EducationalImpact

Why Visual Tools for Literacy Now?

Research and Results

"The illiterate of the future are not those who cannot read or write, but those who cannot learn, unlearn, and relearn."
—Alvin Toftler

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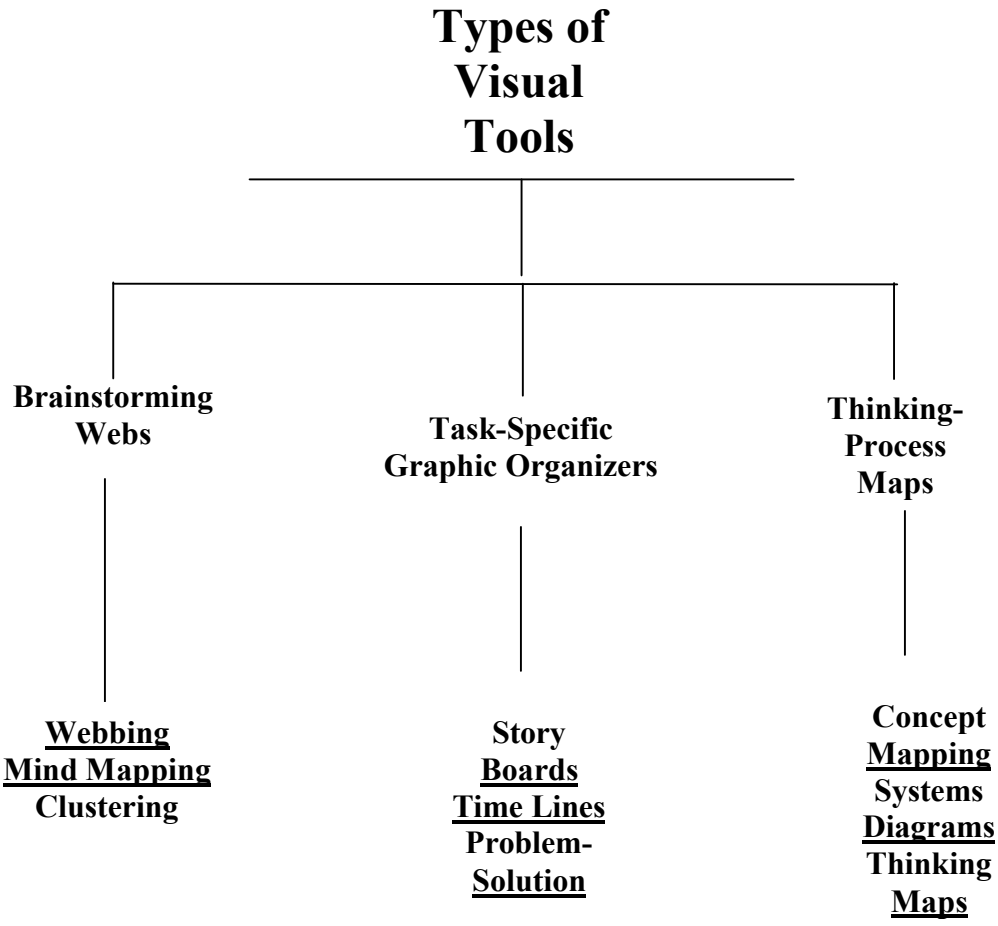
Overview to Introduction

