

# Comparison of the Effectiveness of Learning Styles Using Graphic Organizers versus Traditional Text-Based Teaching on Vocabulary Development

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*The “Makes Sense Strategies” (MSS) model (Ellis, 2004), using graphic organizers, was evaluated in a classroom setting. Based on prior research (Ellis, 2005), this study predicted an increase in vocabulary and writing skills as reflected in sentence and word length, grammar, sentence structure, and organization of thought. Comparisons were made of vocabulary development and writing skills of 6th graders enrolled in two schools using the same curriculum, one class being taught by traditional instructional methods, the other class with traditional methods supplemented with MSS graphic organizers. Writing samples were used to determine student achievement levels throughout the summer program.*

The educational system in the United States has come under scrutiny over the past several years. The enactment of the No Child Left Behind (NCLB) Act underscores the concern for the educational development of today’s students. This act calls for increased accountability from teachers and administrators with regards to the effectiveness of the learning techniques being used in various classrooms (U.S. Department of Education, 2006).

NCLB proposes to provide schools with financial support to address potential learning problems that could occur throughout our school systems. Annual yearly progress testing is viewed as a means of assessing performance and determines where help is needed; funding is directed to schools experiencing difficulties to be used for student development. Challenges to this new act point out a variety of difficulties in implementation, such as lack of funding as promised; testing which does not always reveal where problems in learning originate; assessment of core skill and content areas at the expense of learner engagement and second-tier knowledge of equal importance to success; and a lack of support by many teachers and administrators.

The need for effective teaching strategies to be used in conjunction with traditional text-based strategies has been demonstrated by recent test scores reflecting deficiencies in students' reading and vocabulary development in many middle schools. Use of Graphic Organizers is an example of a proven strategy which allows students to focus on specific concepts that will enhance the learning process. Ellis and Howard (2005) define Graphic Organizers as:

visual devices that depict information in a variety of ways. Most commonly, they employ lines, circles, and boxes, to form images which depict four common ways information is typically organized: hierarchic, cause/effect, compare/contrast, and cyclic or linear sequences. These images serve as visual cues designed to facilitate communication and/or understanding of information by showing how essential information about a topic is organized. (p.1)

My research evaluated the Makes Sense Strategies (MSS) model (Ellis, 2004), which employs Graphic Organizers. This technique was refined by Ellis and is based on three fundamental principles:

1. Students learn better when they are actively engaged in processing new information in meaningful ways.
2. Increasing the learn-ability of information or skills is preferable to dumbing it down.
3. Students should not waste time learning trivia. (Ellis, 2004)

Knowing how students process information is essential to understanding how teaching techniques can and should be developed. Certain students may need different or additional cues to understand certain concepts, depending on how that information is processed.

Teachers must become aware of students' prior knowledge when attempting to develop their usage of Graphic Organizers with students. The proper organizer can potentially help the student make connections between prior knowledge and new concepts. Ausbel (1963) believes that how learners represent knowledge (cognitive structure) has an influence on student learning. When the cognitive structure expands with the addition of new information, learning has taken place.

Ellis (2001) identifies three advantages of using Graphic Organizers: they make content easier to understand; they allow material to be addressed at more sophisticated levels; and they may enable students to become more strategic learners. Once the student gains an organizational structure for a given topic, his/her reading, writing, and communication skills are likely to improve with the use of Graphic Organizers. As organization begins to make content information easier to understand, Graphic Organizers allow future information to be addressed at more sophisticated levels.

The following discussion provides a description of the Makes Sense Strategies learning technique and demonstrates the variety of ways that Graphic Organizers can be used to aid students in the cognitive thinking process. We also compare and contrast traditional text-based learning techniques with Makes Sense Strategies.

The diversity of today's classrooms requires a great deal of planning by teachers. The various learning approaches and developmental difficulties teachers encounter place responsibility on the teacher to come up with strategies that will address this variety. Traditional text-based teaching styles frequently rely on students' memorization of facts while ignoring that many students do not understand how these facts may be relevant to a particular subject. To further compound the problem, many students begin middle schools and secondary content classes reading well below grade level. Learning disabilities, language barriers, and low skill levels are possible reasons for reading problems. Certain textbooks being used in content classrooms can further interfere with students' understanding the material, particularly when they lack prior knowledge of certain subjects.

