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Graphic Organizers in Reading Instruction: Why and What Merits Attention?

QIAO Ping[a],*

[a]College of Foreign Language Education, China West Normal University, Nanchong, China.
*Corresponding author.

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Abstract

Graphic organizers have been widely used in classroom teaching to address different needs of students. This paper particularly discusses the theoretical soundness of graphic organizers in facilitating reading comprehension and its implication on reading instruction.

Key words: Graphic organizers; Reading comprehension; Reading instruction

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INTRODUCTION

Graphic organizers, or the "visual and graphic display that depicts the relationships between facts, terms, and or ideas within a learning task", have been widely used in various kinds of learning tasks and brought about fruitful outcomes (Hall & Strangman, 2002). The effectiveness of using graphic organizers to enhance comprehension may have its roots in cognitive learning theories, particularly dual coding theory, schema theory, and information processing theory.

Dual coding theory of human memory (Clark & Paivio, 1991, as cited in Sokmen, 1997) maintains the human mind contains a network of verbal and imaginal representations of information. Graphic organizers, as visual cues, can help students build links between verbal and non-verbal representations of information, making the abstract knowledge concrete within the conceptual range of the students, and thus enhance understanding.

Schema theory (Bartlett, 1932, ascited in Hudson, 2007) emphasizes the link between new information and old knowledge. Graphic organizers can present the inner relationships between ideas within a larger concept and make them more organized in a way easier for students to understand and retain.

Information processing theory (MacLaughlin & Heredia, 1996, ascited in Mitchell & Myles, 2004) suggests working memory has a limited capacity to process information. If information is overloaded, learning and comprehension does not take place. The use of graphic organizers can help reduce the cognitive load to deal with new information.

Good graphic organizers, as virtual cues, can "show at a glance the key parts of a whole and their relations, thereby allowing a holistic understanding that words alone cannot convey" (Jones, Pierce, & Hunter, 1989, p.21) and therefore, facilitate comprehension and learning.

1. GRAPHIC ORGANIZERS AND READING INSTRUCTION

One challenging aspect of language teaching is that it "involves the detailed reading of texts with the two goals of understanding the text and learning language features" (Nation, 2004, p.20). Typically, texts chosen for intensive reading are always those with "unfamiliar subject matter, discourse features, or unfamiliar grammar and vocabulary items" (Ibid.). Those texts are particularly difficult for students to understand without teachers' assistance.

According to Meyer (1975, 1985, as cited in Hudson, 2007) and Dijk and Kintshch (1983, as cited in Hudson, 2007), understanding a reading text often goes through two levels of comprehension. While microprocesses are connected to the local understanding of every single detail of the text in a bottom-up manner, macroprocesses

are related to global understanding, to how readers form "an overall idea about the gist of the text" (Kintsch & Yarbrough, 1982, p.828). However, the two levels of comprehension may not be perfectly matched: "A text may be difficult to process at the microlevel but not at the macrolevel, and vice versa" (Ibid.).

Therefore, effective reading instruction should not only help students develop decoding skills to read better but more importantly, go beyond the local details of a text and contribute to students' macro-level comprehension, which is related to the overall rhetorical organization of texts (Kitntsch, 1982, as cited in Hudson, 2007).

Research in rhetoric, cognitive psychology, and written discourse analysis has confirmed that all texts have particular rhetorical organizational patterns (Grabe, 2004). Those patterns, also known as text-structures or discourse structures, show "how the ideas in a text are structured to convey a message" (Hudson, 2007, p.179). Meyer (1975, as cited in Hague & Olejnik, 1990) asserted three levels of text-structure: microstructure, associated with the interrelationship between sentences; macrostructure, connected with the essential meaning of the text; and top-level structure or schematic structure, related to larger frame discourse (genre) with a rhetorical organization that presents the writer's goal in a way with which the reader is familiar. To recognize and use the writer's top-level structure to facilitate one's comprehension is seen as an important "rhetorical strategy" (Kintsch & Yarbrough, 1982) contributing to one's overall comprehension abilities.

