

EYE-TRACKING ANALYSIS OF THE EDUCATIONAL EFFECT OF REFUTATION TEXT IN READING SCIENCE TEXTS: CASE OF CELESTIAL MOVEMENTS AND SEASONAL CHANGES

Hideto Hagiwara^a, Shuji Ukon^b, and Fumiko Okiharu^c

Presenting Author: Hideto Hagiwara (1722508@ed.tus.ac.jp)

^aDep of Math. and Sci. Edu., Graduate School of Science, Tokyo University of Science, Tokyo 162-8601, Japan

^bFaculty Of Science and Engineering, Tokyo City University, Tokyo 192-0397, Japan

^cCenter for Teacher Education, Tokyo University of Science, Chiba 278-8510, Japan

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Refutation text is focusing on learner's naive concept in order to refute it and forming scientific concept. It has been reported that reading refutation text is more effective than reading expository text in changing naive concepts of learners. According to Broughton et al. (2010), those who read refutation text spent less time reading than those who read expository text and made fewer errors on the post-test. This may suggest the cognitive efficiency in reading refutation text. In previous studies, the educational effects of using expository text or refutation text were examined by comparing the percentage of correct answers to pre-test, post-test etc., to verify the effects. It has already been reported how learners' gaze allocation to sentences differs between expository text and refutation text (Ariasi et al., 2017). However, so far, few eye-tracking researches have been conducted.

In this study, we used an eye-tracking device to conduct a qualitative investigation on how the eye movements and time differed between the group who read the refutation text and the group who read the expository text. The target of the survey is about 20 Japanese undergraduate and graduate students, and the survey period is scheduled for June to August 2022. As for the research questions, we created refutation text and expository text on the subjects of celestial movements and seasonal changes, referring to the research questions of previous research by Broughton et al. (2010). The survey method is as follows. (1) A paper-based pre-test was conducted. (2) Measure eye movements of subjects who read survey questions presented on a monitor. At this time, one group was shown only the refutation text, and the other group was shown only the expository text. In addition, to both groups, another same scientific text was displayed on the monitor in order to measure the personal reading speed. (3) A paper-based post-test was conducted. (4) After the measurement, we conducted a semi-structured interview, including to see which part of the sentences the learner paid attention to, and recorded the audio.

At present, as a reproduction of the results of previous research, the group that read the refutation text spent less time reading the text, and when comparing the rate of increase in scores between the pre-test and the post-test, the group that read the refutation text had a tendency for the score to increase significantly. The analysis of the data obtained by eye tracking will be presented at the conference.

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