McCoy and Ketterlin-Geller (2004, p. 89) noted that, "To help students challenged by heavy reading requirements in content classes, text related demands must be reduced without compromising the content"; breaking lessons up into smaller blocks of reading can be helpful. To implement this recommendation will require certain presentation changes that will incorporate different teaching strategies to address the diversity found in today's classrooms. This step must be accomplished while providing adequate instruction to all students.

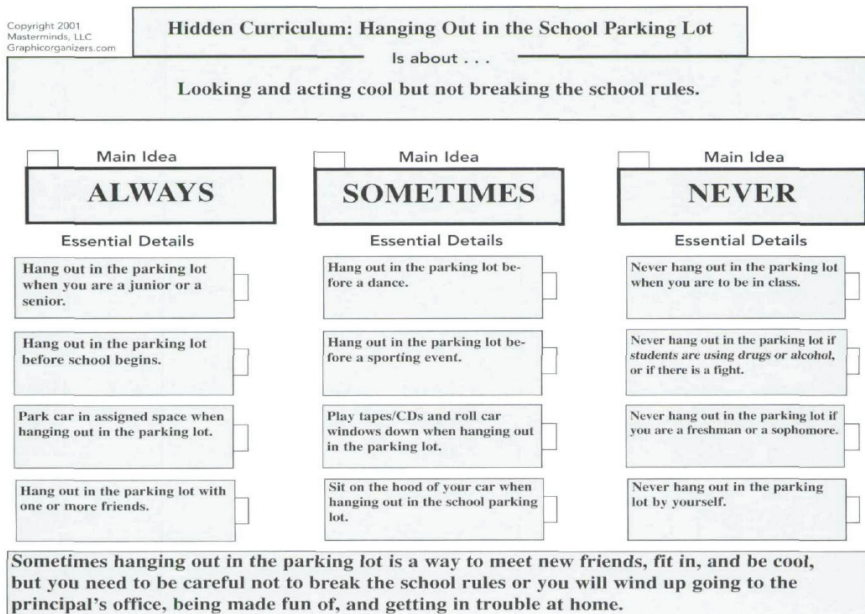
## Traditional Text-Based Learning

Research has shown that most textbooks are full of facts but do not reveal how the facts are linked together to develop knowledge forms (Jitendra, et al., 2001). As a result, teachers must assist the student in making these valuable learning connections. The teacher can determine what concepts are important to develop, then choose the proper Graphic Organizer to facilitate student learning. A “concept” is defined for this research as:

1. A broad class of objects or events bearing a unique label and spanning multiple instances and examples.
2. Attributes, i.e., those elements of the concept that fully describe the concept and separate it from similar concepts.
3. Examples and non-examples that illustrate the attribute relative to a specific instance. (Ellis, 2004)

The Graphic Organizer shown in Figure 1 demonstrates how a simple idea relevant to students can be translated into a series of ideas allowing students to describe familiar behavior or concepts and expand on those ideas when prompted with various questions.

*Figure 1.* Always, Sometimes, Never concept (MSS CD copyright 2006). Reprinted with permission.



The instructor must identify the defining attributes for the concept. The attributes must then be generalized into a variety of instances related to the concept being discussed. Teachers must select Organizers that allow students to use their prior knowledge to expand into other areas through generalized ideas that cross over to various related concepts and ideas. If students know how to drive a car, then they may be able to discuss how to fly a plane. One's basic knowledge of driving a car can be generalized to the step-by-step process of flying a plane.

