Boosting Children's Language Skills: Using Mindmaps in Early Childhood Education

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This short excerpt shows a frequently occurring practice in early childhood classrooms: shared book reading. In fact, it is estimated that more than 90 percent of early childhood teachers reads to their class at least three times a week (Ghonem-Woets, 2009). Why do they do it? The benefits of shared book reading can explain why teachers spend a considerable amount of time using this strategy. Research has indicated, for example, that shared book reading teaches children how to engage with books and makes them aware of letter-sound relations, which is foundational for learning to read (Zucker, Ward, & Justice, 2009; also see Pollard-Durodola et al., 2016; Gonzalez et al., 2010).

Miss Jane[1] is reading the book *The Black Rabbit* (Leathers, 2013) to her preschool class (children ages 4-6).

Miss Jane: (Reads) But oh! There was something completely wrong. He was not alone. Rabbit got scared. "Go away, Black Rabbit!", he yells. But the Black Rabbit doesn't move. (Pauses) Tom, how does Rabbit feel?

Tom: Scared.

Miss Jane: Why?

Tom: Black Rabbit.

Miss Jane: Because he is scared of the Black Rabbit? (Tom nods) Yes. Who else is scared sometimes? David? Are you ever scared?

David: No, not at all. I'm not even scared of bats. I've seen one once, you know.

Miss Jane: Okay, so that's not something you're scared of? Let's ask Lindsey. Lindsey, are you ever scared? (Lindsey nods) Yes? When are you scared?

Lindsey: Of slugs.

Miss Jane: Slugs! And why is that?

Lindsey: Because they … on the ground … but … I just find them a bit scary.

Miss Jane: You find them a bit scary. Because they are a little slippery? (Lindsey nods). Okay, let's move on and see how the story goes.

(All names are pseudonyms)

There are, however, many ways in which teachers can implement shared book reading in their classroom. Some approaches might be more effective than others. According to sociocultural theory, learning is a social process, meaning that children learn by participating in meaningful sociocultural activities (Vygotsky, 1978;). It is, therefore, not surprising that shared book reading has been found to be even more effective when teachers actively engage children in classroom discussions (Gosen, 2012; Mol, Bus, de Jong, & Smeets, 2008; Mol, Bus, & de Jong, 2009). This type of shared book reading is generally referred to as interactive book reading.

Interactive book reading and its effect on language skills

During interactive book reading, the teacher bridges the gap between written and spoken language by explaining difficult concepts and asking children to respond to the story that is being read. This creates opportunities for children to participate in complex discourse in which they are encouraged to use academic language (Mol et al., 2008; Mol et al., 2009).

An important question is, however, how can teachers implement interactive reading in their classroom? Specifically, although the

predictable storylines and re- petitive character of picture books makes them highly suitable for recurrent and in-depth discussions, not all types of classroom discussions are considered interactive. Traditional classroom discussions, for example, have been criticized for being overly teacher-steered and primarily focused on the reproduction of factual knowledge (Boyd & Kong, 2015).

There have been several attempts to increasingly involve children in classroom discussions where they are encouraged to carefully listen to each other, negotiate meanings, and collaboratively make progress in their thinking (e.g., Michaels & O'Connor, 2012; 2015). Such discussions have shown to be positively related to the development of children's language skills (Howe & Abedin, 2013; Resnick, Asterhan, & Clarke, 2015).

Research has indicated that shared book reading that is characterized by interactive classroom discussion elicits relatively complex vocabulary and, consequently, contributes to children's vocabulary acquisition (Gonzalez et al. 2014). In addition, this type of book reading has also been found to be related to building listening, comprehension, and narrative skills (Lever & Sénéchal, 2011; Mol & Bus, 2011). Lever and Sénéchal (2011), for example, showed that children who were involved in an interactive reading intervention became better at structuring their narratives and increasingly included references to the story's characters and events.

The use of mindmaps: An alternative way?

Besides interactive book reading, there are also alternative ways to promote children's language skills during shared book reading. One such alternative concerns the use of visual supports, like graphic organizers. Graphic organizers can be defined as "spatial arrangements of words (or word groups) intended to represent the conceptual organization of text" (Stull & Mayer 2007, p. 810). The assumption is that they help learners in structuring and interpreting new information by offering a framework that relates new knowledge to prior knowledge (Dexter & Hughes, 2011; Dexter, Park, & Hughes, 2011; Sam & Rajan, 2013).

