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Study Years: 2013-2014

Title: Reading an analogy can cause the illusion of comprehension.

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Strand of work: Basic Studies

Submitted Abstract

This study explored students' ability to evaluate their learning from a multimedia inquiry unit about the causes of global climate change. Participants were 90 sixth grade students from four science classrooms. Students were provided with a text describing the causes of climate change as well as graphs showing average global temperature changes. Half of the students also received an analogy to help support their understanding of the topic. Results indicated that overall students were over-confident about how much they learned and how well they understood the topic. Further, the presence of an analogy led to higher levels of over-confidence. Results also indicated that students with better graph interpretation skills were less over-confident even when the analogy was present. These results suggest that the presence of graphs and analogies can negatively affect students' abilities to accurately judge their own level of understanding and may lead to an illusion of comprehension.

Purpose and Questions Investigated, Assessments or Tools developed

We created a simplified version of a climate change inquiry activity for sixth graders in order to investigate whether single or multiple document presentation, or the presence of an analogy, might support better comprehension for younger students.

Research Context or Methodology

Setting and Participants: 90 sixth graders from 4 science classes at an urban public school serving primarily Hispanic students.

Research Design, Data Collection, and Analysis: As part of their science classes, students were asked to complete a two-day inquiry on "How and why are recent patterns in global temperatures different from what has been observed in the past?" The presentation of the texts as single vs. multiple documents, and the presence of an analogy, were manipulated. Text annotations, student essays, performance on comprehension tests, measures of spatial ability, graph interpretation skills, and judgments of understanding were analyzed.

General statement of findings

Results indicated that overall students were over-confident about how much they learned from the unit. The presentation of texts and graphics as single versus multiple documents did not affect comprehension, nor did the presence of an analogy, but the analogy led to higher levels of over-confidence. However, students with better graph comprehension skills were found to show less over-confidence.

Implications

The results suggest that training students how to use graphics and analogies when engaging in multiple document inquiry tasks may increase their ability to judge their learning more accurately. Accurate monitoring is essential for effective self-regulated learning, especially when students engage in inquiry tasks where they need to decide whether and when to re-read documents, and when to engage in more elaborative processing of material in order to achieve understanding of the topic of inquiry (Wiley, Ash, Sanchez & Jaeger, 2011).

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