### **Makes Sense Strategies**

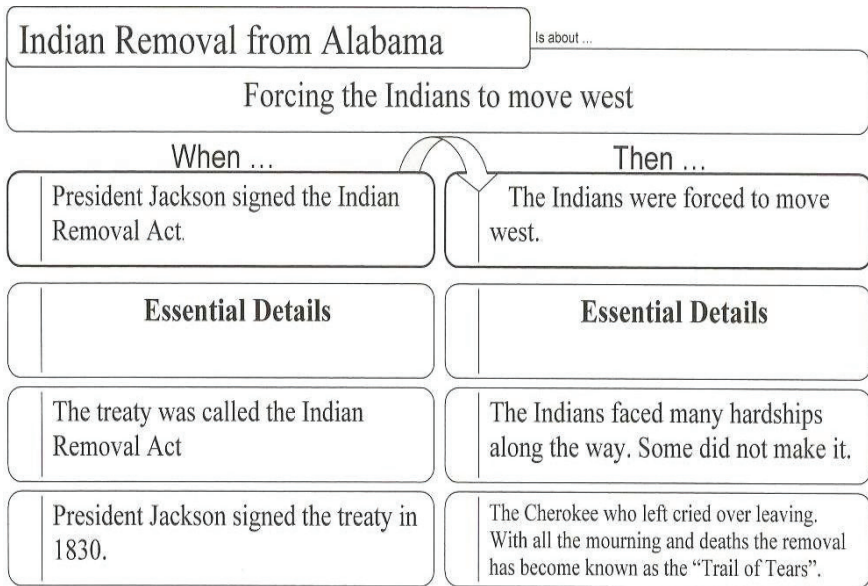
The MSS model provides a variety of techniques and tools that allow teachers to differentiate curriculum, plan and implement instruction, and review student learning. MSS attempts to increase the clarity of information that teachers expect the students to learn, making sure students understand the goal of the lesson that is being presented. MSS makes the steps to a strategy explicit and memorable (Ellis, Farmer & Newman, 2005, p. 1). Allowing for differentiating curriculum provides flexibility for teachers when dealing with the diverse student population of most schools.

The MSS method does not attempt to be a stand-alone teaching method. It is designed to work in conjunction with other developmental strategies. Based on a student's cognitive abilities, teachers must develop strategies that address individual student needs. Yet curriculum must not be diluted by simplifying instruction and leaving out challenging concepts, assuming the student will not understand.

The Makes Sense Content Strategies feature an array of specific think-sheets and instructional strategies for teaching BIG IDEAS and essential details (Ellis, Farmer, & Newman, 2005, p. 34). Think-sheets provide cues for teachers as to what is important about the concept being taught and allow students to use elaboration relying on prior knowledge to understand the concept.

In Figure 2 below, the "big ideas" are listed above the essential details boxes. The step-by-step development of the information allows the student to discuss cause and effect features and provide important elaboration that are a part of the big ideas.

Figure 2. Cause and Effect concept (MSS CD copyright 2006). Reprinted with permission.



### Graphic Organizers and Fluency

Graphic Organizers give teachers the opportunity to illustrate the structure and organization of information. The visual displays that are a part of Graphic Organizers allow students to link prior knowledge to new learning, which leads to a deeper level of understanding for the student. While the facts are important, understanding the concepts related to the facts can enhance the learning process for many students.

In a study of reading fluency and self-efficacy, Ferrara (2005) found that students' perceptions of how well they feel they can accomplish certain reading tasks will influence how new information will be processed. An attempt to establish student perceptions of their learning curve can aid the teacher in developing strategies to help students gain confidence in their innate ability. The researcher, Sandra Ferrara, received valuable feedback from the student involved in her research as to how the student felt about her reading progress. This allowed the instructor to adjust her teaching strategies in accordance with the student's level of confidence.

## **Schema**

Schema theory is another very important aspect of understanding the learning process. Schema theory states that memory is composed of a network of interrelated cognitive structures called schemas. “A schema is a knowledge structure that accompanies or facilitates a mental process” (Winn, 1996, p. 2.). Schemas essentially contain the sum of a student’s knowledge. They are how students organize and process information. Formation of schemas comes through making generalities, not simply acquiring specific information. Schemas allow students to link prior knowledge to new incoming information. Graphic Organizers can aid the student in this relational process. For example, if you have to borrow your neighbor’s lawn mower to cut your grass, you have to rely on your general knowledge of lawn mowers to understand how to operate a lawn mower you have never used before, linking your prior knowledge about lawn mowers to understand how to operate your neighbor’s lawn mower.

