficacy. This work adds to the continuing efforts to improve language learning outcomes in K-12 education by increasing our understanding of how interactive language tools can boost cognitive development and language competency.

KEYWORDS

Interactive language tools; ChatGPT; K-12 education; Language learning; Cognitive development

ABSTRAK

Penggabungan teknologi bahasa interaktif, seperti ChatGPT, ke dalam pendidikan K-12 telah memicu minat sebagai cara untuk meningkatkan penguasaan bahasa dan perkembangan kognitif. Studi kualitatif ini menyelidiki perspektif dan pengalaman para pendidik yang terdaftar dalam program pengajaran Magister Pendidikan Bahasa Inggris lanjutan yang telah menerapkan ChatGPT di kelas bahasa mereka. Studi ini menyelidiki pengaruh ChatGPT pada kompetensi bahasa, keterampilan kognitif, dan pengembangan literasi menggunakan wawancara pendidik, observasi kelas, dan analisis literatur yang komprehensif. Temuan ini menggarisbawahi sifat dinamis dan interaktif ChatGPT, yang mendorong keterlibatan aktif, produksi pengetahuan, dan dukungan khusus di zona pertumbuhan proksimal. Lebih jauh lagi, penelitian ini menunjukkan bagaimana ChatGPT

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Alat bahasa interaktif; ChatGPT; Pembelajaran K-12; Perkembangan kognitif

meningkatkan kemahiran berbahasa dengan menawarkan pengalaman bahasa yang autentik, masukan yang tepat waktu, dan paparan terhadap berbagai struktur linguistik. Integrasi ChatGPT membantu siswa menjadi komunikator yang percaya diri dan guru membangun kelas dinamis yang beradaptasi dengan kebutuhan pembelajaran spesifik. Penelitian di masa depan harus melihat dampak jangka panjang dari alat bahasa interaktif, pentingnya pelatihan guru, dan aspek budaya dan sosial ekonomi yang mempengaruhi penggunaan dan kemanjurannya. Pekerjaan ini menambah upaya berkelanjutan untuk meningkatkan hasil pembelajaran bahasa di pendidikan K-12 dengan meningkatkan pemahaman kita tentang bagaimana alat bahasa interaktif dapat meningkatkan perkembangan kognitif dan kompetensi Bahasa.

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INTRODUCTION

The use of interactive language technologies, such as ChatGPT in K-12 education has gained traction as a way to improve language acquisition and cognitive development. This study investigates how the integration of ChatGPT can be used for ESL (English as a Second Language) learning objectives. Drawing on well-known theories of cognitive development, constructivism, and sociocultural learning, it is necessary to explore how ChatGPT as language development tools could help students improve language competence, cognitive abilities, and literacy (Pitso, 2023; Yee *et al.*, 2023).

The inclusion of interactive language technologies is consistent with constructivist and sociocultural learning ideas (Bonk & Cunningham, 2012). ChatGPT allows students to construct information, sharpen cognitive capacities, and improve language skills through meaningful conversations. Students can engage in authentic language experiences and receive individualized guidance using AI technology such as ChatGPT in promoting language acquisition and cognitive progress.

Integrating ChatGPT improves language skills by providing authentic and interactive language experiences. Students engage in conversations, which helps them improve their listening and speaking abilities by providing quick feedback (Baskara, 2023). ChatGPT also improves writing skills by supporting students with ideation, sentence structure, and grammar in written works (Hwang *et al.*, 2023; Maspul, 2023). Furthermore, the application exposes students to a variety of linguistic structures, idiomatic expressions, and terminology, helping them improve their language skills and cultural knowledge (Roza & Zulhirawati, 2023).

Teachers can use ChatGPT to create dynamic and interesting lessons through a variety of activities. For example, students can practice certain language skills through guided talks. They can also work together on writing projects and receive real-time feedback via ChatGPT to improve their compositions (Küchemann *et al.*, 2023). These interactive language tools offer novel approaches to improving language ability, allowing students to become more confident and successful communicators.

Furthermore, using interactive language technologies like ChatGPT in K-12 teaching encourages cognitive development and language proficiency. Students improve information, cognitive capacities, and linguistic skills by actively engaging with the instrument. ChatGPT

improves listening, speaking, reading, and writing skills by offering authentic language experiences and exposure to various linguistic structures. Teachers can create dynamic lessons that help students become confident communicators in their target language.

