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Pictorial Map Effects on Learning How to Summarize

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PICTORIAL MAP EFFECTS ON LEARNING HOW TO SUMMARIZE

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Dissertation Abstract

Pictorial Map Effects on Learning How to Summarize

Inadvertent plagiarism among college students is caused by misunderstanding the rules and expectations about how to summarize source passages. Visual instruction in the form of a pictorial map is one way to address this problem and to teach students how to properly restate source text. Sixty-six college students from two universities participated in a quasi-experimental study in which an experimental group used a pictorial map instructional strategy and a control group used an underline/circle text instructional strategy to write summaries. The results showed that students in the pictorial map group wrote significantly better quality summaries for both high-interest politics passages and low-interest ballet passages. The findings were interpreted as support for a new hybrid visual strategy that uses journalism questions, images, linking lines, and partially blank labels to help students comprehend text and restate the main ideas in their own words and writing style. This study contributed to the learning and instruction literature by providing empirical evidence that a visual (pictorial map) tutorial was more effective than a verbal (underline/circle text) tutorial for summarizing paragraph-length passages.

This dissertation, written under the direction of the candidate's dissertation committee and approved by the members of the committee, has been presented to and accepted by the Faculty of the School of Education in partial fulfillment of the requirements of the degree of Doctor of Education. The content and research methodologies presented in this work represent the work of the candidate alone.

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CHAPTER ONE

STATEMENT OF THE PROBLEM

Copying text directly from an original source into a school paper has been a problem discussed extensively in research literature for the past 50 years. Surveys of high school populations spanning 30 years (1969, 1979, 1989) have found that an average of 74 percent of students admitted to copying information word-for-word from books into their assignments (Schab, 1991). A survey of 2,200 undergraduates from 21 campuses reported that 40 percent copied entire sentences from sources without using any citations (McCabe, 2001). This proclivity for copying text, in addition to committing other blatant forms of plagiarism, has generated many theories and studies about academic dishonesty, lax standards, and ineffective administrative policies (e.g., May, Campbell, & Doll, 2000).

Some recent studies, moreover, have focused on another troublesome form of copying text: inadvertent or accidental plagiarism (e.g., Feldman, Anderson, & Mangurian, 2001; Harris, 2002). This writing problem appears to be rooted in the widespread confusion among students about academic standards and expectations. A number of empirical studies have shown a significant correlation between students' misunderstanding of summarization and paraphrase rules and the frequency of inadvertent plagiarism (e.g., Roig, 1999, 1997). Soto, Anand, and McGee (2004) found that college students who received instruction on citation rules were significantly less likely to plagiarize than students without formal instruction. However, instruction on recognizing citation errors does not teach students how to properly restate the source passage without using its original wording (Landau, Druen, & Arcuri, 2002).

In a study involving 2,829 college students who completed an online tutorial on plagiarism, citations, and paraphrasing, Jackson (2006) discovered that only 24.4 percent recognized when a paraphrase followed the wording of the original text too closely. In addition, when students were asked to restate a source passage, they frequently copied the same language, simply rearranged sentences, and omitted important ideas from the original. Jackson concluded that many students never learned they first had to understand the main ideas of a passage before they could properly restate them in their own words. In contrast, other research has found that instruction requiring students to practice how to correctly restate text was much more effective in teaching comprehension skills that deter them from inadvertently copying the source text (Roig, 1997; Roig & DeTommaso, 1996; Schuetze, 2004).

The currently published instructions for paraphrasing and summarizing range from brief guidelines to extensive self-paced tutorials that provide rules and procedures for college students. Many of these popular tools can be downloaded for free from the websites of trusted educational organizations (e.g., ReadWriteThink, Thinkfinity), established textbook publishers (e.g., Pearson Education, Bedford/St. Martin's Press), and universities (e.g., Purdue). Typically, the instructions ask students to underline, circle, or highlight the main ideas of a source text and then follow a few simple steps to formulate a restatement (see Appendix A). These tools do not consider level of interest or subject matter knowledge in the source text as possible scaffolds for engaging students in the reading and writing process (e.g., Guthrie & Wigfield, 2000).