## **Research Focus**

Our hypothesis in this research was that use of the MSS model using Graphic Organizers would lead to an increase in vocabulary over time. An increase in vocabulary is not measured only by the number of words used. How students organize their thoughts in a sequential, easy-to-understand pattern represents a part of vocabulary development. Grammar and spelling must be factored in as well. Our research used Graphic Organizers to help students draw on prior knowledge to understand new information, thus giving students the basis needed to broaden their abilities to express themselves.

## **Methodology**

### **Participants**

Our research took place at two public middle schools as a part of the school-based programs of Tuscaloosa’s One Place (TOP), A Family Resource Center in Tuscaloosa, Alabama. Supported by federal grants, TOP coordinates outside support to schools within the area. Hillcrest and Lloyd Wood Middle Schools had summer sessions of half-days for five weeks, designed to improve the transition of learners from self-contained, elementary school days to period-to-period transitions in middle school by addressing organizational and coping skills. We worked with 5th graders

who would be moving into the 6th grade in the new academic year. The program provided additional transitional training for those interested; attending this summer program was on a voluntary basis.

## **Procedures**


Two days per week, an hour each day, we presented to 22 students in two classes at Hillcrest Middle School various content Graphic Organizers, to assist students in vocabulary development. The curriculum for this program was designed to help students in social skills development. Anger management, peer pressure, and becoming a leader were topics that we discussed during class time. Two classes at Lloyd Wood studying the same content but without using Graphic Organizers comprised a control group. Both the experimental and the control group received daily instruction in English, Science, and Math.

## **Measures**

A writing sample pretest was given to students from both schools, to determine initial student vocabulary levels, so that appropriate think-sheets were selected for the Hillcrest students to address any potential developmental problems, and as a baseline for assessing change over the five-week period. After two weeks, we administered another test to check progress and develop additional think-sheets. A final writing sample was taken to review overall progress. An abstract painting of a horse race was used to generate the writing sample. The students were asked to simply write or describe what they saw in the painting. They were given 15 minutes to respond.

In the writing samples collected, for students in the experimental and control group, we tracked the number of words used, depth of knowledge, ability to organize thoughts, neatness, and grammar. Figure 3 shows the rubric used to measure organization of thoughts, depth of knowledge, grammar, spelling, and neatness. As shown, students were assigned one to four points in each area, depending upon the quality of their writing sample. The numbers of words comprising each sample were also counted to yield an additional measure of writing fluency.

Figure 3



### Rubric Analysis

	Criteria				Points
	1	2	3	4	
<b>Organization</b>	Sequence of information is difficult to follow.	Reader has difficulty following work because student jumps around.	Student presents information in logical sequence which reader can follow.	Information in logical, interesting sequence which reader can follow.	—
<b>Content Knowledge</b>	Student does not have grasp of information; student cannot answer questions about subject.	Student is uncomfortable with content and is able to demonstrate basic concepts.	Student is at ease with content, but fails to elaborate.	Student demonstrates full knowledge (more than required).	—
<b>Grammar and Spelling</b>	Work has four or more spelling errors and/or grammatical errors.	Presentation has three misspellings and/or grammatical errors.	Presentation has no more than two misspellings and/or grammatical errors.	Presentation has no misspellings or grammatical errors.	—
<b>Neatness</b>	Work is Illegible	Work has three or four areas that are sloppy.	Work has one or two areas that are sloppy.	Work is neatly done.	
				<b>Total----&gt;</b>	—

