Using Information Trade Books as Models for Teaching Expository Text Structure to Improve Children's Reading Comprehension: An Action Research Project

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ABSTRACT
Because informational texts present special comprehension demands for young students, the authors review the research on teaching expository text structures to improve comprehension. They discuss examples of well-structured expository trade books and a model lesson plan for teaching text structure. Finally, they describe preliminary evidence based in action research that shows the text structure group's posttest comprehension scores are significantly higher than the control group's scores.

Most young children love information books. When asked what books they would "like to have to keep," 84% of first-grade children chose information texts (Mohr, 2003). When Nell Duke (2000) reported her findings that children either read or wrote information text an average of 3.6 minutes per day in first-grade classrooms, the result was a proverbial "whack up-side the head" for publishers, researchers, and classroom teachers alike in the field of literacy. Why was this finding so shocking? Today, unlike what was reported at the turn of the millennium, teachers and children have access to a wide variety of recently published information trade books of high quality (Casbergue & Plauché, 2003) on which they have been encouraged to focus their reading instruction. In an era of knowledge generation and consumption, Alexander (1997) has called for reading instruction to focus more intently on "knowledge seeking" (Alexander & Jetton, 2000; Dreher, 2003; Duke, 2004; Guthrie, Hoa, & Wigfield, 2007; Reutzel, Smith, & Fawson, 2005). Information books thus are one way to focus primary grade classroom reading instruction more intently on knowledge acquisition and generation.

Information books present special comprehension and composition demands for classroom teachers and young students (Alexander & Jetton, 2000; Sanders & Schilperoord, 2006). "The genre of the text imposes a structure on the organization of ideas within the text, and when necessary, on the organization of knowledge itself" (McCutchen, Teske, & Bankston, 2007, p. 464). Unlike narrative texts, the relatively unfamiliar structure of expository or information text has long been shown to pose difficulties for readers and writers (Farnan & Dahl, 2003; Graesser, Golding, & Long, 1991; Zabrucky & Ratner, 1992). There are several explanations for differences in children's awareness of expository and narrative text structure. One explanation is that narrative texts contain familiar content (Graesser, et al., 1991). Another explanation is that young children have many more experiences at home and in school with narrative texts (Duke, 2000). Another explanation suggests that sensitivity to text structures may be developmental (Englert & Thomas, 1987). Only recently has research focused on information text structure as a means for improving the comprehension of young children (Hall, Sabey, & McClellan, 2005; Kucan & Beck, 1997; Williams, 2005).

We have several purposes for this article. First, we present an overview of research on the teaching of expository text structure to young children to improve their comprehension. Second, we describe several examples of "well-structured" expository trade books to be used for teaching young children text structure. Third, we present a model lesson plan for teaching text structure to third graders when reading information trade books. And fourth, we report preliminary evidence for the effectiveness of using our model text structure lesson in two third-grade classrooms to improve young children's comprehension of information books.

What does the research say about teaching primary-aged readers expository text structure?
In the past few years, three experimental studies have focused on improving primary grade students' reading of expository texts using text structure as a comprehension strategy. In the first of these three studies, Williams (2005) investigated the effects of text structure instruction on the expository text reading of 128 randomly assigned struggling second-grade readers in 10 intact classrooms in three schools in New York City public schools. Williams (2005) found the text structure group scored significantly higher than either of the other two groups (content instruction or no instruction).
not only on the instructed paragraph but also on transfer paragraphs. Hall, Sabey, and McClellan (2005), in the second of three studies, investigated the effect of teaching text structure to students assigned to one of three treatment conditions: (a) text structure instruction, (b) content instruction, and (c) no instruction. The findings of this study suggest that text structure is an effective strategy for promoting expository text comprehension among normally developing readers in second grade. Reutzel, Smith, and Fawson (2005) investigated teaching 80 randomly assigned second-grade students to use single or multiple comprehension strategies while reading science information books. One of the strategies used in the multiple strategy treatment was text structure instruction coupled with the use of graphic organizers. This study provided additional evidence that teaching text structure, when combined with other effective comprehension strategies into a set of strategies, positively impacts second-grade students’ acquisition of content knowledge from text. From these three true, random experimental studies, it appears that teaching young children the text structures found in information books is not only possible, but also quite effective in improving comprehension. Williams (2005) and Hall, Sabey, and McClellan (2005) also note that text structure instruction is most effective when students receive such instruction in well-structured examples of various text structures.