Interest, however, is considered an important variable in motivation that refers to the psychological state of engaging in or being predisposed to reengage with particular

objects, events, or ideas over time (Hidi & Renninger, 2006). The research (e.g., Schraw, Flowerday, & Lehman, 2001) covers two types of interest: situational and personal (or individual). Situational interest is described as spontaneous and environmentally activated that relates to catching students' focused attention (e.g., Krapp, 2002); in contrast, personal (or individual) interest is a relatively enduring state that is activated internally and pertains to holding attention (e.g., Hidi & Baird, 1986; Mitchell, 1993; Schiefele, 1999, 2001).

Situational interest has an emotional level that triggers a strong affective response to text and a cognitive level that engages students in text, especially when the text relates to prior knowledge (Kintsch, 1980). The reading research concludes that interesting information has a greater influence on comprehension than less interesting information (e.g., Alexander & Jetton, 1996; Schraw & Dennison, 1994; Schraw & Lehman, 2001). However, the relationship between high interest and low interest in a source text and one's ability to summarize the text remains unexamined in the research. In addition, some interest studies examine how special conditions affect learning, such as puzzles (e.g., Cordova & Lepper, 1996; Mitchell, 1993) and images (e.g., Goetz & Sadoski, 1995). This experiment therefore focuses primarily on the potential differences in effect between a high-interest and a low-interest source text on summary writing. Moreover, it is possible that a pictorial map, which also is introduced as a new way to summarize text, may provide another situational interest condition to this investigation.

Considering the extensive research on the prevalence of inadvertent copying (e.g., Feldman, Anderson, & Mangurian, 2001; Harris, 2002; McCabe, 2001), and the ongoing developmental problems of college students in restating original passages (Richardson & Morgan, 2005), it was surprising to this researcher that these popular instructional tools all

fundamentally use a similar approach. The basic procedure for college-level instruction simply directs students to read and reread an original text passage until it is understood, and then to underline or circle the main ideas before writing a summary. Typical instruction, based on a review of more than 20 tutorials, does not provide scaffolding adjuncts, such as the key journalism questions (who, what, where, when, why, how) found in some primary and high school materials (see Appendix A), that help college students to identify the main ideas of a source passage.

The omission of the journalism questions as a scaffolding strategy appeared to this researcher to be a weakness of college-level instruction. Journalism questions form the basis of the inverted pyramid style of writing developed by news reporters to convey major points quickly. This principle of writing states that the most important point of an article should begin at the top, followed by the next most important point, and so on, in an order of diminishing importance. The most critical information is given to the reader first. Using these same journalism questions at certain intervals or stopping points while reading a source passage would be the corollary technique for students to identify and organize main ideas (e.g., Herrell, 2000). In light of the reading research on scaffolds (e.g., Clarke, Flaherty, & Yankey, 2006) and the benefits of using journalism questions, the typical practice of simply rereading and marking-up text in summary writing is inadequate.

In a quality summary, the main ideas of a source passage should be expressed in one's own words and devoid of any copied word strings or synonyms that simply replace the original wording (e.g., Bransford, Brown, & Cocking, 2000). The first critical step in writing an accurate summary is to clearly recall and comprehend the main ideas of the original text. The writer must then decide what information should be included, deleted,

reworded, and reorganized, while also ensuring the original meaning is represented accurately.

Research has indicated that visual strategies improve reading recall and comprehension more than non-visual strategies (e.g., Carney & Levin, 2002; O'Donnell, Dansereau, & Hall, 2002; Sadoski, 2005). In addition, the research has found that partially worked-out examples can scaffold learning (e.g., Schnotz, 2002). However, no experimental study to date has tested whether a visual strategy in the format of a partially completed pictorial map will help college students make these critical decisions (i.e., what to include, delete, reword, reorganize) that lead to writing a quality summary.

Background and Need

This study was developed from four distinct yet closely aligned areas of research: (1) summarization problems, (2) reading comprehension benefits in summary writing, (3) topic interest effects on processing text, and (4) visual instruction in summary writing. The findings and gaps in these related areas provided the background justification for examining this specific research question: Does the visual instruction format of a pictorial map improve one's ability to comprehend a source passage and thus produce a better quality summary than instruction using the verbal format of underling/circling text?