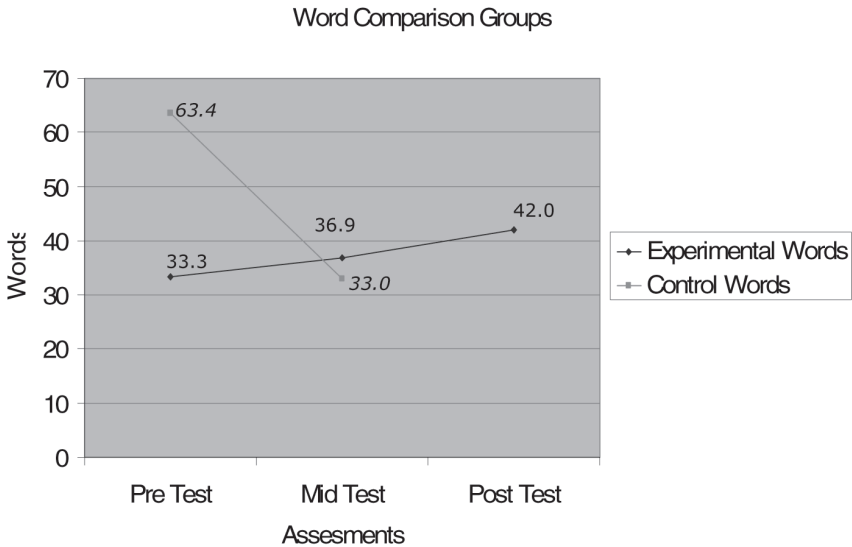
### Results and Discussion

Due to a lack of funding from the county schools that resulted in premature termination of the program at Lloyd Wood, we were unable to administer the final posttest to the control group. Our comparison of the two schools was thus based on the pre- and mid-tests, where we were able to draw conclusions to support our research hypothesis.

In Figure 4 we see the comparison between the two groups for numbers of words used. On the pretest, the average number of words used by the experimental group was 33.3 words; the control group averaged 63.4 words. The academic backgrounds of the two groups of students may have had an effect on the differences in their initial average scores, but relevant information was not available to the researchers.

Figure 4

# Word Comparison



Mid-test scores show a modest increase up to an average of 36.9 words for the experimental group, while the control group decreased to an average of 33 words. As discussed previously, when Graphic Organizers are used in conjunction with traditional text-based instruction, students are afforded the opportunity to use their elaboration skills to discuss topics based on their prior knowledge, while also grasping an understanding of new information. The control group's decrease in average words suggests that the students were not engaged in a manner that maintained their interest in the topic. When using think-sheets, students are asked to write about what they already know about a specific topic based on the cues provided on the various think-sheets, which appears to promote independent thinking.

While we do not have a post-test comparison for the groups, we do see that the experimental group again had an increase, up to an average of 42 words, a 26% increase in average word usage from the pre-test. Over time, when used on a consistent basis, Graphic Organizers will increase word usage.

Figure 5

## Experimental Group

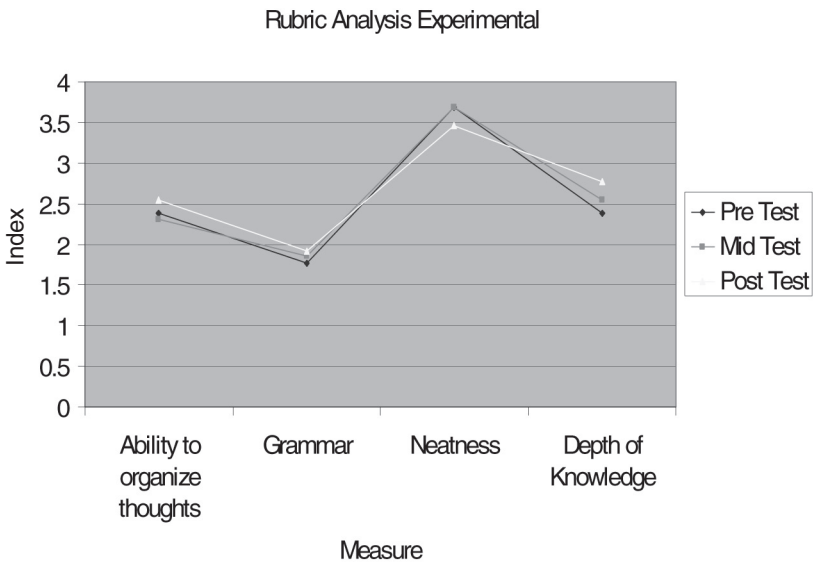


Figure 5 shows the measurement results from the experimental group. In the categories of ability to organize thoughts and depth of knowledge, we see an overall improvement in both areas; coupled with the increase in word usage, these improvements indicate students were gaining a better understanding of what they were writing about. Organizing their thoughts in logical sequences allows the reader to follow the students' writings without being confused.

