

How Can Artificial Intelligence Improve Children's English Reading Comprehension?

Xiao Xu, Jiangsu Normal University, China

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Abstract

The increasingly extensive application of artificial intelligence in various societal domains has a progressively profound impact on education reform. The proper use of AI can create a favorable English learning environment for students to promote English reading comprehension. This research investigates whether children can improve their English reading ability and enhance their interest in learning English with the help of AI. The participants of the research were 14 students from Grade Six in a primary school in Xuzhou. The duration of the research was six weeks. In the first week, students were given a TOEFL Primary Step 1 reading test and an English reading interest questionnaire. After the pre-test, teachers converted each student's reading score into a Lexile level and selected English reading picture books suitable for their Lexile level to teach in the next four weeks. From the second week to the fifth week, the teacher selected a reading lesson every week for AI-assisted teaching. Each class consisted of three parts: the teacher uses a multi-modal teaching method to teach picture books; students use an AI tool, Reading Coach, to read the picture books they have learned and choose new ones to read. Four weeks later, the 15 students took the TOEFL Primary Step2 test and the same questionnaire survey again. By comparing the average reading scores of the pre-test and post-test and analyzing the results of two survey questionnaires, we found that students' reading comprehension ability has improved, and students' interest in English learning has also been enhanced.

Keywords: artificial intelligence, English reading comprehension, learning interest, AI-assisted teaching, Lexile framework

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Introduction

English reading comprehension occupies a core position in primary school English teaching. It is not only the embodiment of comprehensive use of language knowledge, but also an important way to cultivate students' thinking ability and cross-cultural communication awareness. With the rapid development of artificial intelligence technology, its penetration in the field of education has brought new opportunities and challenges for primary school English reading teaching. How to effectively use artificial intelligence to improve primary school children's English reading comprehension has become an urgent research topic. I am a first-year postgraduate student majoring in primary education. I have a very strong interest in integrating artificial intelligence into primary school English teaching, so I chose this topic for research.

Theoretical Framework

Theory of Constructivism

Constructivism believes that learning is a process in which learners take the initiative to process new information and construct the meaning of knowledge (assimilation and adaptation) based on original knowledge experience and in a certain social and cultural environment. In terms of artificial intelligence helping primary school children to improve their English reading ability, based on the constructivist learning theory, artificial intelligence can provide children with rich reading materials and multiple interactive situations (Piaget, 1977). For example, intelligent reading software can push personalized English stories, articles, and other reading materials according to children's reading level and interest preferences, which becomes the basic information source for children to construct an English knowledge system. At the same time, English reading situations created by virtual reality or augmented reality technology, such as virtual English library and story scene reproduction, enable children to deepen their understanding and construction of reading content in interaction with the environment. Children no longer passively accept knowledge, but actively explore and discover in the interaction process with the resources provided by artificial intelligence, and constantly adjust their cognitive structure to improve their English reading ability. As Piaget emphasized, children develop cognition in interactions with their environment, and AI provides a broader, more personalized space for such interactions (Vygotsky, 1978).

Theory of Multiple Intelligences

Gardner's multiple intelligence theory proposes that human beings have linguistic intelligence, logic-mathematical intelligence, spatial intelligence, body-movement intelligence, musical intelligence, interpersonal intelligence, introspective intelligence, natural observation intelligence, and other intelligences. In primary school English reading teaching, artificial intelligence can fully tap and develop children's various intelligences to improve reading ability (Gardner, 1983). For example, intelligent speech recognition technology can assist children in English reading training, in the process of exercising children's language intelligence, at the same time, software feedback to children reading, such as pronunciation correction, intonation evaluation, etc., help children to develop introspective intelligence, so that they can realize their shortcomings and improve. Some interactive artificial intelligence reading platforms, such as role-playing and group cooperative reading games, involve the cultivation of interpersonal intelligence, and children can better understand the connotation and meaning of reading texts in interaction with peers or virtual characters. In addition, the use of artificial intelligence reading tools rich in multimedia resources, such as animation, video, and

other forms to display reading content, can stimulate children's visual-spatial intelligence, help them more intuitively build an understanding framework of English reading content, to improve English reading ability in multiple dimensions (Gardner, 2011).