Summarization problems

Many college students are befuddled by the academic standards and expectations for writing quality summaries and paraphrases (Feldman, Anderson, & Mangurian, 2001; Harris, 2002). A number of recent studies have correlated this misunderstanding with inadvertent plagiarism (e.g., Ercegovac & Richardson, 2004; Roig, 1997, 1999, 2001). In a

series of empirical studies, Roig (1997, 1999, 2001) found that students believed plagiarism in paraphrasing and summarizing was a simple problem of not acknowledging the author of a passage rather than failing to restate the text in their own words. By not properly restating the original text, students committed many subtle forms of plagiarism. For example, they would lightly revise passages that remained too close to the original wording, merely reposition or change a few words, or retain the author's original voice and sentence structure. Roig concluded that most college students plagiarized inadvertently because they were simply unaware of the rules for properly restating original text. This widespread misconception provides the broad context in which plagiarism and one's ability to restate text share common ground in summarization research.

As the complexity of the source text passage increases, noted Roig (1999), students are more prone to merely rearrange the text and keep in tact most of the original language and sentence structure. Interestingly, Roig also reported that one's ability to properly restate text did not improve with more academic experience (i.e., higher grade levels). In fact, he found that college seniors performed more poorly than all other grade levels and sophomores scored the highest of all levels on tests that measured their paraphrasing ability. Roig did not speculate about the reasons for these inconsistent results, but other researchers (e.g., Bransford, Brown, & Cocking, 2000) have found that the structure inherent in the source passage contributes to the difficulties students experience in their attempt to summarize accurately. Frequently, for example, the main idea of the source passage, especially in the expository texts of many college courses, is implicit and not readily apparent in the first sentence or the surface structure of a complex passage.

Roig (2001) further contended that students' problems in being able to restate text were at least partially due to the inconsistent modeling and instruction by their professors. Using survey data from his 1999 study, Roig found that 44% of the professors had mistakenly identified the plagiarized passages of their students as correctly paraphrased, and 33% of the professors who were asked to paraphrase the same paragraph as their students also had copied five to nine text strings (i.e., two to three words or more in a sequence) directly from sources. Roig therefore surmised that a significant number of academics considered restating text in one's own words to be only a subtle feature, rather than a requirement, of proper summarizing and paraphrasing. The reasons for these false assumptions and poor teaching practices, Roig further suggested, were due to the absence of operational standards to guide students on the number of original words that may be retained for an acceptable restatement. Although textbooks and reference guides in composition courses emphasize restating original text in one's own words and writing style (e.g., Aaron, 1998; Clines & Cobb, 2006; Hacker, 1994; Harris, 2001; Troyka, 1999), the major style guides on research writing used in other college courses provide little guidance for students and instructors. The disparity among these widely published guides, coupled with the apparent increase in plagiarism, points to the need for further investigation.

Of the three major style guides on research writing in the academic domains, none provides specific operational standards. The current edition of *The Publication Manual of the American Psychological Association* (APA, 2010) does not discuss summarization but gives the following instructions on paraphrasing: "Summarize a passage or rearrange the order of a sentence and change some of the words" (1.10, p. 15). This loose definition permits generous interpretation, as well as introduces potential confusion between

paraphrasing and summarizing, especially when compared to the more definitive textbook descriptions that detail the writing standards. The other two primary style manuals for research (i.e., MLA and Chicago Manual) offer even less instructional guidance than the APA manual. The only statement on summarizing in the *MLA Handbook for Writers of Research Papers* (2009) concerns its basic function: "Summarize if you want to record only the general idea of large amounts of material" (1.7.2). Similarly, *The Chicago Manual of Style* (2010) offers only a simple caution on the extensive use of paraphrasing as a research writing style that may be interpreted as an excuse for "merely disguised copying" (4.82). Although it may be argued that the intent of these style guides is not to provide detailed instruction, the lack of information and cross referencing to other sources for the requirements in a proper restatement of source text is problematic. This situation may contribute to the misinterpretation of standards among students and teachers who rely on these authoritative guides in courses often far removed from a basic composition class.

In contrast to the major style guides, many composition manuals (e.g., Aaron, 1998, Hacker, 1994; Troyka, 1999) clearly discuss the parameters for a quality summary (and paraphrase) and define the extent to which a source text must be modified in an acceptable restatement. According to Aaron (1998) and Troyka (1999), for example, the source must be *completely reworded* using one's own sentence structure, and the restatement *cannot include just a few changed words*. These requirements for an acceptable restatement are strictly interpreted by Howard (1999) as well, who states that plagiarism still occurs if one simply deletes a few words, alters some grammatical structures, and substitutes synonyms.