CONSTRUCTIVISM **TECHNOLOGY**



Collaborative Work

Brain Research

The Mapping Metaphor

Figure 1.5

Characteristics of Today's and Tomorrow's Schools

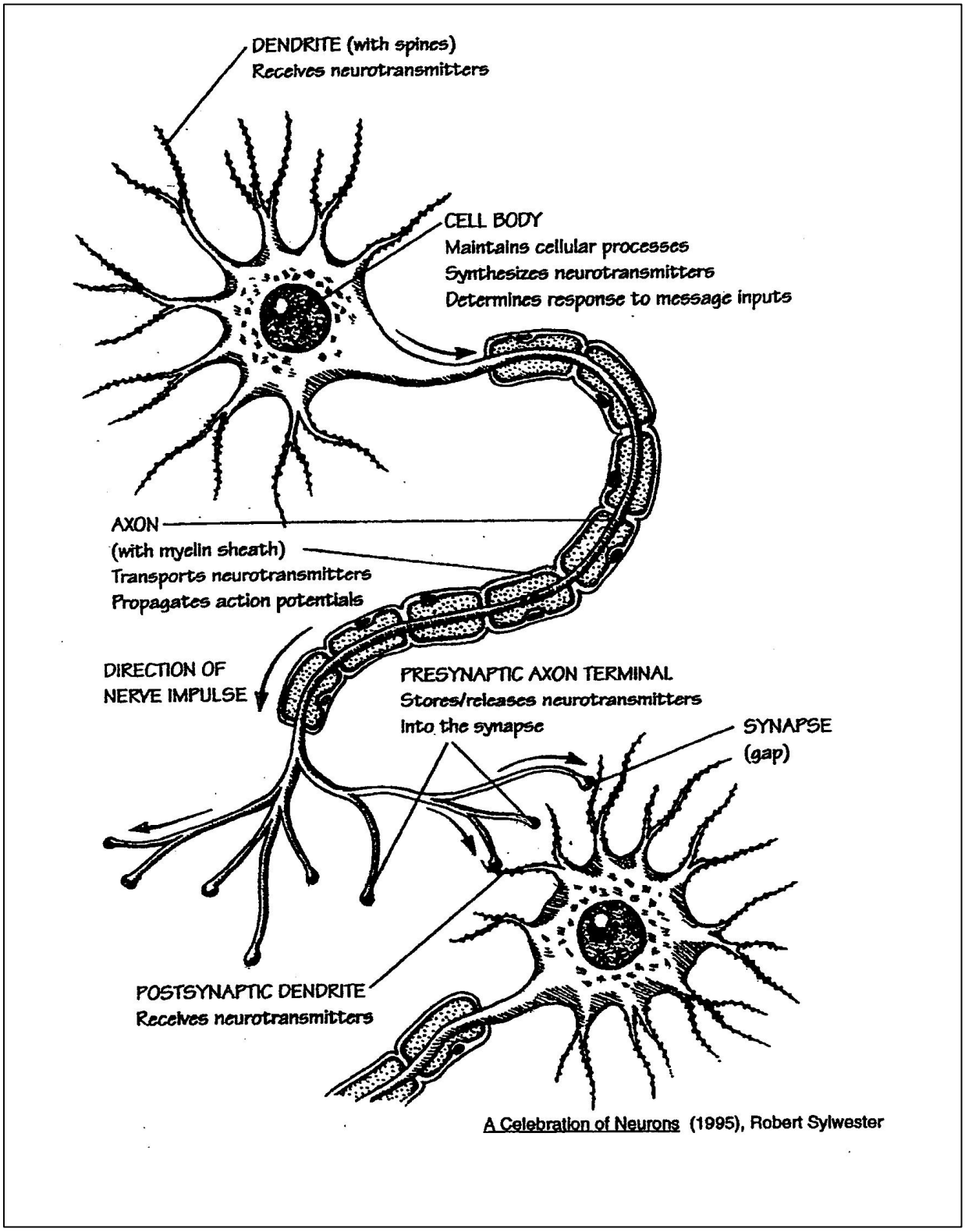
SCHOOLS OF TODAY	SCHOOLS OF TOMORROW
Focus on development of basic skills Testing separate from teaching	Focus on development of thinking skills Assessment integrate to teaching
LEARNING ENVIRONMENT	
Recitation and recall from short-term memory Students work as individuals Hierarchically sequenced-basics before higher order	Students actively construct knowledge for themselves Cooperative Problem solving Skills learned in context of real problems
Management	
Supervision by administration	Learner centered, teacher directed
Outcome	
Only some students learn to think	All students learn to think

Source: Secretary's Commission on Achieving Necessary Skills (SCANS). (1991). What Work Requires of schools: A SCANS Report for America 2000 (p.22) Washington D.C.: U.S. Department of Labor.

Rigorous tools and linked technologies that may be used to activate, construct, and communicate knowledge seamlessly from kindergarten and beyond for lifelong learning. Let's look at an inspiring example of the dovetailing of these tools from school to the workplace. In Wanganui, New Zealand, in the southern region of the northern island, is St. George's, a K-8 school that has implemented a visual tools approach over the past three years. All of the students, faculty and administrators are fluent with these visual tools, and at workshops parents learn about graphic representations and how to support their children's use of them. There have been reports of parents using these tools after learning about them from their children (isn't that exciting?!). Headmaster Alan Cooper asked parents to write about their perceptions of visual tools. Here are excerpts from parent Keith Smith's response:

I didn't know I was using anything with a name, like "Thinking Maps," until one day when Ben was doing his homework. I saw a kind of weird diagram and when I asked what it was, Ben said he was using a Thinking Map to plan a homework project. I noticed that he was doing a more developed version of how I often planned activities in my job at the time as national marketing manager for Suzuki motor vehicles

I'd start with a topic or objective and take arrows out from below it in different directions, splitting the main subject into its key parts. Then I'd split each of these out over and over until I had every-



Brain-Compatible Teaching

"The overwhelming need of learners is for meaningfulness...We do not come to understand a subject or master a skill by sticking bits of information to each other.