This knowledge of "the writer's top-level structure" largely relates to formal schema in schema theory. According to schema theory, reading comprehension calls for the interaction between a text and a reader's background knowledge, known as schema (Aebersold & Field, 1997; Carrel, 1988; Anderson & Pearson, 1984, as cited in Hudson, 2007). The meaning of a text is constructed through readers' successful retrieval of existing schema activated by and compatible with the incoming information, through simultaneous bottom-up and top-down processing (Carrel & Eisterhold, 1983). There are two types of schema readers often bring into comprehension: content schema (background knowledge of the content area and cultural knowledge) and formal schema (background knowledge of formal, rhetorical organization of different text types) (Farrell, 2000; Hudson, 2007). It seems self evident that familiarity with the topic of a text is essential for comprehension; beyond the content area of background knowledge, formal schema, especially text-structure plays a more fundamental role in reading comprehension (Hudson, 2007).

Studies over the past three decades on narrative and expository prose have evidenced that knowledge and use of textual structures differentiate good readers from poor readers (Hudson, 2007) and that the use of the formal knowledge largely depends on readers' awareness of discourse structures (Kintsch, 1982, as cited in Hudson, 2007). Training studies raising students' text-structure awareness have shown facilitating effect on reading comprehension in both L1 and EFL/L2 reading (Carrel, 1988; Carrel, 2002; Hudson, 2007). One of the most important ways is to use graphic organizers or semantic mapping to represent the rhetorical organization of a text (Grabe, 2004).

Using graphic organizers to represent text-structures often involves selecting key content from a text in a visual display such as tree diagrams, boxes, circles, spider maps in which "the relationships among the key ideas are made explicit" (Carrel, 1988). Dansereau et al.'s (1979, as cited in Carrel, 1988) "networking", Geva's (1980, 1983, as as cited in Carrel, 1988) "flowcharting", Anderson's (1978, as cited in Carrel, 1988) "mapping", and Meyer's (1975, as cited in Carrel, 1988) "top-level rhetorical structures" have been used successfully to guide students to use discourse cues to define the interrelationships within a text and diagram how ideas and their relationship are organized with improved macro-comprehension (Carrel, 1988).

Since graphic organizers "highlight the organization of text information and raise readers' awareness of the rhetorical organization of the text" (Grabe & Stoller, 2002, p.61), the implementation of graphic organizers can have at least four obvious advantages in teaching reading:

(a) The teacher can illustrate through graphic organizers how complicated ideas in a text are structured to make a single meaning to help students form a holistic view of a reading text and therefore strengthen students' understanding.

(b) The teacher can use graphic organizers to inform students of different text-structures in different text types of different cultures and add to their knowledge of text-structures, through introduction, comparison, and contrast.

(c) With constant exposures to text-structures through graphic organizers, students can recognize the important role text-structures play in reading comprehension. They can make use of their increased background knowledge of top-level structures (formal schema) to make predictions about the meaning of a text (clearly organized according to familiar structures) in a top-down manner.

(d) Through teachers' demonstrations and their own practices, students can gradually develop their metacognitive knowledge of reading and transfer their knowledge across texts and content areas, using this knowledge flexibly to make meaning and strengthen their understanding and learning.

2. CAVEATS

Although it is plausible that graphic organizers can facilitate reading comprehension, empirical studies have provided incongruent findings that cast doubts on the overall effectiveness of the use of graphic organizers

in reading instruction. For example, Griffin, Malone, and Kameenui's (1995) study showed no significant difference between instruction through graphic organizers and traditional basal instruction. However, Jiang and Grabe's (2007), in line with Hall and Strangman (2002), pointed that the disappointing findings may be attributable to deficiencies in experimental design. This suggests a little caution when we use graphic organizers in reading instruction. Some variables must be taken into consideration before practices, which include language proficiency, types of texts, types of text- structures, point of implementation, organizer creator, and instructional context.