What are some “well-structured” expository trade books for teaching primary grade children text structure?

Teachers often comment that they do not have the time to search for “well-structured” texts for teaching specific expository text structures to young children. We describe a selection of recently published expository trade books that can serve as models of five text structures: question and answer; problem and solution, main idea/details; cause and effect; comparison/contrast; and order/sequence.

Question/Answer Structure

In *Hello, Bumblebee Bat* by Darrin Lunde (2007a), the author has written each page of the book so that it asks a question, such as “Bumblebee Bat, what do you look like?” Each question is followed by several simple sentences that answer the question. Similar to *Hello, Bumblebee Bat; Meet the Meerkat*, also by Lunde (2007a; 2007b), poses questions. Answers follow each question.

Main Idea/Details Structure

In *It’s a Butterfly’s Life* by Irene Kelly (2007), each page has a clear main idea followed by supporting details. Main ideas include: butterflies have three main body parts, how butterflies fly, migration of butterflies, reproduction, and metamorphosis. Each main idea is supported by interesting details and detailed illustrations with labels.

*About Habitats: Deserts* by Cathryn Sill (2007), has three main ideas, each of which is stated on an introductory page and elaborated through several supporting detail sentences, each also appearing on a separate page of the book.

*Face to Face with Caterpillars* by Darlyne A. Murawski (2007) begins with an introductory chapter that uses a sequence text structure, but the subsequent chapters, “Eating Machines” and “Self-Defense,” are written using a descriptive text structure to explain what caterpillars eat and how they protect themselves from threats.

*Super Swimmers: Whales, Dolphins, and Other Mammals of the Sea* by Caroline Arnold (2007) effectively uses subheadings, main idea sentences, and elaboration to present information about many characteristics of sea mammals.

Cause and Effect Structure

*Cactus Hotel* by Brenda Guiberson (1991) follows a cause and effect chain of events structure, beginning with fruit falling from a saguaro cactus. This leads to the planting of a new saguaro, its subsequent growth to maturity at 50 feet tall and 150 years old when it serves as a home for birds, insects, packrats, and bats. After falling over at 200 years, it becomes a home for scorpions and millipedes and provides shade for desert reptiles.

In *A River Ran Wild* by Lynne Cherry (1992), the gradual pollution and reclamation of the Nashua River is explained in terms of cause and effect. For example, clear cause and effect is shown in these two sentences: “Chemicals and plastic waste were also dumped into the river. Soon the Nashua’s fish and wildlife grew sick from this pollution.”

In *Arctic Thaw: The People of the Whale in a Changing Climate* by Peter Lourie (2007), on pages 16-20 the author explains the greenhouse effect and how it is causing Arctic sea ice to melt.

Comparison/Contrast Structure

*Snakes: Biggest! Littlest!* by Sandra Markle (2005) compares small snakes such as the garter snake to large snakes such as the reticulated python. Similarities of snakes are also explained.


Steve Jenkins (2004; 2007), well-known for his paper collage illustrations in books like *Actual Size*, compares the origins, development, and behaviors of dogs and cats in *Dogs and Cats*. He treats the subjects separately, but each gets equal importance because of the structure of the book. One cover and one half of the book feature dogs. To read about cats, the reader flips the book over and the other cover and other half of the book feature cats. In the middle two page spread, both dogs and cats are featured and a paragraph headed “Friends or enemies” focuses on each animal separately.

Order/Sequence Structure

*Pumpkins* by Ken Robbins (2006) is a photographic essay that recounts the growth of a pumpkins from first
plucking to carving and the rotting of the few left to die on the vine, whose seeds go on to make more pumpkins for the next year.

In Apples by Jacqueline Farmer (2007), the first and longest section of this book is subtitled “Growing Apples” and provides a sequential description of how apple trees are cultivated from rootstock, pollinated, harvested, sorted, and distributed.

Clarabelle: Making Milk and So Much More by Cris Peterson (2007) explains all the steps involved in getting milk from Clarabelle, a Holstein cow. Included is a description of how the cows’ manure is turned into electricity, fresh bedding for the cows, and fertilizer for the crops that are grown to feed the cows.