METHOD

This qualitative study explores the integration of ChatGPT in the learning of languages using insights from educators in the Advanced Teaching Master of Education program, classroom observations, and a comprehensive literature analysis. Educators with prior expertise in implementing technology into their classrooms will be carefully chosen. Focus group discussions were held to acquire their perspectives, experiences, and issues regarding ChatGPT integration. Furthermore, classroom observations provided useful information about the implementation process and student participation. Thematic analysis used to discover recurring themes, which backed by a comprehensive literature review.

RESULT AND DISCUSSION

Educators are constantly looking for effective tools that encourage the development of foreign language skills while also including cognitive and literacy strengths for K-12 learners. Interactive tools have been shown to improve both language learning and cognitive development (Kurvers *et al.*, 2015; Rodríguez *et al.*, 2014; Nikolajeva, 2015). This section will look at relevant theories and research that support the use of interactive technologies like ChatGPT in K-12 education.

Meanwhile, Piaget's (1950) theory of cognitive development highlights how people actively generate their knowledge and understanding via interactions with their surroundings. Piaget claimed that cognitive development occurs in phases, each marked by distinct thinking patterns and capacities (McLeod, 2018). When students use interactive language tools like ChatGPT, they actively participate in the learning process by generating responses, gathering information, and interpreting the AI's comments. This active participation aids their cognitive growth as they traverse and manipulate language structures, improve their problem-solving abilities, and build their comprehension of the language.

Vygotsky's (1978) sociocultural theory examines the role of social interactions and collaboration in cognitive development. Vygotsky contended that learning occurs through interactions with others, particularly more informed persons, in the "zone of proximal development." The zone of proximal development is the difference between a learner's current abilities and their potential abilities when guided and supported by a more competent individual (Daneshfar & Moharami, 2018; Varenikina, 2003). By using interactive language tools such as ChatGPT, students can interact with an AI that provides quick feedback, assistance, and suggestions for future exploration. This simulates social interactions while also scaffolding their cognitive growth by providing support and expanding their language skills within their zone of proximal development.

These theories promote the use of interactive language technologies into K-12 education because they are consistent with constructivist and sociocultural learning concepts. Students can actively engage using ChatGPT to create their knowledge, strengthen their cognitive capacities, and develop language skills through meaningful exchanges.

Enhancing Language Proficiency

Improving language competency is a critical goal in foreign language teaching, and the use of novel interactive tools such as ChatGPT provides exciting opportunities to accomplish this goal. ChatGPT allows students to engage in authentic and interactive language experiences, promoting meaningful language use and exposure to varied linguistic structures. Research has shown that interactive language tools improve students' listening, speaking, reading, and writing skills (Chapelle, 2001).

ChatGPT gives students a unique opportunity to actively participate in conversations and improve their spoken communication abilities. By conversing with the AI-powered system, students can develop their listening and speaking skills while receiving quick feedback on their language use (Chen *et al.*, 2023). Students, for example, can use ChatGPT to engage in role-playing scenarios, conduct interviews, or play interactive language games, all of which help them improve their communication skills in a relaxed setting.

In addition to spoken language skills, ChatGPT helps to build written proficiency. Students can use the system to generate ideas, receive sentence construction suggestions, and check the grammar and vocabulary in their written writings. This interactive help not only improves students' writing abilities, but it also fosters independent writing capabilities (AlAfnan *et al.*, 2023). For example, students can participate in a writing project in which they compose a tale or an essay using ChatGPT, honing their writing skills with the system's help and criticism.

Furthermore, ChatGPT introduces students to a diverse set of language structures, colloquial expressions, and terminology. Interactions with the AI expose students to a variety of language patterns and allow them to study how native-like language is utilized in context. This exposure improves their language skills by broadening their understanding of grammar, vocabulary, and collocations. For example, students can engage in discourse via ChatGPT to gain a better grasp of cultural factors, current events, or subject areas important to their language learning journey.

The use of interactive language tools such as ChatGPT into the classroom is an innovative approach to language training. By combining ChatGPT into numerous activities, teachers may create dynamic and interesting classes. For example, in a conversational practice session, students can have guided conversations with ChatGPT that focus on certain language abilities like asking and answering questions, expressing opinions, or discussing a topic. This practice provides a supportive setting for students to practice their speaking abilities and receive instant feedback, so promoting their language development.