2.1 Language Proficiency

Since graphic organizers are helpful for discourse level of comprehension which builds on lower-level skills, they may not benefit low-proficient students as much as the higher-proficient ones. Walter and wolf (1986, as cited in Hudson, 2007) found language proficiency interacts with text-structure knowledge and use, congruent with Moore and Readence's (1984, as cited in Hall & Strangman, 2002) findings that the largest effects of graphic organizers on comprehension have been reported by University populations, compare to their counterparts with lower grade levels.

2.2 Types of Texts

Although narrative and expository characterize recognizable structures, graphic organizers may be particular effective to do with expository prose (Swafford & Alvermann, 1989, as cited in Jiang & Grabe, 2007). Since narrative structure with a rather hierarchical organization is often acquired by people prior to school, older and more skilled readers may not benefit from narrative organizers as much as from expository ones depending on logical relations (Hudson, 2007).

2.3 Types of Text-Structures

Jiang and Grabe's (2007) review of research literature show that graphic organizers reflecting top-level structures are more effective on reading comprehension, probably because they can be easily transferred cross reading tasks, as is illustrated earlier. Even though, graphic organizers should not be limited to top-level structures, since most texts are "a combination of multiple text-structures, often nested one within another" (Jiang & Grabe, 2007, p.44). For instructional purpose, Jiang and Grabe (2007) suggest nine core recurring text-structures to be included in explicit instruction with different kinds of graphic organizers, which cover all texts and represent the three levels of text-structures: causation, problem/solution, comparison/contrast, classification, definition, process, argument-reasoning, time sequence, and description.

2.4 Point of Implementation

Graphic organizers may be used as advance organizers before reading to activate background knowledge, or as post organizers, after finishing the reading material to strengthen comprehension. A review of the research literature (Jiang & Grabe, 2007; Hall & Strangman, 2002) indicates that although graphic organizers can be successfully used at different stages of the instruction, more positive learning outcomes may be generated when graphic organizers are introduced after the learning material.

2.5 Organizer Creator

The effectiveness of graphic organizers can also be influenced by the creator. It seems that graphic organizers developed by the students themselves are more effective (Jiang & Grabe, 2007). Active participation in constructing organizers even partially-completed organizers can provide opportunities for students to deeply process the reading materials, or they may simply take the organizers prepared by others as new information to remember.

2.6 Instructional Context

The research literature (Hall & Strangman, 2002) has shown that instructional context is another crucial factor to influence the effectiveness of graphic organizers. Without teacher instruction on how to use graphic organizers, students may not be able to see the potential benefits. Graphic organizers can produce greater positive effects when the instructional context includes explicit instruction incorporating teacher modeling and independent construction with teacher feedback. More importantly, teachers should also clarify the purpose of using graphic organizers in reading at the outset.

To help students create high-quality organizers, students should know how to make use of linguistic clues that signal this organization beforehand; certain skills like summarization should also be trained. It has shown that training students to use graphic organizers with instruction on summarization along with linguistic clues seemed to be more facilitating to students' comprehension improvement (Jiang & Grabe, 2007).

CONCLUSION

As is shown by literature (National Reading Panel, 2000, as cited in Grabe, 2004), if designed and implemented with caution, incorporating graphic organizers into reading instruction is a quite effective way to improve students' reading comprehension. Through visual representation of the text-structure, the teacher can not only raise students' awareness of text-structures, add in their text-structure knowledge, but also provide them opportunities to become strategic readers who know when and how to use their metacognitive knowledge to facilitate their reading.

However, as an individual instruction strategy, graphic organizers should be integrated with other strategies to

benefit students of different learning styles and different language proficiency. As Merkley and Jefferies' (2001) suggested, teaching with graphic organizers should clarify relationships between the concepts represented within the organizer, provide opportunities for student input, connect new information to past learning, make reference to upcoming text, and reinforce decoding and structural analysis. Most importantly, different decisions should be made according to students' needs, institutional expectations, and local contexts.

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