A Lesson for Teaching Text Structures Using Information Trade Books as Models

We developed a template for a text structure lesson using Williams’ (2005) lesson descriptions as a guide. We cannot provide sample lesson plans for all of the text types we describe previously within the confines of this article. Consequently, we decided to fully develop one model lesson for teaching order/sequence text structure. We begin our lesson by creating an order/sequencing graphic organizer and several sentence strips (See Figure 1 on page 34). The boxes within the graphic organizer depict the sequence by using arrows, reinforcing the sequential flow of the ideas. The sentence strips were constructed so as to be easily attached and removed from the graphic organizer using Velcro® strips. The same effect can be somewhat achieved by using sentence strips, sticky notes with arrows, and a pocket chart.

Our model order/sequence text structure lesson plan followed these steps:

- **Preview** the purpose of the lesson by explaining to the students as follows: “This is an expository text. Expository books are written using different organizations to communicate or tell about information. This book, ________, is written using an order/sequence text structure. Order or sequence text structure tells the order in which events happen or a series of events that happen over time.”

- **Display the order or sequence clue words** and phrases below (large text provided). Discuss how these words indicate the order in which events happen in time.

- **Before reading aloud**, display the sentence strips in mixed up order. Read them aloud and ask the students to predict the correct order. As they predict, reorder the strips accordingly.

- **Read** the target text aloud.

- **During the read-aloud**, encourage students to notice if their predictions about the order were correct. If they notice an event that is out of order, discuss the reasons for the necessary change and then make the change accordingly.

- **After reading**, students independently use a smaller version of the sequencing map to put the sentences in the correct order (be sure to remove the large text sentences from display when children are asked to work independently). Follow up by having the students check their sequence against the correct sequence.

Action Research Evidence for Teaching Text Structure Using Children’s Information Trade Books to Improve Student Comprehension

In order to assess the effectiveness of our model order/sequence text structure lesson on students’ comprehension, we recruited two third-grade classrooms at a local public school. The teachers in these classrooms possess advanced degrees in education. The classroom composition was 75% Caucasian and 25% Hispanic, Asian, and African-American with at least one special needs student in each classroom.

Both third-grade classes were given a prior knowledge assessment (Langer, 1982). This prior knowledge assessment requires students to access and express their prior knowledge as answers to probing questions. Students are presented with words taken from a target text. They are asked “What comes to mind when you hear ______?”. After they respond to this initial prompt, they are asked, “So what does _______ mean?” and “Do you have any other ideas about ______?” (See Appendix A). Their responses to these prompts were evaluated using a scoring rubric resulting in the rating of students’ prior knowledge according to three different levels. If the student responded with category labels, definitions, analogies, or relationships, the response indicated MUCH knowledge and three points were assigned. If the student responded with examples, attributes, or defining characteristics, the response indicated SOME knowledge and two points were assigned. If the student answered with personal associations or experiences, morphemes, or sound alikes, the response indicated LITTLE knowledge and one point was assigned. Langer suggests that this assessment works well with groups of 8 to 10 students when the purpose is to determine whether students have sufficient prior knowledge to successfully read a text.

For the purposes of this research project, we assessed each student individually because our purpose was to determine if the individuals within the two groups of students possessed equivalent levels of prior knowledge before reading the text and receiving the text structure lesson. After giving the prior knowledge pretest, we compared the two groups’ initial mean scores (Control group = 22.04; Text Structure Group = 22.04) using an independent t-test, t(149) = .001, p < .99, that showed no difference between the two groups’ assessed prior knowledge about the content of the book Dinosaur Tracks at the outset of the study.

In the control classroom, the teacher read aloud Dinosaur Tracks by Kathryn Zoehfeld (2007) in a traditional manner. The discussion questions for this traditional read-aloud (the control condition) are found in Figure 2.
Figure 1: Sequence board, clue words, target text

1. More than sixty-five million years ago, dinosaurs walked the earth and left tracks.
2. When scientists study the tracks, they can figure out what kind of dinosaur made them and figure out the shape of dinosaur feet.
3. Next, sand covered their tracks.
4. When they find a series of tracks, called trackways, scientists learn how the dinosaurs walked.
5. After millions of years underground, the dinosaur tracks are uncovered.
6. For millions of years, the fossilized tracks lie deep underground.
7. Then, heat and pressure inside the earth begin to move the layers upward, and at the same time, wind and rain wear away the top layers.
8. Year after year, more layers build up and cover the solid layer of tracks.
9. A few years later, the tracks get buried in mud.
10. Slowly, water with carbonate in it seeps through the layers of mud and sand, turning the mud into solid stone.