Figure 6

# Control Group

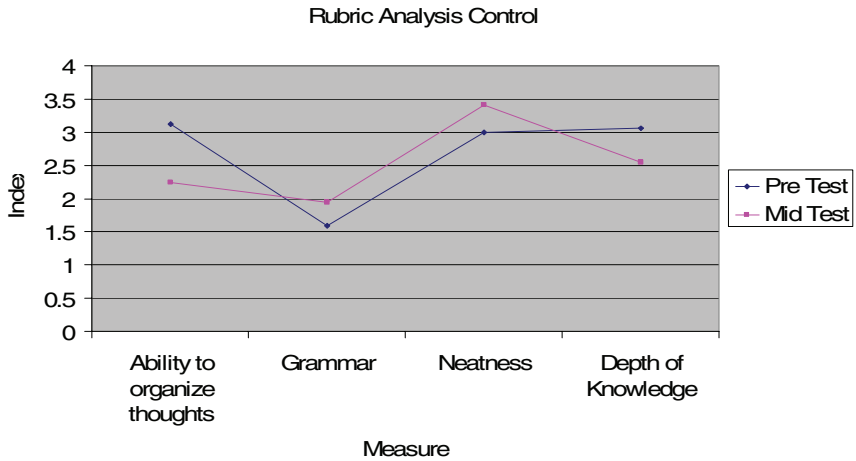


Figure 6 shows the results for the control group. In the categories of ability to organize thoughts and depth of knowledge we see decreases in both areas from pretest to mid-test. Here again we feel that the lack of student engagement due to the absence of think-sheets led to the decrease in these areas.

Figure 7

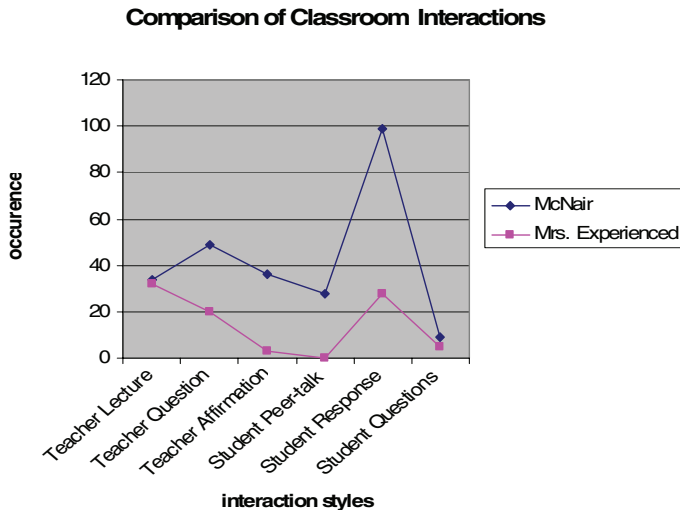


Figure 7 reveals the impact the think-sheets can have on teacher performance when interacting with students. My faculty mentor (second author) throughout this research monitored student-teacher interaction during class time for the experimental and control groups. He tabulated data related to the interaction styles listed in Figure 7. Although an inexperienced teacher, through the use of appropriate think-sheets, I (first author) was able to interact with students at a higher level than “Mrs. Experienced” teacher, that is, the more experienced teacher instructing students in the control group. Of particular interest are the student responses in class for “Mrs. Experienced,” 28 in contrast to 99 responses for me. The imbedded cues within think-sheets prompt the teacher to ask questions designed to garner responses from the students, thus facilitating student participation that will point out to teachers where students may or may not need help.

In summary, we have shown that using proper Graphic Organizers will aid students in developing a solid understanding of various concepts and afford them the opportunity to express their understanding based on what they already know and to organize their thoughts in a logical sequence. Our results are for a 5-week period. Working with students for an entire school year with this learning technique would allow vocabulary development that clearly exceeds the growth found in students exposed to textbook training only.

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