Furthermore, interactive language tools such as ChatGPT provide novel strategies to improve language competency among K-12 learners. These technologies enable authentic and interactive language experiences, increasing meaningful language use and exposure to a variety of linguistic structures. ChatGPT allows students to actively participate in conversations, improve their oral and writing communication skills, and deepen their grasp of the target language. Teachers can use ChatGPT to construct dynamic classes that promote language competency and empower students to become more confident and effective communicators in the target language.

Cognitive Benefits of Interactive Tools

The use of interactive tools in language learning not only improves linguistic competency, but it also promotes cognitive growth in kids. ChatGPT requires students to think critically, assess information, and respond coherently. These cognitive processes promote the development of problem-solving skills, creativity, and logical thinking (Ziegler, 2016; Vinther, 2012).

Interaction with ChatGPT requires active cognitive processing and language production. Students must think carefully about their questions, responses, and the context of their discussions. For example, when speaking with ChatGPT about a certain topic, students must analyze and synthesize material in order to provide relevant and meaningful responses. This cognitive engagement encourages students to think thoroughly about the content and structure of their language, which fosters higher-order thinking skills like analyzing, evaluating, and synthesizing information.

Furthermore, the usage of interactive tools can promote psychomotor brain development. When students use ChatGPT, they activate various brain areas associated with language processing, memory, and motor coordination. For example, typing or conversing on a computer requires fine motor skills as well as coordination between cognitive and physical processes. This involvement promotes the development of psychomotor abilities, such as finger motions and hand-eye coordination (Sarı *et al.*, 2017; Alkhezzi & Al-Dousari, 2016).

Innovative approaches for using interactive tools like ChatGPT in the classroom to improve cognitive development include:

Using ChatGPT as a resource, teachers can create collaborative problem-solving exercises that require students to collaborate in groups to complete assignments (Siiman, 2023). For example, students can work together to study and provide a solution to a real-world problem. This activity promotes collaborative thinking, communication, and the use of cognitive skills like critical thinking, problem-solving, and decision-making.

To foster inquiry-based learning, students can use ChatGPT to investigate open-ended inquiries or conduct research on specific themes. Kılınç (2023) suggests that students can use ChatGPT to ask questions, gather information, and assess responses. This approach encourages inquiry-based learning, in which students actively explore and analyze information, make hypotheses, and reach conclusions. The cognitive processes involved in researching, assessing, and synthesizing information promote critical thinking and information literacy.

Incorporate reflective writing exercises after students participate with ChatGPT. Students can reflect on their language learning experiences by putting down their thoughts, observations, and reflections. This increases metacognitive awareness when students reflect on their cognitive processes, language use, and learning strategies. Reflective writing helps to improve self-regulation and metacognitive skills, which are necessary for lifelong learning (Elkhodr *et al.*, 2023; Alshahrani, 2023).

Furthermore, the use of interactive tools such as ChatGPT in language learning not only improves linguistic competency but also promotes cognitive development among students. ChatGPT requires critical thinking, analysis, and coherent language construction, which helps to develop problem-solving skills and logical reasoning. Furthermore, the use of interactive technologies enhances psychomotor brain development by engaging students in activities that activate various parts of the brain involved in language processing and motor coordination. Educators can support cognitive development in learners by adding creative ideas like

collaborative problem-solving, inquiry-based learning, and reflective writing. These approaches enable students to think critically, actively engage with language, and build higher-order cognitive abilities that are required for success in language learning and beyond.

The Role of Interactive Language Tools in Cognitive Development

The use of interactive language technologies, such as ChatGPT, in the classroom has enormous potential for improving students' cognitive development. These tools provide an engaging platform for students to observe and participate in dynamic interactions, which promotes cognitive growth (Vázquez-Cano *et al.*, 2023; Bai *et al.*, 2023). K-12 educators can create an organized environment for cognitive growth by allocating one hour per day to constantly monitor students' activities and interactions with ChatGPT.

One of the key reasons that interactive language tools promote cognitive growth is their capacity to stimulate critical thinking. ChatGPT encourages students to examine material, assess responses, and think critically in order to generate logical and relevant questions or responses (Mondal *et al.*, 2023; Bai *et al.*, 2023). For example, in a language learning session, students can utilize ChatGPT to ask open-ended questions about a topic they are studying. They must critically assess the AI's responses, taking into account the quality and usefulness of the material presented, before formulating follow-up questions or conducting additional research. This process of critical thinking improves their cognitive abilities since they are actively engaging with the tool and processing information in a meaningful and analytical way.