The Importance of Primary School Children's English Reading Comprehension Ability

In today's era of globalization, English has become a universal language and has gradually become one of the core subjects in the education system of various countries. For primary school children, English reading comprehension is not only the basis of learning English well, but also the key to their future academic development. With the rapid development of information technology, English has become not only a tool for daily communication but also a necessary means to acquire knowledge, participate in global cultural exchanges, and develop critical thinking. Therefore, it is of profound educational and social significance to cultivate children's English reading comprehension ability.

First of all, English reading comprehension is the core of language learning. For primary school students, English reading comprehension is not only the mastery of vocabulary and grammar, but also the accurate understanding and analysis of the topic of the article, the meaning of the sentence, and the author's point of view. The cultivation of this ability helps students to expand their vocabulary and enhance their language sense, thus laying a foundation for their future English writing and oral communication abilities. Reading comprehension is the most basic and key part of language learning, which directly affects students' English mastery and application ability (Lalić & Dubravac, 2021).

Secondly, English reading comprehension is conducive to the improvement of comprehensive quality. Primary school is a critical period for the development of children's cognitive and thinking abilities. Through reading, students can not only increase their knowledge but also exercise their analytical, reasoning, and critical thinking skills. For example, when reading an English story, students should not only understand the literal meaning but also be able to infer the motives of the characters, the development of the plot, and the deep meaning behind it. The cultivation of this ability helps students develop the habit of independent thinking and enhances their ability to solve problems.

In addition, English reading comprehension is crucial to the improvement of academic performance. In every subject in elementary school, reading and comprehension skills are fundamental to success. Especially in interdisciplinary learning, students need to acquire information from other disciplines through English reading and knowledge transfer. Therefore, if students have a good grasp of English reading comprehension skills, they will be able to cope with various learning tasks and challenges more easily. For example, the English textbooks or materials used in science, history, and other courses require students to have a certain English reading comprehension ability to fully understand and absorb the knowledge (Denton et al., 2022).

Furthermore, the improvement of English reading comprehension helps to cultivate cross-cultural communication ability. In the context of globalization, English, as the main tool of international communication, plays an increasingly important role. Being able to understand and appreciate English reading materials not only helps students to be exposed to cultures and ideas from around the world, but also fosters their global perspective. By reading works from different countries and cultural backgrounds, students can broaden their minds and enhance

their understanding and respect for multiculturalism, thus preparing them for future cross-cultural exchanges and international cooperation.

To sum up, the cultivation of primary school children's English reading comprehension ability has important academic, cognitive, and social significance. It is not only a basic skill for children to master English, but also a key factor to promote all-around development. How to effectively improve children's English reading comprehension has become an important problem to be solved urgently in the field of education. Through advanced educational technology and innovative teaching methods, we can provide children with a more personalized, interactive, and fun learning experience to help them thrive in the world of reading in English.

The Application of Artificial Intelligence in Primary School English Reading Teaching

In China, there are more and more artificial intelligence platforms to assist teachers in teaching. For example, Yike.com can provide rich picture book reading materials for primary school English reading teaching, accurately evaluate students' reading accuracy and fluency, etc., and develop personalized learning paths and plans based on students' learning data. The "Homework Together" platform can stimulate students' interest in the form of gamified homework, and its standard pronunciation error correction system can point out pronunciation errors in time, help improve oral English ability, and reduce the burden of homework correction. Qingrui Education can be used as an anthropomorphic interactive language training platform to correct pronunciation in students' imitation reading training. Its scoring system adopts brain-like cognitive calculation to provide clear standards for pronunciation evaluation.

These platforms can provide personalized learning support for students. By analyzing students' learning data, they can develop personalized reading learning paths, recommend resources, and give feedback guidance, such as pushing suitable reading materials according to students' vocabulary and reading ability. It can also provide intelligent interaction and feedback, with the help of speech recognition, intelligent question and answer, and other technologies to interact with students, timely and accurate feedback, such as the system automatically points out pronunciation errors after students read and correct. Some are more capable of creating situations, using virtual reality and augmented reality technology to create realistic English reading situations, such as allowing students to experience the story scenes immersive way and enhance the depth of understanding.

