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The Usefulness of Bridging Inferences and Elaboration Strategies in Comprehension

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Abstract

Reading is an essential part of everyday life. This is especially true in school and research situations. Within reading, there has been a noticed deficit in the ability to comprehend science texts (McNamara, 2017). The self-explanation and reading strategy training (SERT) is a training program that provides strategies to help with the comprehension of these texts (McNamara, 2017). SERT provides a description of self-explanation (put in own words) and six reading strategies (McNamara, 2017). These strategies are comprehension monitoring, paraphrasing, elaboration, logic/ common sense, predictions, and bridging (McNamara, 2017). All of these strategies assist in reading comprehension, and allow a reader to go beyond a text to make connections. We specifically focused on bridging and elaboration strategies that the readers presented as a way to comprehend the text in this study. We found that SERT increased the accuracy, apparent relationships and contribution averages for elaborations and increased accuracy for bridging.

Introduction

The goal of this study was to examine study strategies that influence comprehension, especially bridging inferences and elaborations. In the study, we examined variations of Self-Explanation Reading Training (SERT). SERT supports self-explanation and six reading strategies (McNamara, 2017). These strategies are comprehension monitoring, paraphrasing, elaboration, logic/common sense, predictions, and bridging inferences (McNamara, 2017). We examined whether SERT instructions provided in the form of process versus product instructions would better facilitate effective comprehension processes such as bridging inferences and elaborations.

Bridging Inferences

Bridging inferences are connections to previous information in a text to facilitate comprehension of the material (Graesser et al., 1994). Bridging inferences are associated with deeper comprehension goals (van den Broek et al., 2001) and facilitate building a stronger mental model through local and global textual connection (Graesser et al., 1994). One goal of this study is to see whether process versus product instructions influence the frequency and quality of bridging inferences generated.

Elaborations

Elaborations occur when readers connect current text to background knowledge (Bohn-Gettler & Rapp, 2014 and McCrudden & Schraw, 2006). This helps facilitate text understanding (McCrudden & Schraw, 2006) and problem-solving (Bohn-Gettler & Rapp, 2014), and aids a reader in going beyond the given information (McNamara & Magliano, 2009). In this study, we examined whether SERT increases elaborations when reading a text on evolution.

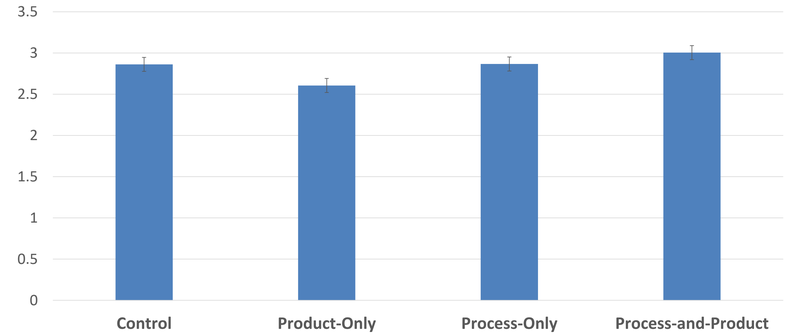
Hypothesis

SERT instructions will increase the use of effective comprehension strategies such as bridging inferences and elaborations. In addition to this, we expect to see the greatest level of effective comprehension strategies for readers receiving the process-and-product instructions.