Clue Words/Phrases for Sequence in Dinosaur Tracks
- after the dinosaur has gone
- a few years later
- now
- year after year
- for millions of years
- then
- at the same time
- after millions of years

Figure 2: Traditional read aloud discussion questions
Read aloud Dinosaur Tracks, stopping on the pages indicated to ask questions. When students answer the questions, respond to their answers with feedback such as, Hmm... that's interesting. That's a good thought. What makes you think that?
bottom of p. 7: What happens to most footprints after a while?
bottom of p. 11: How did the dinosaur tracks become fossilized?
bottom of p. 12: How do the dinosaur tracks get uncovered?
bottom of p. 15: What do we know about how meat-eating dinosaurs walked?
bottom of p. 19: What do we know about how plant-eating dinosaurs walked?
bottom of p. 25: What is a trackway? Why is finding trackways important?
bottom of p. 31: What have scientists learned about dinosaurs from studying their tracks and their skeletons?
In the text structure instruction classroom, the teacher followed our model lesson plan. First, she previewed the purpose of the lesson. She reviewed the clue words and phrases from *Dinosaur Tracks* and engaged the students in a prediction of the order of the sentences. Then, as she read aloud to them, the students raised their hands to explain how the sentence strips should be reordered. After the read-aloud, the teacher led the students as they evaluated the order of the sentence strips. When everyone was satisfied that the order was correct and matched the sequence presented in the book, the teacher covered the classroom sentence strip board and sent the students back to their seats to individually reorder the sentence strips using an 8½ by 11 inch version of the order/sequencing graphic organizer.

After the instruction was completed in the text structure classroom and discussion was completed in the control group classroom, both classes were given a posttest consisting of comprehension questions derived from *Dinosaur Tracks* (See Appendix B). To determine whether or not the explicit text structure lesson had the desired effect on students’ comprehension of the book *Dinosaur Tracks*, we used an Analysis of Covariance (ANCOVA) with the prior knowledge pretest ala’ Langer (1982) as the covariate. We tested for homogeneity of variance and regression slopes and found the assumptions for using Analysis of Covariance to be satisfied. The difference between the control group and the text structure lesson group posttest mean scores on the comprehension questions was significant ($F (1, 48) = 18.4, p < .000$). The effect size was .28 using a partial $\eta^2$ (eta squared) statistic. Using Cohen’s interpretation guide of .01-.05 as small, .05-.14 as moderate, and .15 and up as large, a .28 partial eta squared is a large effect size favoring the “well structured” trade books as models for teaching text structure lessons to improve third-grade students’ comprehension of information books.

**Using “Well-Structured” Trade Books as Models to Improve Students’ Comprehension of Information Books Works!**

Exposure to informational books may not be as uncommon as it used to be (Duke, 2000), but the traditional read-aloud lesson used as the comparison in this study was the kind of read-aloud session one often sees in elementary classrooms when narrative or information trade books are read aloud. The teacher reads aloud in an engaging manner, asks a few questions – some literal and some inferential – and moves on, assuming that students have learned something. What was intriguing about the posttest results for the traditional read-aloud group was how often students answered based on prior (incomplete and/or incorrect) knowledge. Even though the book was displayed in front of them, and they were told that the questions were based on the book their teacher had read, students responded to the question “how do the dinosaur track fossils get uncovered so people can find them?” with answers like “scientists use radar to find them” and “people use a machine to find them.” The book had explained that heat and pressure move the lower layers upward and wind and rain wear away the top layers, but these students were answering based on faulty or incomplete background knowledge, not on what they had just heard read aloud in the book. None of the students’ responses to this question in the text structure lesson group relied on misconceptions, or incomplete prior “knowledge.” The significant difference between the two groups might be further enhanced in future lessons by also explicitly addressing prior knowledge, including misconceptions, which Smolkin and Donovan (2003) suggest teachers do.

When teachers read aloud an information book, they usually assume that students “get it.” Some do; some don’t. In terms of retention of information, research has shown that students retain content from an informational book better when the content is embedded in a story (Jetton, 1994). Work like this might also be done in the context of an interactive read-aloud during which the teacher models attention to text structure and scaffolds students’ understanding of how text structure affects the presentation of ideas in a text (Smolkin & Donovan, 2001).