Reading Comprehension Benefits in Summary Writing

For a passage to be summarized properly, the most important ideas in the source text must be condensed and restated in one's own words and style. The student needs to select or infer the topic sentence, remove redundant or trivial information, integrate details, and combine and prioritize related ideas (Brown & Day, 1983). This initial reading comprehension process provides valuable payoffs for summary writing. Summaries indicate reliably that students understand information at a deeper level than would be apparent from simply reading and rereading text. When students write summaries, new material must be integrated within their existing memory representations (i.e., schema) of what they are reading (Bransford, Brown, & Cocking, 2000; Brown, Bransford, Ferrara, & Campione, 1983; Brown, Day, & Jones, 1983; Dole, Duffy, Roehler, & Pearson, 1991; Pressley & Woloshyn, 1995). Even rereading a passage for meaning is typically a rather passive cognitive activity when attempting to produce an accurately written restatement. Rereading does not require as much conscious thought, judgment, and effort as a more active engagement with the text (Kintsch, 1998; van Dijk, & Kintsch, 1983). Research indicates that summary writing requires coordination with reading comprehension skills to a degree that few other academic tasks demand (e.g., Tierney & Shanahan, 1991). When the cognitive links are established between the reading comprehension and summarization processes, students can then apply their newly acquired learning to solving problems, supporting arguments, making thoughtful contributions to class discussions, and sharing their understanding with colleagues (Mannes & Kintsch, 1987; Bean & Steenwyk, 1984; Casazza, 1992; Kintsch & Kintsch, 1997; Taylor & Beach, 1984).

Unfortunately, researchers also agree that poor summarization skills persist from high school through college years (e.g., Brown, Bransford, Ferrara, & Campione, 1983). Early studies (e.g., Garner & McCaleb, 1985; Hill, 1991) indicated that as many as 50% of college students lacked the language resources to generate enough original sentences for accurately summing up a source passage in their own words. A more recent study by Wade-Stein and Kintch (2004) concluded that the major reason summarization ability develops so slowly is the lack of opportunity for students to actively practice the process. Summary practice alone, however, is not enough to significantly improve summarizing skills. Students also must receive a sufficient amount of targeted feedback from their teachers and peers, as well as learn from good instructional tools to increase and optimize their skills (Paris, Wasik, & Turner, 1991).

Given the many payoffs noted in the research about summary writing, an intriguing question remains: Why is this valuable skill so often neglected in education? This impasse may be partially due to the intrinsic complexity of the summarization task itself. Many students have difficulty in determining the core meaning of an expository passage, especially when the gist of the text is not obvious from the surface structure (van Dijk & Kintsch, 1983). Subsequently, the cognitive process to convert the surface structure into a summary becomes demanding. Teachers, in turn, may find it daunting to provide enough useful feedback, feel uncertain about how to facilitate instruction, and tend to focus on only a few specific operations in the summary process (Friend, 1987). The overwhelming amount of work and time required for educators to adequately teach students how to summarize was reported by Wade-Stein and Kintsch (2004) as the major reason for a lack of formal instruction.

It seems that an instructional treatment capable of overcoming barriers in extracting main ideas from a source passage to write a summary would also addresses the related and broadly acknowledged problems of inadvertent plagiarism, as previously noted. The research, not surprisingly, has established a strong correlation between formal instruction on how to recognize and avoid plagiarism and the lower incidence of plagiarism among college students (Harris, 2002; Soto, Anand, & McGee, 2004). For instance, Soto et al. (2004) reported that students with formal instruction plagiarized half as often as uninstructed students who often wrote hybrid sentences cobbled together with words and other phrases copied directly from source documents. However, the correlation between instruction on recognizing plagiarism and instruction on writing a summary comes more into focus with Jackson's (2006) recent research. In her study of 2,829 students at San Jose State University, Jackson (2006) found that students who had formal plagiarism instruction and scored in the 90th percentile in being able to *define* plagiarism still could not correctly *describe* an acceptable restatement (paraphrase or summary). The students in Jackson's study continued to believe that an acceptable restatement merely involved the superficial strategy of replacing some words from the original text with synonyms rather than completely restating the source text with their own words, writing style, and voice.