Understanding a subject results from perceiving relationships. The brain is designed as a pattern detector.

Our function as educators is to provide our students with the sorts of experiences that enable them to perceive the patterns that connect."

Making Connections: Teaching and the Human Brain (1994), Caine and Caine

90%
of all information that comes to our brain is
VISUAL

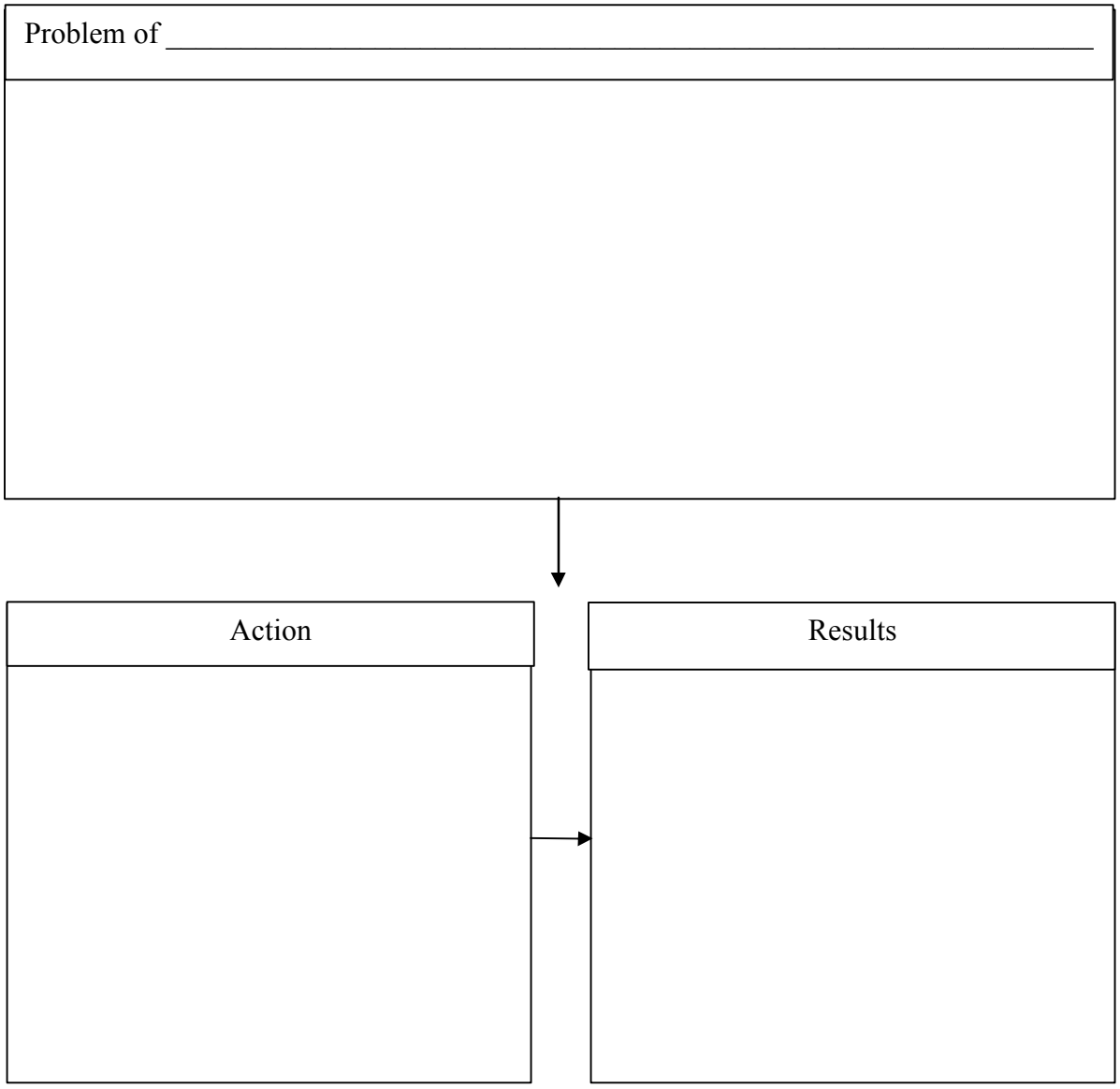
40%
of all nerve fibers connected to the brain are linked to the retina

36,000
visual messages per hour may be registered by the eyes

Brain Based Learning (1996), Eric Jensen

Figure 4.2

Problem-Solution Text Structure: Frame and Definition



Problem = something bad; a situation that people would like to change
Action = what people do to try to solve the problem
Results = what happens as a result of the action; the effect or outcome of trying to solve the problem

Source: Armbruster, B.B., T.H. Anderson, and J. Ostertag. (November1989). Teaching Text Structure to Improve Reading and Writing." The Reading Teacher 43, 2: 130-137. Reproduced by permission.

