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Introduction to the Special Issue: Textbook Content and Organization—Why it Matters to Reading Comprehension in Elementary Grades?

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Abstract
Textbooks are a major source in supporting instruction about reading across the world. Classroom teachers and school rely on these documents to guide the scope and sequence of instruction and expect them to provide evidence-based instructional guidelines to promote comprehension. Theories of reading comprehension are synthesized to identify vocabulary, generation of main ideas, summarization, and extrapolating inferences as sound constructs that promote comprehension. A review of textbooks from multiple continents show that most do not address evidence-based practices. Until the textbooks that support instruction on comprehension change, little can be accomplished by other means.

Keyword Reading comprehension · Elementary grades · Textbooks · Evidence-based curriculum

1 Introduction

The impetus for this special issue originated during a European Literacy Network (ELN) COST Action Meeting held in Lyon, France in February 2018. The event focused on promoting the use of evidence-based reading interventions in member countries. The Framework for Accelerating the Strategic Comprehension of Text (FASCT) using the text structure strategy (Wijekumar et al. 2017), was presented to the participants from over 20 ELN member countries. One of the prominent themes discussed at the meeting was about the barriers to implementation of such interventions in complex school settings. Participants noted that understanding what was being taught in schools was necessary and important

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before any implementation may be considered. Textbooks are widely used by teachers in all countries and schools. Textbooks also present an excellent compiled artifact about what is recommended for instruction about reading comprehension in schools. Before investing significant time, effort, and resources into conducting classroom observations, interviews, and implementation plans, the ELN participants agreed to begin with the review of upper elementary grade textbooks to identify the types of passages presented, strategies used, and skills promoted in the books. This special issue presents the results from this effort and now includes broader representation from Austria, China, Croatia, Kenya, Macao, Malta, Portugal, and the U.S.

We begin with a synthesis of reading comprehension theories to showcase the significance of these reviews followed by highlights from the reviews. Finally, we present some recommendations about how these reviews can inform instruction, policy, and most importantly, positively impact student reading outcomes across the world.

2 Theories of Reading Comprehension and the Need for Translating Theory into Practice

Literacy, defined here as reading and writing, skills, are essential for every productive citizen of the world. Unfortunately, large numbers of children and adults struggle with reading and writing. According to the United Nations Educational, Scientific, and Cultural Organization Institute for Statistics [UNESCO UIS] 2017), six out of ten children and adolescents worldwide do not achieve the minimum proficiency level in reading especially in low-income and lower-middle-income countries. The componential model of reading (Aaron et al. 2008) suggested that textbooks are essential ecological components of reading instruction. Therefore, the quality of their design as to how they align with reading comprehension theories and evidence-based practices needs critical reviews. We analyzed textbooks as possible contributing causes for the continued rates of reading comprehension problems in schools across the world. As with many countries and school districts, textbooks reflect the core of a curriculum, and many teachers rely on reading textbooks to design reading and language arts instruction (Berkeley et al. 2016; Curdt-Christiansen 2020). Through textbook analysis, readers will find information about the scope and sequence of skills taught and the types of reading materials presented to students. The analysis showed that textbooks may be causing some of the challenges related to student reading comprehension outcomes (Joshi et al. 2009). Before presenting findings presented in the textbooks, we review the theoretical foundations of reading comprehension from which we can glean our foci for these analyses.

3 Prevalent Reading Theories from a Cohesive View

We began our review by using the Construction-Integration (C-I) model, one of the most influential reading comprehension models (Pearson and Cervetti 2015). Kintsch (1988, 2005) presented the C-I model to explain how readers consume information from texts at a surface, textbase, and situation models. At a surface model, students store phonological, semantic, and orthographic codes into short-term memory (Kintsch 1988, 2005). They then parse words, phrases, and sentences at a textbase model to comprehend their literal meaning (Kintsch 2005). While the first two models are deeply involved in the *construction*

of meanings, at a situation model, readers *integrate* prior knowledge and apply situational thinking to make predictions, resolve ambiguous or conflict information, and infer implicit messages (Schmalhofer et al. 2002). After reading, skillful readers will have a coherent mental representation of the text (Bogaerds-Hazenberg et al. 2020; Pearson and Cervetti 2015). Further, information irrelevant to such coherence will be suppressed in working memory, thus restricting inferencing surrounding the main idea (Kintsch and Van Dijk 1978; Schmalhofer et al. 2002).

The Reading Systems Framework model (Perfetti and Stafura 2014) explicitly discussed individual word knowledge's role in the C-I process. Specifically, the linguistic properties of individual words lay the foundations for both the construction and integration in the C-I model. In the example given by Perfetti and Stafura (2014, p. 27), to understand "the rain ruined her beautiful sweater," readers need to (1) retrieve the meaning of the content words "rain," "ruin," and "sweater," (2) process the morpho-syntactic characteristics to understand that the "rain" happened in the past (the *-ed* suffix attached to "ruin"), (3) integrate prior knowledge to make predictions (a rain might ruin a picnic), and 4) update the comprehension based on the context (the ruin did not ruin a picnic but ruined the sweater instead). Therefore, while the C-I model addresses the sentence and discourse level comprehension, the Reading Systems Framework explicated the role of individual words in the C-I process.