Furthermore, interactive language technologies such as ChatGPT can help learners improve their literacy skills. Students can read and study the AI's responses as they interact with it, exposing them to new terminology, sentence structures, and ideas. This exposure helps them improve their language and comprehension skills (Rahman & Watanobe, 2023). For example, in a literature lesson, students can use ChatGPT to discuss and evaluate complex literary works. They can investigate the AI's interpretations, critically analyze them, and engage in meaningful debates about the themes, characters, and symbolism found in the book. This procedure improves not just their literacy skills, but also their cognitive capacities to examine and evaluate complicated concepts.

There are numerous innovative concepts for using interactive language technologies in the classroom, such as ChatGPT, to improve cognitive development. Socratic inquiry is a successful method (Guo & Lee, 2023). Teachers should encourage students to use ChatGPT as a tool for researching and discussing complicated issues. Socratic questioning allows students to critically assess the AI's responses, ask probing questions, and engage in meaningful debates. For example, in a social sciences class, students can utilize ChatGPT to learn about historical events and discuss their origins, repercussions, and significance. This encourages higher-order thinking abilities like evaluating arguments, synthesizing data, and reaching logical conclusions (Meija & Sargent, 2023).

Interactive language technologies can also help to facilitate debate and argumentation activities. Students can use ChatGPT to obtain knowledge and evidence to back up their arguments or counterarguments (Bishop, 2023). For example, in an environmental dispute, students can utilize ChatGPT to obtain statistics, expert comments, and supporting evidence to back up their points. This practice promotes cognitive processes such as analysis, assessment, and reasoning by engaging students in logical and persuasive debate.

Additionally, interactive language technologies can be employed to foster creativity and imagination. Teachers can provide creative writing assignments that require students to interact with ChatGPT for inspiration or ideas. Students can engage in imaginative storytelling or create fictitious characters and locations (Antar, 2023, Mallet, 2010). For example, in an English language arts class, students can utilize ChatGPT to produce narrative beginnings, character profiles, and plot twists. This practice encourages cognitive functions such as imagination, creativity, and problem-solving by having students generate and explain their ideas. Furthermore, interactive language technologies like ChatGPT play an important role in cognitive development. These tools promote critical thinking and cognitive capacities by helping students to analyze information, assess replies, and think critically.

Furthermore, interactive language tools can help students improve their literacy skills by introducing them to new vocabulary, sentence structures, and ideas. Educators can effectively use interactive language tools to promote cognitive development in students by adding novel ideas such as Socratic questioning, debate and argumentation, and creative writing prompts. These approaches enable students to think critically, actively engage with language, and build higher-order cognitive abilities that are required for success in language learning and beyond.

Enhancing Cognitive Skills

Engaging with interactive language tools, such as ChatGPT, not only promotes language development but also improves students' cognitive capacities. These tools promote critical thinking, problem-solving abilities, and creativity through active engagement and the development of coherent responses (Marbun, 2023; Supriyadi & Kuncoro, 2023).

One key way that interactive language tools improve cognitive skills is by encouraging critical thinking. When students interact with ChatGPT, they must examine the material supplied and assess the AI's responses (Xi *et al.*, 2023; Bai *et al.*, 2023). This technique promotes critical thinking by having students examine the correctness, relevance, and reliability of the information. For example, in a history lecture, students can utilize ChatGPT to investigate and debate difficult historical events. By critically studying and assessing the AI's responses, students improve their critical thinking skills, make informed decisions, and find logical errors or holes in their comprehension.

Furthermore, interactive language tools improve problem-solving skills. Students are encouraged to use their knowledge and reasoning abilities to solve difficult issues or problems (alt *et al.*, 2023; wood *et al.*, 1976). In a mathematics lesson, for example, students can use ChatGPT to get help completing complicated equations or word problems. By participating in the problem-solving process with the assistance of AI, students increase their analytical thinking, logical reasoning, and capacity to design methods to overcome barriers.

In addition to critical thinking and problem-solving, interactive language tools encourage students' creativity. These tools expose students to a variety of viewpoints, ideas, and ways of thinking, which can stimulate creative thinking and enable students to produce novel solutions or ideas (Filippi, 2023; Taveekitworachai & Thawonmas, 2023). In an art lesson, students can utilize ChatGPT to experiment with different artistic techniques, find inspiration for their creations, or even discuss art history and philosophy. By actively engaging with AI and incorporating its feedback into their creative processes, students improve their

capacity to think outside the box, discover new possibilities, and express themselves artistically.