Many recent empirical studies (Barry, 2006; Jackson, 2006; Roig, 1997; Roig & DeTommaso, 1996; Schuetze, 2004; Walker, 2008) found that instruction in learning to restate an original text in one's own words is significantly more effective than instruction in recognizing plagiarism to prevent students from plagiarizing in future assignments. In fact, Barry (2006) noted a significant correlation between students who actually learned how to paraphrase correctly and their increased understanding of how to avoid inadvertent

plagiarism. Barry's empirical study also differed from other studies (e.g., Lanau, Druen, & Arcuri, 2002) with her emphasis on the importance of students who *practiced* how to restate source text so they could become more proficient in the initial steps of critical thinking. This experiment was therefore situated within the parameters of these related studies (Barry, 2006; Jackson, 2006) and intended to test the effectiveness of an instructional strategy (i.e., pictorial map) that would improve a student's understanding of main idea units and their contextual relationships during the initial reading phase of the summary writing process.

Topic Interest in Processing Text

Students achieve better reading outcomes when they are actively engaged in processing the text (e.g., Guthrie & Wigfield, 2000). Two ways of engaging readers are topic interest, which may be defined as a relatively stable orientation brought to a context or content domain, and subject-matter knowledge. College students who possess more knowledge about the content, according to Alexander, Kulikowich, and Schulze (1994), have higher topic interest, leading to better recall and comprehension. Other studies (e.g., Schiefele & Krapp, 1996) also have found that topic interest significantly affects the recall of ideas but does not necessarily correlate with prior knowledge. Considering these reliable and positive effects of interest on reading outcomes, two passages categorized by interest levels were used for this experiment. This researcher selected politics as the high-interest topic and ballet as the low-interest topic based on earlier pilot studies with similar subjects (see Appendix B). This experiment extended the research in topic interest by

exploring how these interest levels would affect reading comprehension as the first step in writing a quality summary.

Most interest studies distinguish between situational and topic interest (e.g., Alexander, 1998; Hidi, 2000; Hidi & Baird, 1986; Schiefele, 1996; Tobias, 1994). This distinction is important in light of the second research question related to the main effects between a source text and topic interest in the summarization process. Situational interest is generated by certain factors such as novelty or intensity that contribute to the immediate interest of a situation. Mitchell (1993) proposed a model of interest in which situational interest has two components: catching and holding. Catching involves finding ways to stimulate or spark interest, while holding involves successfully maintaining the activity and empowering students. Although Mitchell's study focused on math students and examined catching mechanisms such as puzzles, mind-teasers, and starters, the pictorial map was assumed to function in a similar way by catching the situational attention of readers, especially those with low-topic interest. Topic interest is a matter of degree, suggested Boscolo and Mason (2003), which may vary according to situationally interesting parts of a given text. Therefore, if a pictorial map filled some information gaps in understanding the text, it also may act as a motivational bridge encouraging students to make more inferences to better understand a passage and thus hold their interest while restating the text in the summary process.

Visual instruction in Summary Writing

The research in visual instruction has found that graphical and mapping elements emphasize interrelated concepts and ideas in a text passage (e.g., Chmielewski & Dansereu,

1998; McCagg & Dansereau, 1991). This emphasis, in turn, leads to better recall and comprehension of ideas. This tutorial on summary writing used a visual format (i.e., pictorial map) to scaffold the initial cognitive processing for students to better comprehend the knowledge structures and contextual relationships of a source passage. The pictorial scaffolding represented an alternate approach to more typical college tutorials in summarization that use text-only approaches (i.e., control condition). The pictures illustrate the idea units of a source text and allow students to retrieve and construct their own schema relevant to what they have read (e.g., Chimielewski & Dansereau, 1998). In addition to viewing a pictorial map, students filled in partially completed labels of the pictures and linking lines, reinforcing the recall and comprehension of details and concept relationships for the purpose of restating the passage in their own words. The simple fill-in-the-blanks pictorial map was a visual scaffold for students to easily follow. The pictorial scaffold also accommodated various reading levels, summarization abilities, differing interests and prior knowledge in the source contents, and learning style preferences.

In regard to graphical strategy, this researcher relied on four key empirical studies to support the use of partially completed pictorial maps. Yin, Vanides, Ruiz-Primo, and Ayala (2005) found that undergraduates who were given concepts from a passage, and then constructed a map with their own linking phrases, had better conceptual understanding of the knowledge structures than when they were given both the linking phrases and concepts, and had to select and assemble them on their own. Yin et al. further recommended that students should construct map propositions limited to the 10 most important or meaningful ones to minimize cognitive load in processing too many propositions at the same time.