Figure 1. Example of a mindmap of the picture book The Black Rabbit (Leathers, 2013)
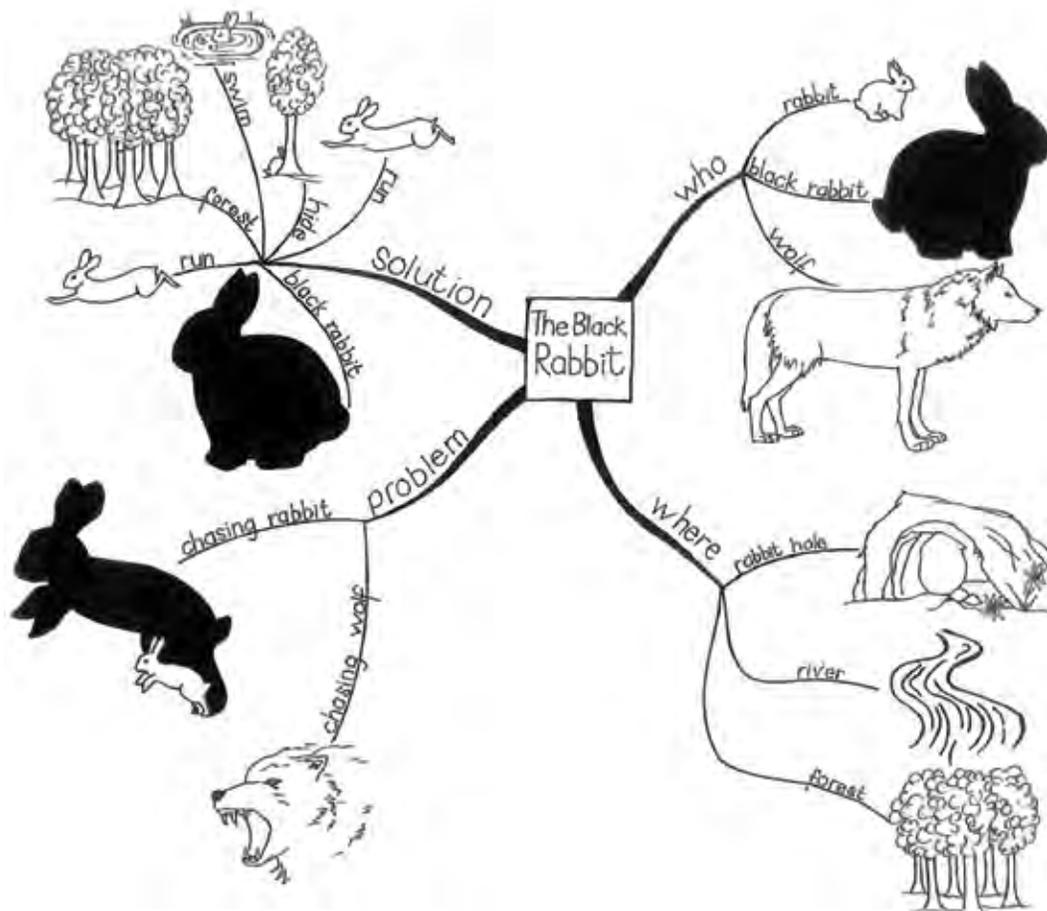
One particular type of graphic organizer is being increasingly used during interactive book reading: mindmaps (see Figure 1 for an example). Mindmaps have many similarities with word webs because they present a story's central theme in the center, from which several main branches emerge (Buzan, 2005). These main branches represent a story's main concepts. Nevertheless, mindmaps are also unique. In contrast to word webs, which usually represent all concepts at merely one level, mindmaps represent a story's subordinate concepts by sub-branches that are connected to the main branches. Together, these branches reflect the structure of the story and show the relations between its different parts (Somers, Passerini, Parhankangas, & Casal, 2014). Figure 1 provides an example of a story mindmap.

The particular principles upon which mindmaps are usually constructed are based on insights from educational studies and brain research. These principles consider, for example, the number of concepts that should be included (Stull & Mayer, 2007). As mindmaps are being increasingly used in educational settings, mindmap-principles have been found to be very helpful (Buzan, 2005).

