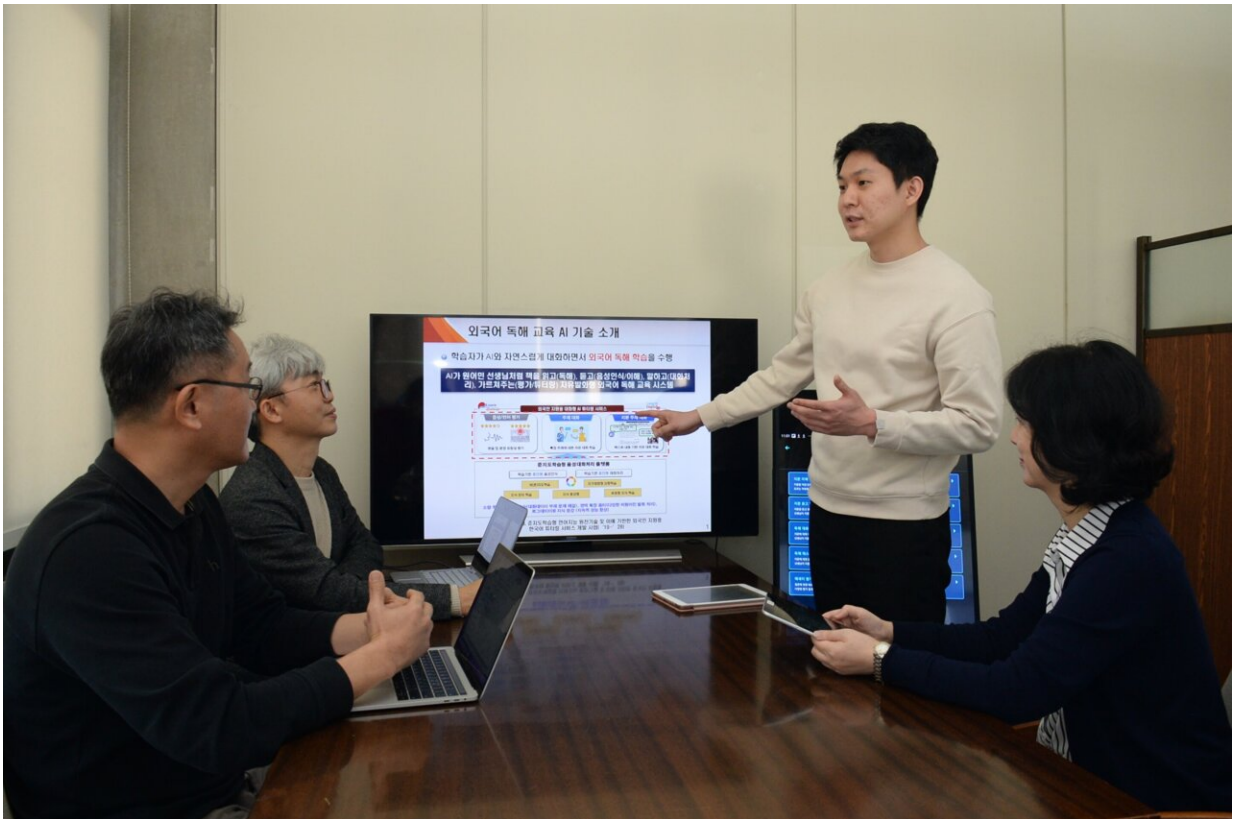# An AI tutor who teaches foreign language reading

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ETRI researchers demonstrate the reading comprehension education conversation technology of the reading comprehension education AI system. Credit: Electronics and Telecommunications Research Institute(ETRI)

The Electronics and Telecommunications Research Institute (ETRI) has developed a reading comprehension education AI technology that allows

you to learn foreign language listening, speaking, and reading by talking to an artificial intelligence (AI) tutor. It is expected to be of great help in the spread of AI-based language education services.

The Electronics and Telecommunications Research Institute (ETRI) introduced a reading comprehension AI tutor, an artificial intelligence technology for reading education, that introduced deep learning-based dialog processing technology to reading comprehension education for the first time in the world. Through this, it is expected that Koreans will be able to learn English and foreigners will be able to learn Korean more easily and effectively.

The reading comprehension AI tutor technology developed by the research team helps learners learn English reading and listening based on textbooks, just like private teachers. It also asks questions about the contents of the textbook, conducts dialogs related to the contents read, and evaluates learners' responses. Through this, it helps learners to see the effect of studying with private teachers. In addition, learners will be able to receive English reading comprehension education, which was only possible through face-to-face education, through non-face-to-face at home or outside.

ETRI has already developed AI-based conversational foreign language education technology and provided services. EBS's AI PengTalk is applied with ETRI's English speech recognition, pronunciation evaluation, and free conversation processing technology. This service is used as a public education English speaking learning service for elementary schools nationwide.

In addition, the same technology is applied to King Sejong Institute Foundation's "King Sejong Institute AI Korean Tutor" to provide opportunities to learn Korean to students who lack opportunities to communicate with Koreans.

This picture demonstrates a reading comprehension AI tutor who reads and understands the text developed by ETRI, communicates with learners, and teaches. Credit: Electronics and Telecommunications Research Institute(ETRI)

Existing conversational foreign language education technology supports learning foreign languages by conversing with native speakers in English or Korean by conversing with AI in various contextual topics. Unlike this, the research team improved the education method to teach and evaluate foreign language books while reading and talking together.

AI technology for reading comprehension education is applied with non-native speaker speech recognition technology, pronunciation evaluation technology, machine translation technology, and dialog processing

technology for reading education developed by ETRI, enabling:

- listening and reading
- text understanding
- reading conversation service

In text listening and reading, when the learner listens to and reads the text read by the reading AI tutor, the learner's pronunciation is evaluated and feedback on the pronunciation is provided. In text comprehension, if the learner selects a part that he or she does not understand well or is curious about while reading the text, the reading AI tutor notifies the meaning in the native language.

In addition, in the reading conversation, the reading comprehension AI tutor asks questions about the text and when the user responds, the accuracy of the meaning of the user's response is evaluated and a hint for the correct answer is provided.

Lee Yoon-geun, Director of ETRI Artificial Intelligence Research Center, said, "I hope that AI technology for reading will be of great help to native and foreign learners who want to study reading with native English teachers."

Currently, the research team is also developing a technology for automatic evaluation of essays written by learners regarding reading content. It will also continue its follow-up research to provide AI tutor services that help with reading, listening, speaking, as well as writing.

During the project, the researchers accomplished the following: 35 patents, 41 published papers, 21 technology transfers, and the adoption of 2 international standards, among others.

The study is published in the journal *IEEE Access*.

More information: Jin-Xia Huang et al, DIRECT: Toward Dialogue-Based Reading Comprehension Tutoring, *IEEE Access* (2022). [DOI: 10.1109/ACCESS.2022.3233224](#)

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