According to Chang, Chiao, Hsiao, and Chen (2000), learners who began with a partial solution of a concept map and gradually completed all the steps to arrive at a full solution learned more effectively because partial solutions acted as a bridge to engage learners and reduce cognitive load. Chang, Sung, and Chen (2002) reported that students using concept maps, which were either 40% completed or intentionally erroneous and needing some corrections, scored significantly better in reading comprehension tests than students in a treatment condition without a scaffolding or completion strategy to identify and connect the key concepts. Furthermore, a study by Katayama and Robinson (2000) confirmed that partially completed graphic organizers significantly improved reading comprehension more than skeletal graphic organizers (i.e., no text labels for concepts) because skeletal organizers required more effort to complete and therefore contributed to cognitive overload. These findings, along with other research in the literature review section, supported this researcher's rationale to use partially completed labels for idea units (i.e., proposition objects) and corresponding relationship lines in the pictorial maps.

The following sample paragraph (see Figure 1) represents a typical expository passage used for teaching summarization skills to college students. The paragraph is comprised of idea units organized by the six standard journalism questions: Who? What? Where? When? Why? How? For example, the commissioners, tourists, and consulting firm in the passage are identified as the "who" elements. The economic forecast and upcoming budget are the "why" constructs (i.e., reasons for the commissioners to act). Similarly, the passage also contains other idea units that answer the questions of "when?" "where?" "what?" and "how?" and have a logical relationship with each another. As with many college-level expository passages, the main ideas of the sample passage are not stated

explicitly in the first sentence, and a student must infer them from studying the paragraph, and then classifying and prioritizing ideas to arrive at a generalization that captures the gist of the entire passage (e.g., Friend, 2001).

The commissioners of the state's tourism and economic development agency, including some newly elected members and many veteran officials, met early Thursday at 8 a.m. at the old courthouse downtown. In their initial and tense deliberations they discussed and then hotly debated a common problem that is seriously impacting their confidence in making their economic forecasts for the upcoming fiscal year. The state of Arkansas, according to several independent national surveys, has a dreary image in the minds of many tourists who have never visited the state. This negative perception is a huge hurdle that these politicians feel incapable of understanding on their own and they decided to first hire an expensive consulting firm from New York to research and compile a report within one month for further study and analysis before they can move forward with their budget recommendations.

Figure 1. Typical expository passage to be summarized.

Following a typical expository passage in the visual treatment is a sample pictorial map (see Figure 2) that illustrates how idea units are pictured and joined by directional arrows labeled with linking words or phrases (i.e., proposition predicates). For example, the commissioners (i.e., the "who?" idea) had met because they needed to make an "economic forecast" and recommend a "budget" (i.e., the "why?" idea) that accounts for the negative perceptions of tourists. These two connected ideas form a relationship depicted by the linking word "need."

In general, the linking words (such as "need") are classified into one of three major categories: dynamic, static, and elaborative links. A dynamic link denotes a changing condition between elements or ideas (i.e., a cause-and-effect relationship). For example, the research and reports in the sample paragraph are needed, or would be the cause, for the production of a better forecast and budget. A static link describes a structural relationship

between ideas or objects (i.e., part of a whole). The budget, for instance, has a one-month due date, or stated differently, the one-month due date is a key *part* of the budget. Finally, an elaborative link extends the meaning of an idea or object (i.e., an example of something). The dreariness of Arkansas, for example, is an extension of the thinking or perception of how tourists view the state. The entire map—images, labels, lines (arrows)—forms a clear visual integration of pictures and relationships that allows students to see the connections among the idea units (i.e., propositional schema) and, in turn, may facilitate the students' comprehension of the main ideas.

Research extensively supports the cognitive benefit of pictorial components in mapping. Studies on how pictures significantly improve reading comprehension include early empirical investigations by Holmes (1987) with 5^{th}-6^{th} graders and Waddill and McDaniel (1992, 1993) with college students who had different reading levels. David (1998) and Zillman, Knobloch, and Yu (2001) also reported improved recall effects among undergraduates who read news articles illustrated with photos.