Mindmaps promote understanding

Based on the cognitive load theory (Sweller, 1994; Paas, Renkl, & Sweller, 2003), it might be expected that the use of mind-

maps during shared book reading can have a facilitative effect on learning. According to this theory, learners process information in their working memory. When learners receive a lot of new information (as would be expected in the case of young children who hear a story for the first time), one's working memory gets overloaded. An overloaded working memory cannot function properly.

In particular, learners whose working memory system are overloaded cannot concentrate on teacher instructions, experience difficulties in remembering information, and find it harder to keep track in structured learning activities (Gathercole & Alloway, 2008). Over time, these missed learning opportunities might result in poor academic attainment (Holmes, Gathercole, & Dunning, 2010). Mindmaps could provide a solution to this problem by serving as a tool to help structure new information. The structured manner in which new information is visualized in a mindmap might reduce children's cognitive load and, thereby, support their learning.

How to use mindmaps in early childhood education

As children in early childhood classrooms are often in an emerging literacy stage, not yet able to write or read, an important question is: Can mindmaps be used in early childhood education? The work of Gallenstein (2013) has provided valuable clues of how mindmaps can be adapted in order to suit the needs of young children, for example by using pictures. Based on Gallenstein's work, as well as that of Buzan (2005), early childhood teacher Miss Rianne designed a mindmap approach that can be implemented during shared book reading activities in early childhood classrooms. This approach is explained below by using an example of a mindmap based on the book The Black Rabbit (Leathers, 2013).

Preparation – Choose a picture book

Choose a picture book that you would like to read during shared book reading. Ensure that the book has rich illustrations, contains challenging vocabulary, and suits the interests of your students. On a large piece of paper, write the title of the book in the center. You will read this book three times, but each reading session focusses on one/two central question(s) that is/are asked prior to reading the book:
1. Who are the characters in the story?
2. Where does the story take place?
3. What is/are the main problem(s) in the story?
4. What is/are the main solution(s) in the story?

Reading session 1 – Who are the characters in the story?

During the first session, introduce the picture book (e.g., by reading the title of the book and looking at its pictures). Next, ask the first question: "Who are the characters in the story?" Ask children to listen carefully while you read to them and to focus primarily on the characters of the story. Interrupt as little as possible while reading the book. After you finish reading, discuss question 1 and, together with your students, create the first branch of the mindmap (the "who" branch). Draw a large branch that starts from the center and is directed towards the upper right corner (wide near the center, thin towards the outside). Above this branch, write the word "who". Next, draw smaller branches that are connected to this main branch. The number of smaller branches depends of the number of characters in the story. Based on the input of your students, write the names of the main characters above the smaller branches and use (existing) pictures (or draw them yourself) that represent the main characters of the story. In our example, the book "The Black Rabbit" contains three main characters: Rabbit, Black Rabbit, and Wolf (see Figure 1).

Reading session 2 – Where does the story take place?

During the second session, first activate children's prior knowledge by asking them about the main characters of the story. Next, ask children to focus on question 2: "where does the story take place?" while you read the book for the second time. Afterwards, discuss the different locations of the story and collaboratively create the second branch of the mindmap (the "where" branch). This time, draw a large branch starting from the center, but now directed towards the lower right corner. Write the word "where" near this branch and then draw smaller branches that are connected to this branch. Write the names of the locations above the smaller branches and use pictures to represent the different locations. In "The Black Rabbit", three locations can be identified: rabbit hole, river, and forest (see Figure 1).

Reading session 3 – What is/are the main problem(s) and solution(s) in the story?

During the third and final session, activate children's prior knowledge again (e.g., "Who is the story about? Where does the story take place?"). Next, ask children to focus on question 3 and 4: "what is/are the problem(s) in the story?" and "what is/are the solution(s)?" before reading the book one last time and discussing these questions afterwards. During the discussion, collaboratively construct the final two branches of the mindmap (the "problem(s)" branch and the "solution(s)" branch): one branch starting at the center and directed towards the lower left corner and another branch starting at the center and directed towards the upper left corner. Write "problem" near the lower branch and "solution" near the upper branch. Draw smaller branches and write keywords and use pictures to represent the main problem(s) and solution(s). "The Black Rabbit" describes two main problems (chasing rabbit and chasing wolf) and six (temporary) solutions (run, hide, swim, forest, run, black rabbit).