Collaborative problem-solving, ethical issue talks, and cross-disciplinary initiatives are all examples of innovative ways to use interactive language tools to improve cognitive skills. Collaborative problem-solving exercises might involve students working in small groups to tackle complicated problems utilizing ChatGPT (Keengwe, 2023; Meron & Araci, 2023). This strategy promotes cooperation, communication, and critical thinking abilities by having students participate in debates, offer ideas, and jointly analyze the AI's responses.

Interactive language tools can help facilitate ethical issue talks by presenting students with hypothetical scenarios and engaging them in discussions about the ethical consequences and decision-making processes. This practice increases cognitive skills like ethical awareness, empathy, and critical thinking (Rehman *et al.*, 2023). Furthermore, cross-disciplinary projects help students to apply knowledge and skills from multiple subjects (Huber & Morreale, 2023). For example, students can use ChatGPT to conduct research and create a presentation on the impact of historical events on literature, combining historical and literary knowledge. This technique encourages cognitive flexibility by allowing students to establish connections between disciplines and build a comprehensive comprehension of the subject matter.

Furthermore, interactive language tools help students improve their cognitive skills. These technologies encourage cognitive growth through critical thinking, problem solving, and creative engagement. Educators can use interactive language tools to help students improve their cognitive skills by introducing new ideas like collaborative problem-solving, ethical dilemma debates, and cross-disciplinary projects. These approaches teach students to think critically, solve issues creatively, and build the cognitive skills required for success in a variety of academic fields and real-world settings.

Deepening Literacy Skills

Regular use of ChatGPT can dramatically improve learners' literacy skills. Students must use advanced reading skills to analyze and interpret the AI's responses because they are dealing with complex and sophisticated language (Alharbi, 2023; Lee *et al.*, 2023). By diving deeper into the AI's responses, students are exposed to a wide range of texts and topics, growing their vocabulary, boosting reading comprehension, and honing their writing skills.

Students are exposed to a wide range of texts through their interactions with ChatGPT, which cover a variety of topics and offer information in a variety of formats (Adeshola & Adepoju, 2023). For example, an astronomy student can interact with the AI to learn about the most recent findings, read scientific articles, and discuss complex space exploration concepts. This exposure to many types of texts allows students to acquire variety in reading and widen their knowledge base.

Furthermore, the AI's responses frequently use sophisticated vocabulary and complicated sentence structures, giving students opportunity to improve their language skills (Zhai, 2023; Anis, 2023). For example, when discussing a historical event, students may come across vocabulary unique to that era or academic jargon related with historical study. Students can acquire and incorporate these concepts into their own vocabulary by being exposed to them repeatedly and understanding their context, allowing them to express themselves more accurately and effectively.

In addition to increasing vocabulary, daily contact with ChatGPT increases students' reading comprehension. The AI's solutions frequently require students to understand and interpret complex material (de Winter, 2023; Rahman & Watanobe, 2023). For example, when discussing a literary work, students may seek clarity on underlying themes or character motives, causing them to critically scrutinize the text and participate in critical thinking. Students improve their capacity to grasp and interpret complicated texts by actively engaging with the AI's responses, extracting crucial details, and identifying main themes.

Furthermore, the AI's comments are demanding, encouraging students to explore deeper into their reading materials (Chen *et al.*, 2023). Students are encouraged to perform independent study and participate in meaningful analysis while seeking clarification or exploring related subjects. A student researching climate change, for example, can use ChatGPT to investigate various scientific studies, read scholarly publications, and participate in debates about the consequences and potential solutions. This procedure not only enhances their comprehension of the material, but it also develops their analytical and interpretive skills.

Virtual book clubs, writing mentorship, and multilingual language learning are all examples of innovative ways to improve literacy abilities using interactive language tools like ChatGPT. Virtual book clubs allow students to participate in conversations about literary works utilizing ChatGPT as a resource. They can investigate character development, plot complexities, and thematic themes, promoting close reading, critical thinking, and collaborative learning (Javaid *et al.*, 2023; Alshahrani, 2023). Writing mentorship with ChatGPT can help students improve their writing skills. Students can communicate with the AI to get comments and suggestions on sentence construction, word choice, and general coherence. Students who receive individualized coaching and guidance can improve their writing skills, express themselves more effectively, and establish their own distinct writing style.