Cognitive learning theory supports the reasons for a pictorial map improving one's ability to comprehend and summarize a source passage (e.g., Mousavi, Low, & Sweller, 1995). In this experiment students were asked to view a pictorial map with partially completed blanks representing idea units in the source passage. Students then filled in these partial blanks with words identifying constructs or relationships (e.g., "c_____" means "c<u>ommissioners</u>"). This cognitive engagement with pictures, mapping, and partial labels was intended to facilitate the students' retrieval and construction of associated schemas from long-term memory, help them attend to details, and comprehend the relational ideas of the source passage (e.g., Chang, Chiao, Hsiao, & Chen, 2000; van

Merrienboer, 1990; Waddill & McDaniel, 1992, 1993). By tapping into a student's unique cognitive architecture and related experiences through a combination of pictures, maps, and labeling, the inclination to copy words, phrases, and the writing style directly from a source text would likely be averted.

The use of teacher (expert)-generated images in the pictorial map (see Figure 3) also was supported by cognitive load theory. Teacher-generated graphics, in contrast to student-generated graphics, improve reading comprehension because students are able to more easily follow well-designed organizers and focus their limited cognitive abilities on reading the text and visualizing major ideas (Chang, Sung, & Chen, 2002; Katayama & Robinson 2000; Mayer, 2005). In the pictorial map, students saw a limited number of teacher-generated images (9-12 photos) representing the idea units of an original passage. A calendar, for example, represented one month, and a state map represented Arkansas. Furthermore, the interrelated organization of the pictorial map (i.e., who, what, where, when, why, and how) addressed the associative habits of some writers who may either skip from topic to topic without an overall plan or focus on the details in individual sentences, or pairs of sentences, rather than concentrate on main ideas.

The customary instructional approach in contemporary college-level tutorials and fact sheets calls for students to underline or circle the main ideas of a source passage and then to write their summaries. Some instruction, moreover, advises students not to look at the original while paraphrasing or summarizing and then restate the text from memory (see Appendix A).