What does scientifically-based research tell us about effective text comprehension instruction?

The scientific research on text comprehension instruction reveals important information about what students should be taught about text comprehension and how it should be taught. The following key findings are of particular interest and value to classroom teachers.

Text comprehension can be improved by instruction that helps readers use specific comprehension strategies.

Comprehension strategies are conscious plans—sets of steps that good readers use to make sense of text. Comprehension strategy instruction helps students become purposeful, active readers who are in control of their own reading comprehension. The following six strategies appear to have a firm scientific basis for improving text comprehension.

Monitoring Comprehension

Students who are good at monitoring their comprehension know when they understand what they read and when they do not. They have strategies to "fix up" problems in their understanding as the problems arise. Research shows that instruction, even in the early grades, can help students become better at monitoring their comprehension.

Comprehension monitoring instruction teaches students to

- be aware of what they do understand,
- identify what they do not understand, and
- use appropriate "fix-up" strategies to resolve problems in comprehension

Metacognition

Metacognition can be defined as "thinking about thinking? Good readers use metacognitive strategies to think about and have control over their reading. Before reading, they might clarify their purpose for reading and preview the text. During reading, they might monitor their understanding, adjusting their reading speed to fit the difficulty of the text and "fixing up" any comprehension problems they have. After reading, they check their understanding of what they read. Comprehension monitoring, a critical part of metacognition, has received a great deal of attention in the reading research.

Students may use several comprehension monitoring strategies

- Identify where the difficulty occurs ("I don't understand the second paragraph on page 76").
- Identify what the difficulty is ("I don't get what the author means when she says, 'Arriving in America was a milestone in my grandmother's life.'").
- Restate the difficult sentence or passage in their own words ("Oh, so the author means that coming to America was a very important event in her grandmother's life!").
- Look back through the text ("The author talked about Mr. McBride in Chapter 2, but I don't remember much about him. Maybe if I reread that chapter I can figure out why he's acting this way now!").
- Look forward in the text for information that might help them to resolve the difficulty. ("The text says, 'The groundwater may form a stream or pond or create a wetland. People can also bring groundwater to the surface! Hmm. I don't understand how people can do that ... Oh, the next section is called Wells! I'll read this section to see if it tells how they do it!").

Using Graphic and Semantic Organizers.

Graphic organizers illustrate concepts and interrelationships among concepts in a text, using diagrams or other pictorial devices. Graphic organizers are known by different names, such as maps, webs, graphs, charts, frames, or dusters. Semantic organizers (also called semantic maps or semantic webs) are graphic organizers that look somewhat like a spider web. In a semantic organizer, lines connect a central concept to a variety of related ideas and events.

Regardless of the label, graphic organizers can help readers focus on concepts and how they are related to other concepts. Graphic organizers help students read to learn from informational text in the content areas, such as science and social studies textbooks and trade books. Used with informational text, graphic organizers can help students see how concept fit common text structures Graphic organizers are also used with narrative text, or stories, as story maps.

Graphic organizers can

- help student focus on text structure as they read;
- provide students with tools they can use to examine and visually represent relationships in a text, and
- help students write well-organized summaries of a text

Answering Questions

Teachers have long used questions to guide and monitor student' learning. Research shows that teacher questioning strongly supports and advances students' learning from reading. Questions appear to be effective for improving learning from reading because they:

- give students a purpose for reading;
- focus students' attention on what they are to learn;
- help students to think actively as they read;
- encourage students to monitor their comprehension; and
- help students to review content and relate what they have learned to what they already know.

Question-answering instruction encourages students to learn to answer questions better and, therefore, to learn more as they read One type of question-answering instruction simply teaches students to look back in the text to find answers to questions that they cannot answer after the initial reading. Another type helps students understand question-answer relationships—the relationships between questions and where the answers to those questions are found In this instruction, readers learn to answer questions that require an understanding of information that is

- text explicit (stated explicitly in a single sentence);
- text implicit (implied by information presented in two or more sentences); or
- scriptal (not found in the text at all, but part of the reader's prior knowledge or experience).

Generating Questions

Teaching students to ask their own questions improves their active processing of text and their comprehension. By generating questions, students become aware of whether they can answer the questions and if they understand what they are reading. Students learn to ask themselves questions that require them to integrate information from different segments of text for example, students can be taught to ask main idea questions that relate to important information in a text.