However, the application of artificial intelligence to children's English reading also faces problems and challenges. For example, there are some technical limitations, some tools have inaccurate speech recognition, situation creation is not real enough, and other problems, affecting the user experience and student experience. Secondly, some teachers lack knowledge and skills training related to artificial intelligence, which makes it difficult to give full play to its advantages, and they face new challenges in teaching design and classroom management. In addition, there may be data privacy leakage and security risks. The collection, storage, and use of students' learning data have privacy disclosure risks, and protection measures need to be strengthened. Finally, the issue of educational equity may arise. There is a gap between schools in economically developed areas and remote areas in the equipping and use of artificial intelligence educational tools, which may lead to the uneven distribution of educational resources.

Introduction to Microsoft Reading Coach

Artificial intelligence covers many advanced technical elements, such as new intelligent algorithms and big data. By introducing artificial intelligence into primary school English reading teaching, teachers create teaching situations around English reading teaching content based on a correct understanding of artificial intelligence technology, and encourage students to devote themselves to English reading learning. Microsoft Reading Coach is a generative AI tool from Microsoft for student groups designed to help learners improve their reading skills through personalized and engaging exercises. Reading Coach has the following features:

The first is its ability to provide personalized Reading exercises. The Reading Coach sets training tasks based on the user's reading questions, provides immediate feedback on pronunciation and fluency, and provides fluency coaching at the end of the chapter for words that the user finds challenging. The second is the ability to create AI stories, where users can freely choose characters, Settings, and reading levels to create their own AI stories, which are reviewed by Microsoft's Responsible AI guidelines and can be read in an "immersive reader." Third, a Reading coach can also provide a variety of reading modes, including creating stories, reading from libraries, and adding their content, to meet different learning needs. Finally, it can also provide learning progress tracking, so that teachers can understand the progress of students' learning to understand the improvement of students' reading ability.

In my opinion, using Microsoft Reading Coach to help children improve their English reading ability is of great significance in many aspects. First of all, it can provide students with a personalized learning experience. It can provide customized reading exercises according to children's reading level and learning situation, automatically detect and generate supplementary exercises for children's unfamiliar words, and create personalized reading trips tailored to children's needs according to their preferences for the content of story chapters. So it can better meet the learning needs of different children and improve learning efficiency.

Secondly, it can also provide immediate feedback and guidance for children in pronunciation and fluency, after reading a paragraph or chapter, can quickly point out the most difficult words, and guide them step by step how to break down the words by syllables, read each syllable clearly, help children timely detect and correct reading problems. Effectively improve the accuracy and fluency of reading.

Thirdly, it can stimulate students' interest in English learning to a certain extent. By allowing children to freely choose the characters and scenes in the story and determine the development direction of the story chapters, they can fully participate in the reading process and seem to become the creator of the story, which greatly enhances the interest and attraction of reading, thus stimulating children's interest and enthusiasm in English reading. Get them more engaged in learning.

Fourthly, I think it can enhance students' confidence in English learning. When children make progress in the reading process, such as completing chapter reading, correctly reading difficult words, etc., the app will reward them with badges focused on effort and unlock new characters and scenarios for the next story. This reward mechanism can make children feel recognized and affirmed for their efforts, which can increase their self-confidence and make them more motivated to continue reading and learning.

Fifthly, it can cultivate students' self-learning ability. In the process of using Microsoft Reading Coach, children can choose the learning content and determine their learning progress independently, gradually learn self-management and self-supervision, and cultivate the ability of independent thinking and problem-solving, which lays a good foundation for future learning and development.

Finally, Reading Coach can also assist teachers in teaching. Through this tool, teachers can understand children's learning progress and reading ability improvement, to make more targeted teaching plans and guidance strategies, provide more accurate education support for each child, and improve teaching effects.