Compared to the C-I and the Reading Framework models, the Landscape Model (Van den Broek et al. 1999) explained reading comprehension more dynamically and reinforced that memory capacity is limited and needs to be used efficiently for comprehension. The metaphors *peaks* and *valleys* in a *landscape* referred to reactivated/updated ideas and decayed ideas, respectively (Van den Broek 2005; Van den Broek et al. 2005; Van den Broek et al. 1999). Additionally, as readers proceed through the text, some word- and sentence-level semantic memories will decay but will be *unintentionally* reactivated if they are restated in the text. However, skillful readers will *intentionally* reactivate existing semantic memory to enhance comprehension and also activate prior knowledge to make inferences and update semantic memory. Therefore, the differentiation of intentional and unintentional memory reactivation played an important role in explaining the differences between skillful and striving readers (Pearson and Cervetti 2015).

While the above theories explained the psychological process of reading comprehension and are highly influential, they have not explained where the *integration* process, which involves inference making and suppressing, should occur. The Text Structure Theory and its developments (Meyer 1975; Meyer and Poon 2001; Wijekumar et al. 2012; Wijekumar et al. 2020b) made these connections explicit. First, the Text Structure theory suggests that the ideas that are *relevant* and should be *intentionally reactivated* are those pertinent to the top-level structure (TLS) of a text (Meyer and Poon 2001). Therefore, information irrelevant to the TLS should be suppressed to allow a generation of the main idea (Meyer 1975). Therefore, the TLS guides the integration process to construct a coherent mental representation of a text. Then, instructional activities should guide the identification of TLS to allow the integration to occur under the current schemata.

On the other hand, Meyer and Poon (2001) identified problem and solution, cause and effect, and comparison as higher-order structures than description and sequence, as they prompt students to engage in constructing deeper level, more meaningful schemata than simply listing facts (description structure) or sequencing events (sequence structure). Wijekumar et al. (2020) suggested that a cause, problem, and solution structure is the fourth higher-order structure, as it differentiates problem and solution texts with and without a cause. Recent randomized controlled trials by Wijekumar and colleagues (e.g., Wijekumar

et al. 2012, 2014, 2017) provide accumulating evidence that applying these higher-order structure strategies in classrooms cause positive reading comprehension outcomes on standardized tests and researcher designed measures of main idea competence and TLS knowledge.

In this special issue, researchers from multiple countries across the world have focused on how reading comprehension is fostered in textbooks using the psychological lenses discussed above. As essential components of reading comprehension instruction, textbook passages activate different types of background knowledge and engage in different TLS processing. More importantly, the TLS of these texts, if instructed correctly, can inform the integration process to engage in generating cohesive main ideas and relevant inferences. As noted above, these constructs are theoretically grounded and empirically validated as effective strategies to improve reading comprehension. However, previous textbook analysis has not used a concrete theoretical framework in reading to examine the design quality of textbooks. Previous reviews focused more on the compilation of broader strategies such as the National Reading Panel recommendations (Joshi et al. 2009). Moreover, the previous textbook analysis focused on the U.S., while textbooks from other countries were seldom examined (e.g., Beerwinkle et al. 2018; Berkeley et al. 2016). The overarching focus of this special issue was on what reading comprehension was being recommended by the elementary grade textbooks in each country. Each paper adopted a reading comprehension theoretical framework to guide the coding of passages and/or post-reading activities, and the textbooks across six countries and five language systems were examined. Despite these differences, these papers raised common concerns regarding the fact that the words, passages, and post-reading activities have not been designed to foster reading comprehension. Therefore, although teachers are not discouraged from using textbooks, they must be aware of the textbook design issues and provide additional texts and activities to enhance reading comprehension skills, such as reading texts with higher-order structures, engage in main ideas and inference generation activities.

4 Findings from the International Review of Upper Elementary Grade Reading Textbooks

A review of the required fourth-grade reading textbooks from Mainland China presented by Zhang, Wijekumar, and Han (in this issue) shows that a new era has been ushered to promote reading and limiting the test preparation foci of previous generations of textbooks. Using the C-I model, the word-to-text integration model (Perfetti and Stafura 2014), and the Text Structure Theory (Meyer and Moon 2001) as the theoretical basis, the authors reviewed two Quality Education textbooks that are used across the country and present evidence that multiple text genres are presented. They also carefully reviewed the strategies used to promote comprehension and identified cause and effect as well as problem and solution as TLSs presented in the books. Unfortunately, the review showed that the students were not encouraged to focus on the higher-order thinking strategies such as skills that need integration of prior knowledge. More importantly, the authors identified the misalignment of the TLS of a text and the design of the post-reading activities. Specifically, the post-reading activities generally did not promote students to identify the problem and solution and cause and effect of a text. The authors concluded that the design of the Grade 4 textbooks used in Mainland China has been atheoretical and focused overly on recalling

and memorizing, and thus suggested to the textbook designers to incorporate prevalent reading comprehension theories into designing of textbooks.