Methods

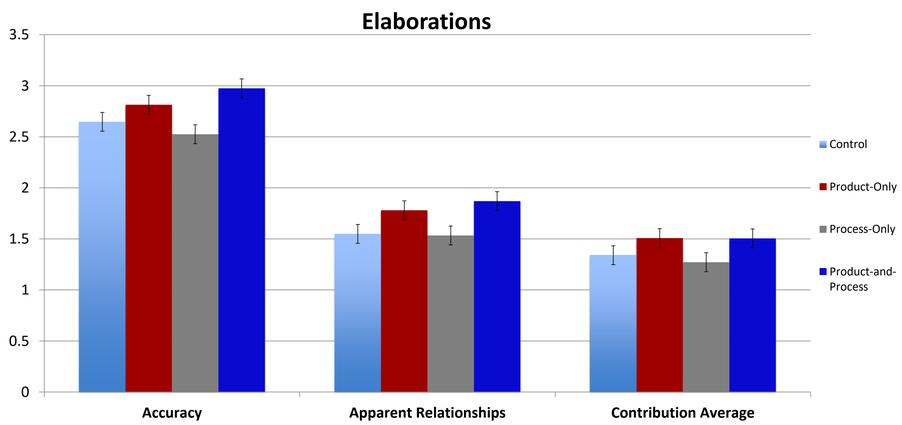
- 99 participants from undergraduate, Midwestern college
- Controlled for knowledge by using shortened version of the Conceptual Inventory of Natural Science test, CINS (Athanasiou & Mavrikaki, 2014)
- Participants were split into 4 instructional manipulations to practice a written think-aloud task:
  - Condition 1: control group; received no process of product instructions and wrote down anything that came to mind
  - Condition 2: process only group; performed a written think-aloud task using SERT
  - Condition 3: product-only group; informed that after reading they would be asked to explain the reasons why Piloses have skinny noses
  - Condition 4: process-product group; asked to think-aloud using SERT during reading and informed that after reading they would be asked to explain why Piloses have skinny noses
- Participants were given the text, "How the Piloses Evolved Skinny Noses" (Kelemen, 2017) and performed a written think aloud task as they read
- Think-aloud responses were coded by identifying elaboration and bridging inferences in each response.

Conclusion



Accuracy: $F(3, 58) = 3.39$, $p = .02$, $\eta^2 = .15$

When students were given process-and-product instructions before engaging in the science text, the accuracy of their bridging inferences was higher in comparison to the other conditions.



Accuracy: $F(3, 76) = 5.29$, $p = .002$, $\eta^2 = .17$

Apparent relationships: $F(3, 73) = 3.50$, $p = .02$, $\eta^2 = .13$

Contribution Average: $F(3, 76) = 1.14$, $p = .334$, $\eta^2 = .04$

When given process-only and process-and-product instructions before engaging with scientific text, participants' elaborations were more accurate, were more relevant (the "apparent relationships variable), contributed to a more global understanding of text, rather than a localized understanding (the "contribution average variable")

Results

Bridging

These results were significant for bridging accuracy meaning that when participants referred to context stated previously, they normally retained the information and presented it accurately in a later part of the study. This is important because it shows that the information they are learning is retained throughout the text.

Elaboration

Accuracy:

The accuracy was highest for process-and-product. Process-only was higher in comparison to product-only and control.

Apparent relationships:

A higher degree of elaboration in general for control- and product-only were seen in comparison to the process-only and process-and-product conditions. However, the quality of the elaborations was higher for the process-only and process-and-product conditions.

Contribution average :

Process-only and process-and-product had a higher contribution average then product-only and control.

This shows that SERT increases accuracy, apparent relationships and contribution averages for elaborations. Therefore, it can be suggested that SERT helps readers accurately store information to make better bridges and elaborations.

Discussion

The results suggest that Self-Explanation Reading Training can help readers accurately encode, store, and comprehend textual information by being better able to use bridging inferences and elaborations in the process-product condition as well as process condition. The results from this experiment suggest that readers should employ specific strategies during reading, and not focus on only the end product; for example, readers who engaged through the entire text attained better results than those who were only asked to respond at the very end of the text. Using bridging inferences and elaborations accurately will increase comprehension of texts. This is important because there continues to be a deficit in readers' abilities to understand scientific texts (McNamara, 2017). Instructors should emphasize process and product instructions during reading and not focus entirely on product instructions. This is important for readers to understand to their fullest ability the text they are reading. Instructions are not always implied, and many readers will interpret texts differently or without full detail when they don't know what information is the most important to grasp. These instructions have been correlated with increased comprehension, especially in bridging inferences and elaboration generation.

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