Research Design

The purpose of this study was to test whether children's English reading comprehension improved with the assistance of artificial intelligence. The subjects were students from two classes of Grade Three in a primary school in Xuzhou city. The specific study design was to divide the two classes into an experimental group and a control group. At the beginning of the semester, the students of the two classes were given a TOEFL Primary Step 1 reading test, which consisted of 30 minutes of reading. The average scores of the two classes were compared after the test was completed. The pre-test also includes an English reading interest questionnaire to investigate students' attitudes and interest in English reading. According to each student's TOEFL Reading score, the teacher can convert the reading score into Lexile level, select English reading picture books suitable for their Lexile level, and input the picture book reading materials into the Reading Coach in advance. After the semester begins, the teachers in the experimental group will select a reading lesson every week. In the first round, students are asked to spend 10 to 15 minutes reading picture book reading materials suitable for their situation with Microsoft Reading Coach. The reading Coach can provide reading accuracy according to students' reading situation, and present students' misreading or unfamiliar words for repeated practice. The second task is to let students read freely, and students can create their reading materials. One function of the Reading Coach is to freely choose roles, scenes, and reading levels, create exclusive artificial intelligence stories, and read them. In this process, teachers need to make inspections and help students answer questions. The teachers in the control group taught normally and did not use artificial intelligence tools to assist the teaching. After one semester, we conducted the TOEFL Primary Reading comprehension test and post-test of the English reading interest questionnaire for the two classes again, and compared the average scores of the two classes. It is expected that the average scores of the experimental group will be higher than those of the control group, and the reading comprehension ability of the students in the experimental group will have been significantly improved, and the interest in English reading of the students in the experimental group will also have been significantly improved.

Prospects of Using Reading Coach to Improve Children's English Reading Comprehension

In the future, Microsoft Reading Coach will be deeply integrated into the English teaching scene and become the core tool for teachers to improve children's reading comprehension. With its advanced artificial intelligence technology, it can conduct real-time analysis of each child's reading behavior, generate detailed reports from multiple dimensions such as reading speed, comprehension accuracy and vocabulary mastery, so that teachers can accurately grasp the learning situation and formulate highly personalized teaching strategies.

In the classroom teaching, it will achieve seamless docking with the teaching process. Teachers can use their extensive library to easily conduct thematic reading lessons, such as natural science topics, and quickly select multiple articles suitable for children of different levels. The reading coach can provide immediate pronunciation and intonation correction when the children read, initiate interactive discussion on the content of the article after reading, guide the children to actively participate in the article with virtual characters, cultivate critical thinking and oral expression skills, and make the class full of vitality and depth.

For after-school learning, the Microsoft Reading coach will build a solid bridge for co-education. As children continue their reading journey at home, the software recommends extended reading material based on what they have learned in class and intelligently tracks their progress. Parents can intuitively understand their children's learning trajectory and receive professional guidance and suggestions through the supporting parent application, to better accompany and encourage their children to read and realize the organic combination of home-school education.

In the future, Microsoft Reading Coach is expected to integrate with emerging technologies. For example, with the help of virtual reality (VR) technology, create an immersive reading environment for children, so that they seem to be in the story scene, greatly enhancing the reading experience and memory effect. This innovative tool will continue to promote the transformation of children's English reading teaching, open a door to a broad world of knowledge for children, help them steadily move forward on the road of English learning, and lay a solid foundation for future academic and life development.

Conclusion

This study demonstrates the significant potential of artificial intelligence (AI), particularly tools like Microsoft Reading Coach, in enhancing primary school children's English reading comprehension and fostering their interest in English learning. By integrating AI into a six-week intervention program, students in the experimental group exhibited measurable improvements in reading scores on standardized tests (TOEFL Primary) and reported increased engagement and motivation through post-intervention surveys. Key findings highlight the effectiveness of AI in providing personalized learning experiences, immediate feedback, and interactive, gamified content that aligns with constructivist principles and Gardner's theory of multiple intelligences.

The success of AI-assisted teaching lies in its ability to adapt to individual learners' Lexile levels, offer dynamic error correction (e.g., pronunciation guidance), and empower students to co-create stories, thereby enhancing autonomy and creativity. Furthermore, AI tools like Reading Coach alleviate teachers' burdens by generating data-driven insights for targeted instruction, bridging classroom learning with at-home practice, and fostering home-school collaboration.

However, challenges remain, including technical limitations (e.g., speech recognition accuracy), uneven access to AI resources across regions, and the need for teacher training to maximize AI's pedagogical value. Future research should expand sample sizes, extend intervention durations, and explore integrations with emerging technologies like VR to create immersive reading environments. Policymakers and educators must address equity gaps to ensure all students benefit from AI-driven innovations.

In conclusion, AI represents a transformative force in primary English education. By leveraging its strengths while mitigating limitations, stakeholders can cultivate a generation of confident, skilled, and globally minded young readers prepared for the demands of a rapidly evolving world.

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Contact email: 1418384304@qq.com