Furthermore, interactive language technologies such as ChatGPT can be used in language learning environments to improve language proficiency. Students can have talks with the AI to develop vocabulary, sentence structure, and cultural awareness. For example, a student learning French can utilize ChatGPT to engage in French discussions, practice grammar and vocabulary, and learn about French culture. This comprehensive and engaging language learning experience enables students to improve their language abilities and have a better understanding of diverse cultures.

Furthermore, regular involvement with ChatGPT strengthens students' literacy skills by testing their reading abilities, expanding their vocabulary, enhancing reading comprehension, and encouraging critical thinking. Students' reading abilities and knowledge base grow when they are exposed to a variety of texts and themes. The AI's superior language usage improves students' vocabulary, allowing for more precise and effective expression. Students' reading comprehension and critical thinking skills increase as they interact with the AI's responses. Innovative concepts like virtual book clubs, writing mentorship, and multilingual language learning improve literacy abilities by encouraging close reading, individualized support, and cultural understanding. Through these approaches, interactive language technologies such as ChatGPT become excellent resources for helping students develop literacy skills.

The Integration of Interactive Language Tools in Classroom Practice

Incorporating interactive language technologies such as ChatGPT into classroom practice necessitates careful thinking and execution. Educators should schedule particular time within the curriculum for students to interact with the technology, ensuring that it aligns with the targeted learning outcomes (Kostka & Toncelli, 2023). Furthermore, educators can create activities that allow students to collaborate and discuss their encounters with ChatGPT, resulting in a friendly and inclusive learning environment.

The use of interactive language tools provides several benefits to learners. It gives them an additional resource to help them develop their language abilities and improve their literacy. ChatGPT can serve as a virtual tutor or conversation companion for students, providing tailored guidance and feedback (Javaid *et al.*, 2023; Atlas, 2023). Interactions with the AI allow students to practice reading, writing, and speaking skills, building confidence and fluency in the language they are studying. This tool is especially useful for targeted training, as it allows students to receive quick feedback and coaching suited to their specific requirements.

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There are numerous innovative approaches to incorporating interactive language technologies into classroom practice. Educators can assign inquiry-based assignments using ChatGPT as a research tool (Cooper, 2023). Students can collaborate to generate research questions, examine issues based on AI responses, and present their findings to the class. This strategy encourages collaborative learning, information literacy, and critical thinking.

Imran & Almusharraf (2023) recommend using ChatGPT for virtual writing sessions. They can send their written work to the AI and receive rapid comments on sentence structure, grammar, and coherence. Students can also discuss their writing with peers, offering constructive critique and suggestions for development. This collaborative method improves students' writing abilities and helps them to critically evaluate and update their work.

Educators can use interactive language technologies to promote cross-cultural exchanges (McVeigh, 2023). Students from other regions or nations can communicate via ChatGPT to learn about one another's cultures, traditions, and languages. This promotes multicultural understanding, empathy, and communication skills, allowing students to explore and appreciate a variety of perspectives.

It is vital to highlight that these innovative concepts should be customized and modified to meet the unique demands and environment of each classroom. Educators can personalize exercises to their students' ages, competence levels, and subject matter. Furthermore, incorporating interactive language technologies such as ChatGPT into classroom instruction necessitates careful planning and execution. Educators provide opportunities for students to engage with the tool and improve their reading abilities by setting aside specified time. The integration should be consistent with the curriculum goals, ensuring that the tool supports the

targeted learning results. Innovative initiatives, such as collaborative inquiry projects, virtual writing workshops, and cross-cultural exchanges, present students with engaging and relevant learning experiences. These approaches transform interactive language technologies into important educational resources that promote collaboration, critical thinking, and intercultural understanding.

ChatGPT's Technical Implementation to Enhance Students' Cognitive and Literacy Skills through Interactive Learning

Students can use ChatGPT as a valuable tool to investigate cognitive and literacy development. Students can improve their critical thinking skills by having interactive conversations with ChatGPT. They may investigate other points of view, understand difficult concepts, and participate in stimulating discussions. ChatGPT becomes a virtual friend for learners, testing their reasoning skills and instilling a habit of logical and analytical thinking.