Short synopsis of *The Black Rabbit*
The Black Rabbit is a children's book about a Rabbit who is confronted with a large rabbit chasing him: Black Rabbit. Rabbit is afraid of Black Rabbit and tries to get rid of him, but Black Rabbit keeps following him wherever Rabbit goes. Who is this mysterious Black Rabbit? And why won't he go away? Only from the pictures does it finally become clear that Black Rabbit is actually Rabbit's own shadow.

Figure 2 Using mindmaps in the classroom

> **Using mindmaps in early childhood education? Just try it out!**
> - Choose a picture book that you would like to read to your students.
> - Read the picture book three times and ask the following questions prior to each reading session:
>   1. Who are the characters in the story?
>   2. Where do the events take place?
>   3. What is/are the problem(s) in the story and (4) what is/are the solution(s)?
> - After reading the book, engage children in a discussion about the question that you have asked.
> - Collaboratively construct a part of a mindmap while discussing the central question. Verbalize your actions, so that children learn how a mindmap is created.
> - Finalize the mindmap at the end of the three reading sessions: include the title of the book, children's answers to the main questions, and the four branches: who, where, problem(s), and solution(s).
> - Model how children can use the mindmap during story table activities in order to help them to retell the story and thereby practice their narrative skills.

> **Want to know more?**
> - More information on mind mapping can be found on the website of Tony Buzan, who has pioneered mind mapping. The website also offers a free online course 'How to Mind Map': tonybuzan.com
> - Software for mind mapping can be found at imind map.com
> - Pinterest offers loads of examples of picture book story tables: www.pinterest.com
>
> *Programs and sources do not constitute an endorsement by SECA.*

Using mindmaps: Classroom discussions and children's language skills

What does a classroom discussion about a mindmap look like? Several teachers have tried the mindmap approach in their early childhood classroom. In Miss Lucy's class, the question about the different characters of the book *The Black Rabbit* triggered a discussion about the identity of the Black Rabbit.

Anna: Maybe it's his mom!

Miss Lucy: Whose mom?

Anna: The Black Rabbit

Miss Lucy: The Black Rabbit you mean? Is that little Rabbit's mom?

Christopher: I don't think so.

Sam: No, that's not it, because the Rabbit… No, because when there is sun, there is always shadow – when you walk outside.

Christopher: Yeah, not when it's dark!

Miss Lucy: Wait a minute, because I want to know – Anna just said: "Maybe it's his mom". If that's the case, then there is also a mom involved in the story. But Anna, now Sam explains how he thinks about it. That it's a shadow. Sam, could you repeat what you just said?

Sam: Because the Rabbit held out his hand and then the shadow did the same.

Miss Lucy: Okay, so the Black Rabbit is part of the story, and you say, Sam, that it is the shadow of Rabbit? Then let's add the Black Rabbit to our mindmap. Here we have the large branch,

the "who" branch. (Miss Lucy points to the mindmap) Now I draw a smaller branch and write "Black Rabbit". (Miss Lucy creates the branch and writes "Black Rabbit".) You see? Later today, we can add a picture of the Black Rabbit.

This excerpt shows how children support each other in improving their understanding of the story about the Black Rabbit. It also illustrates how the central question (in this case "who are the characters in the story?") structures the discussion. The use of such a main question seems to promote interactive discussions in which children are encouraged to express their ideas regarding this question and discuss these ideas in order to reach agreement. And what about Miss Lucy? Miss Lucy lets her students talk and creates parts of the mindmap while she verbalizes what she is doing.

Does the use of mindmaps during shared book reading improve children's language skills and their story comprehension? In order to investigate the effect of our mindmap approach, we conducted a large study in which seven early childhood teachers and their 143 students participated. Outcomes showed that student's language skills and story comprehension were significantly improved over a six-week period. This indicates that even young children, who are not yet able to read or write, appear to be able to understand a mindmap. Teachers who aim to engage their students in a variety of shared book reading activities are therefore encouraged to try out the mindmap-approach in their own early childhood classroom!

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