In this lesson, the teacher scaffolded students’ understanding through a pre-reading activity of predicting the order of the sentence strips, which introduced students to the major ideas in the book. During reading, the teacher stopped and asked students to re-order the sentence strips in the sequence of the presentation. Thus, students’ attention was refocused on crucial information as well as the order of the information. After reading, in an independent activity, students were asked to re-order the sentence strips individually. This allowed them to revisit the major ideas once again in sequence. This purposeful redundancy provided consecutive opportunities to invoke the use of text structure resulting in improved reading comprehension as evidenced by the differences found between the two groups on the posttest reading question scores.

This article has shown that using high quality, well structured expository trade books as models for providing lessons on text structure is more effective than merely reading information books aloud and discussing these same books insofar as students’ reading comprehension is concerned. With consistent and long term teacher guidance and practice, students will begin to recognize and use various expository text structures to structure their memory for text information. They will also be able to use graphic organizers to effectively re-represent the structure of ideas within information books. And eventually, students will be able to assume greater responsibility for comprehending information books on their own and engaging successfully in knowledge seeking (Alexander, 1997; Neuman, 2001).
ABOUT THE AUTHORS

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Parker C. Fawson is currently an Associate Professor of Reading and Associate Department Head at Utah State University in the School of Teacher Education and Leadership. Parker was a classroom teacher in 1st, 3rd, 4th, and 6th grades and now teaches at Utah State University. Parker has broad experience working with teachers of struggling readers in high poverty settings including elementary schools in both urban and rural environments. Parker has been a National Faculty Associate, as well as a reading consultant for The National Urban Alliance.

Selected References


comprehension acquisition, and comprehension instruction in a first-grade classroom. Elementary School Journal, 102, 97-122.


Children's Literature Selected References


Appendix A

Assessment of prior knowledge

Based on Langer (1982)

Name of student: ___________________________ Teacher: ___________________________

Phrase 1: When I say ___________ , what comes into your mind or what do you think about?

Phrase 2: So, what does ___________ mean?

Phrase 3: Do you have any other ideas about ___________ ?

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Appendix B
Posttest for Dinosaur Tracks
Say, "Hi, name of student. I'm going to ask you some questions about the book your teacher just read to you."
(Show book cover).

For each question, to probe for more information, say, "What else can you tell me about ___________________?"

If the student's answer matches one of the possible answers below, check it. If it matches partially, draw a line through the parts of the answer the student left out.

If the answer doesn't match any of the possibilities provided, record the major content of the student's answer in the space provided.

1. What happens to most footprints that are made in sand or mud?
   __ they wash away
   __ they dry out and blow away in the wind

2. If a footprint is going to become a fossil, what has to happen first?
   __ the footprint is covered in sand and mud
   __ the stream rises and spreads sand over the footprints

3. What happens after the dinosaur's tracks are covered up with sand and mud?
   __ water gets in and turns the mud to stone
   __ the mud turns to stone
   __ the dinosaur's tracks turn into fossils

4. How long are the fossil tracks underground?
   __ a long time
   __ millions of years

5. How do the dinosaur track fossils get uncovered so that people can find them?
   __ heat and pressure move the lower layers upward and
   __ wind/rain wear away the top layers

6. How do scientists figure out what dinosaurs' feet looked like?
   __ fossils of footprints and dinosaur skeletons are compared

7. What do scientists learn from looking at fossil footprints?
   __ different types of dinosaurs had different kinds of feet
   __ study the tracks to figure out which type of dinosaur made them

8. What is a trackway?
   __ a series of two or more tracks made by the same animal
   __ a set of footprints

9. What can scientists learn from studying trackways?
   __ they give clues about whether a dinosaur was walking or running
   __ meat-eating dinosaurs (theropods) left footprints with three main toes
   __ meat-eating dinosaurs (theropods) sometimes had one small toe that pointed inward
   __ theropod tracks looked like bird tracks
   __ little theropods had long narrow tracks
   __ T. rex-sized meat eaters made wide tracks
   __ Plant eaters had three toes
   __ Plant eaters could walk on hind legs or all fours
   __ sauropods (4-legged plant eaters) had dainty front feet
   __ sauropods had huge oval-shaped hind feet
   __ hard to find tracks of stegosaurs, armored dinosaurs, and horned dinosaurs
   __ sauropods lived in herds
   __ other plant eaters and meat eaters may have lived in groups

10. What have scientists learned from studying the skeletons of dinosaurs?
    __ birdlike tracks were made by theropods
    __ theropod dinosaurs were the ancestor's of today's birds
    __ birds and dinosaurs are related