In terms of reading skills, ChatGPT allows learners to develop their vocabulary and improve their language skills. Students can discover new words, learn their meanings, and experience their context-appropriate use through dynamic interactions. ChatGPT can also provide language ideas and assist students in improving their sentence structure, grammar, and writing style. Students improve their written communication skills by obtaining personalized criticism and training.

Reading comprehension is another area where ChatGPT can make a huge difference. Students can interact with ChatGPT about tales, articles, and texts to improve their comprehension and interpretation. They can ask questions, get clarification, and discuss the main concepts and topics. ChatGPT can also encourage students to evaluate characters, identify literary methods, and draw parallels to their own experiences, so developing critical reading skills and a greater appreciation for literature.

ChatGPT's research capabilities help learners' cognitive and literacy development. With instruction, students can utilize ChatGPT to find accurate material, evaluate sources, and devise productive research plans. They can learn how to extract pertinent facts, summarize key points, and synthesize knowledge from many sources, thereby improving their information literacy skills. ChatGPT also promotes collaborative learning experiences. Students can collaborate using ChatGPT as a virtual team member, participating in group discussions, brainstorming sessions, and writing tasks. This improves communication, teamwork, and problem-solving ability.

The following are basic samples of questions that students could use to interact with ChatGPT:

- How can ChatGPT help me become a better thinker and problem solver?
- What cool things can ChatGPT do to help me learn new words and improve my language skills?
- Can ChatGPT make reading more fun and help me understand stories better?
- How can ChatGPT give me helpful tips to write better essays and stories?
- Can ChatGPT find interesting information for my school projects and teach me how to do research?
- What are some fun ways I can use ChatGPT to practice speaking and improve my communication skills?
- Can ChatGPT help me be more creative and tell awesome stories like a pro?

- How can ChatGPT make grammar and sentence structure easier for me to understand and use correctly?
- What challenges might I face when using ChatGPT, and how can I overcome them?
- How can ChatGPT make learning English more enjoyable and help me become fluent?
- Can ChatGPT be my study buddy and help me with different subjects? How?
- How can I be a responsible user of ChatGPT and use it in a fair and ethical way?
- Can you share some real-life examples of how other students have used ChatGPT to improve their skills?
- How can I keep track of my progress and see how much I've improved using ChatGPT?
- Can ChatGPT help me take better notes and summarize information more easily?
- How can I use ChatGPT to work on projects with my classmates and make teamwork more fun?
- Can ChatGPT teach me interesting facts and different perspectives on various topics?
- What are some fun and engaging ways to use ChatGPT in class to boost my learning?
- Can ChatGPT help me think critically and analyze things more deeply? How?
- How can ChatGPT support me in becoming a confident and skilled learner?

Furthermore, proper usage of ChatGPT allows students to think creatively and create their own distinctive voices. Students can foster their creativity by exploring numerous writing prompts and engaging in inventive conversations, broadening their horizons and adopting innovative techniques to expression. Students' use of ChatGPT enhances cognitive and literacy development by encouraging critical thinking, vocabulary expansion, increased writing skills, reading comprehension, advanced research abilities, collaborative learning experiences, and the growth of creativity. Students who adopt ChatGPT as a supportive learning partner go on a transformative journey to become proficient and knowledgeable.

CONCLUSION

Incorporating interactive tools like ChatGPT into K-12 teaching is a promising opportunity to integrate cognitive development and language learning. These tools, which are based on cognitive development and sociocultural learning theories, provide students with meaningful language experiences while also developing language competency and cognitive skills. The dynamic and interactive nature of these tools promotes psychomotor brain development by engaging learners in planning, controlling thoughts, and executing finger movements while using computers. As educators face the challenges of integrating cognitive and literacy abilities into foreign language training, interactive solutions such as ChatGPT can help promote language acquisition and cognitive growth in K-12 learners.

Future research in this area can investigate the long-term effects of interactive language tools on language competency, cognitive development, and academic success. In addition, studies might look into the function of teacher training and professional development programs in effectively integrating these tools in a variety of educational environments. Examining the various cultural and socioeconomic aspects influencing the uptake and impact of interactive technologies such as ChatGPT would also help us gain a better understanding of their usefulness. By doing rigorous research in these areas, educators and policymakers may

make educated judgments about incorporating interactive language tools into K-12 education, thereby improving language learning outcomes and cognitive development for students.

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