In the work of Peti-Stantić, Keresteš, and Gnjidić (in this issue), five Croatian textbooks were reviewed examining text type, learning goals, and instructional strategies. Peti-Stantic et al., reports that most emphasis was placed on narrative texts at lower grade levels. Even though comprehension was the main goal, most questions focused on recalling factual information and rarely promoted inferencing. Higher-order thinking and text structures were not prevalent in any of the textbooks reviewed. Since post-reading questions, instructional strategies, and activities reflect the intended learning goals, they can influence teaching practices. The authors alerted that teachers unsatisfied with the approach presented in the textbook might not use the textbooks or use trivial worksheets from other sources. Both consequences can unintentionally create a lack of opportunities for their students to develop their higher-order reading skills.

The U.S. textbooks for grades 3, 4, and 5 from five major publishers were reviewed by Beerwinkle, Owens, and Hudson (in this issue). The purpose of their textbook analysis included: (a) examining the scope and sequence of comprehension strategies/skills in widely used reading textbooks, (b) exploring the coverage of comprehension strategies/skills across genre, and (c) comparing covered comprehension strategies/skills covered by National Reading Panel (NRP) recommendations. The review showed that textbooks used various text genres, including narrative and expository texts at all grade levels. Primary causes for concern included the lack of evidence-based instructional practices presented in the textbook (e.g., recommendations of the NRP) along with a lack of foundational skills and higher-order skills to promote reading comprehension in elementary grades. Exploring changes in the organization and content of textbooks may result in improved reading outcomes for students in elementary grades.

Eight textbooks from grades 4 and 6 in both Portuguese language and Science were reviewed by Cordeiro, Nunes, Castro, and Limpo (in this issue). Their coding focused on oral expression, grammar, reading comprehension, and text production for the Portuguese language textbooks and application of textual knowledge in the Science books. They coded the text types (e.g., narrative, poetry) as well as the types of reading comprehension questions in each textbook. Results of the review showed that fourth-grade textbooks focused mostly on recall in narrative texts, and sixth grade showed a higher focus on comprehension. Science textbooks, on the other hand, were focused on the content and recall of factual information with some open-ended responses.

A review of textbooks from the greater Hong Kong region focuses on word recognition and writing because the Chinese orthography requires recognizing and constructing a complex morphosyllabic system for communication. Hsiang, Graham, Wang, and Gong (in this issue), perused three reading textbooks from grades one to six for the number of simple and complex characters and word units taught and found that none of the books taught the recommended evidence-based number of characters and words for reading and writing. Further, their review showed that the textbooks focused on word recognition as the primary source for comprehension, and no logical higher-order thinking was encouraged or supported through the instruction.

A review of eight Austrian textbooks from fourth and sixth grades in German language and natural science focused on reading comprehension instruction and showed a similar pattern to other countries. The Austrian educational framework and objectives reported by Seifert (in this issue) showed a strong emphasis on comprehension using theoretically grounded approaches, including generation of main ideas, inferencing, and questioning. Seifert reviewed how many texts were read, learning goals, text types, and text structures in

the textbooks and found that all primarily used expository texts and rarely used text structures. The strategy instruction for comprehension was minimal in the language textbooks but not presented in the Natural Science textbooks.

Four Maltese language and two social studies textbooks were analyzed by Aguis and Zammit (in this issue). The review found that the fourth-grade texts primarily focused on narrative texts, and the sixth-grade texts used expository reading passages. They did report that cause and effect as well as problem and solution text structures were used in the organization of text passages. Unfortunately, the questions and activities focused more on recall and did not emphasize the main ideas, summaries, and inferences.

In Kenya, textbooks used expository and narrative texts for presenting comprehension instruction. Beerwinkle and McKeown (in this issue) reviewed the elementary grade textbooks and found passages with multiple genres and culturally responsive content. Due to the focus on texts and questions in the textbook, authors coded 344 comprehension questions in the Standard 4 text and 359 comprehension questions in the Standard 5 text to draw conclusions about the type of learning that may be occurring with the support of these textbooks. It was found that that over 58% of the questions focused on direct recall, and fewer were devoted to connections with the reader (13%), background knowledge (15%), and inferences (15%). Interestingly, less than 2% of questions were devoted to vocabulary, and none were related to summarization or main ideas and text structures.

In conclusion, textbooks play a central role in K-12 education across the world. They are a multi-billion dollar industry supposed to translate evidence-based practices for reading and state and national standards into curricula that can be used effectively by teachers and their students. These reviews show that textbooks are using culturally relevant narrative texts and expository passages for higher grade levels. All authors noted that evidence-based practices were not being implemented in the reviewed textbooks, and the post-reading questions and activities were not promoting higher-order thinking skills. Based on the componential model of reading (Aaron et al. 2008) we can suggest that textbooks need to be better aligned with evidence-based practices like the FASCT text structure based reading comprehension strategy and provide evidence-based instruction on reading comprehension in order to change the worldwide challenge of poor reading comprehension.

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