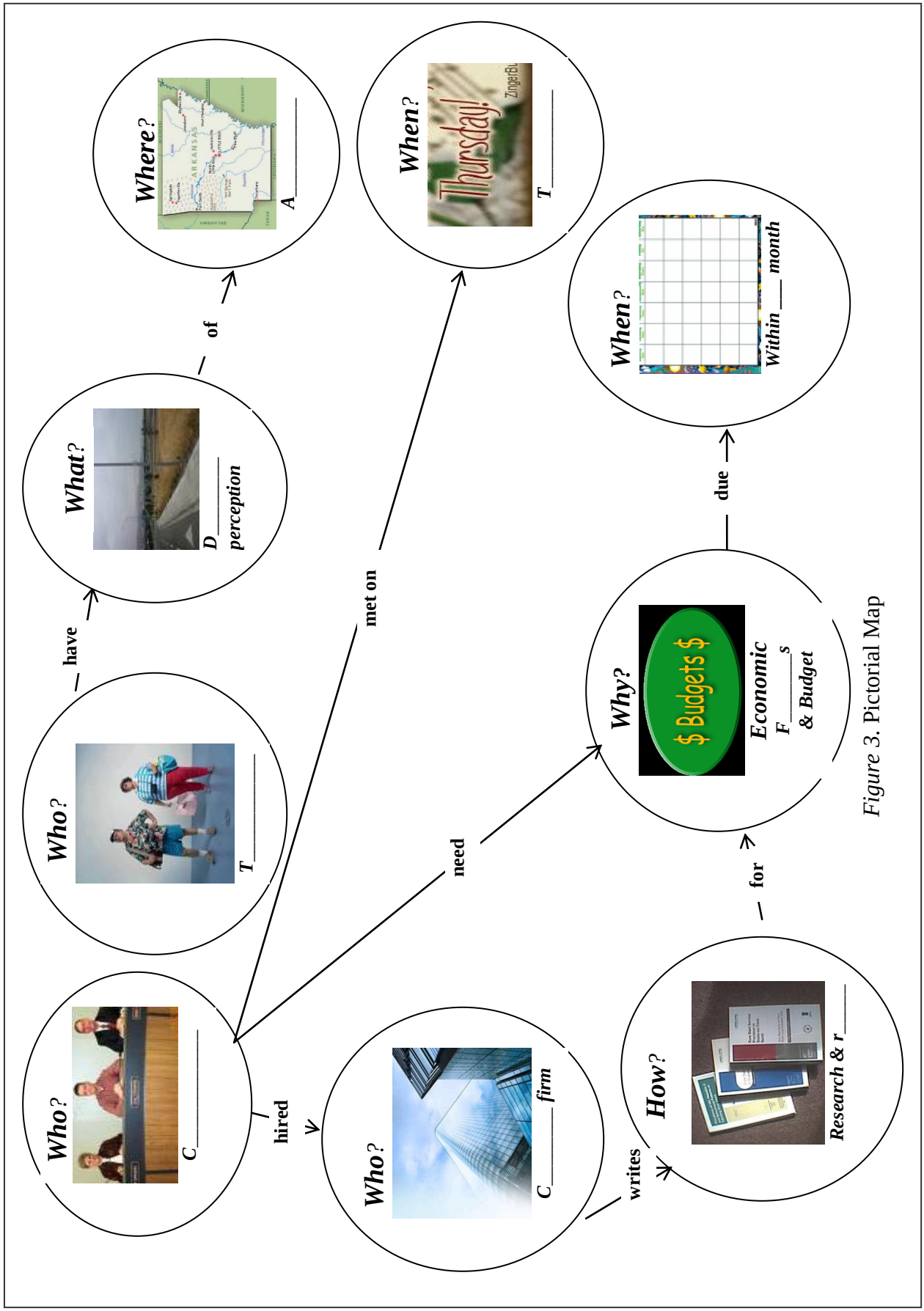


Figure 3. Pictorial Map

The summary writing benefits of *pictorial* maps were partially supported by Chang, Sung, and Chen (2002) in their empirical study of *concept* maps (previously referenced) that tested the mapping effects on both reading comprehension and summary writing. Chang et al. had extended the research of Chmielewski and Dansereu (1998) who found that students improved their reading recall and comprehension when using knowledge maps and then transferred mapping strategies to later tests even when mapping was not explicitly called for. Chang et al. was the first study to test how mapping strategies improved summary writing skills, as well as reading recall and comprehension. Chang et al. asserted that summary writing and mapping required similar cognitive processes in having to view the main ideas and key concepts, and understand their linked relational propositions. They found that students in partially completed map and map-correction conditions did significantly better in summary writing than students in the control condition.

The research objectives and design of Chang, Sung, and Chen (2002) were similar to this study in three ways: (1) pre-and post-tests that measure summarizing ability; (2) intact experimental groups with map correction, scaffold fading, or map generation conditions, (3) and a control group. This study differed from Chan, Sung, and Chen, however, by testing whether a *pictorial* map rather than a *hierarchical concept* map would enhance summarization skills. This experiment added to their research in several other significant ways. First, the participants in this study were American college students rather than Taiwanese fifth-graders. Second, the materials were written in English rather than Chinese characters. Third, the instructional treatment was conducted in less than two hours rather than after seven weeks of mapping instruction. Fourth, this

study was paper-based with teacher-generated *pictorial* maps as opposed to *concept* (text only) maps manipulated on a computer screen in the experimental condition. Lastly, the visual treatment used a unique scaffolding format with partially completed blanks that was significantly different from Chan et al. as well as other college-level formats reviewed by this researcher (see Appendix A).

Theoretical Rationale

Dual coding and cognitive load were the two major theories providing the theoretical rationale for this study.

Dual coding theory

According to dual coding theory (DCT), learners process incoming sensory information in two functionally distinct cognitive subsystems of memory (see Figure 1). There is (1) the verbal process channel for processing language and (2) the nonverbal process channel for processing images. These two processing channels each create separate codes or units for representing and organizing incoming information that learners process into knowledge to be stored, acted upon, and subsequently retrieved for use. In the verbal channel, the *logogens* are the codes (or units) for verbal entities organized according to associations and hierarchies. In the nonverbal channel, the *imagens* are the codes (or units) for mental images organized according to part-whole relationships (Clark & Paivio, 1991; Paivio, 1971, 1983, 1986; Sadoski, Paivio, & Goetz, 1991).

In addition to these subsystems (i.e., verbal and nonverbal), according to Paivio (1971), there are three types of processing: (1) representational, (2) referential, and (3) associative. Each of these three processes has its own characteristics. First, the representational process is either directly activated by verbal channel representations or directly activated by non-verbal channel representations. Second, the referential (connection) process is activated either in the nonverbal system by the verbal system, or conversely, activated in the verbal system by the nonverbal system. Third, the associative process is activated by the verbal representations within the same verbal subsystem or the nonverbal representations within the same nonverbal subsystem.

The elements in the verbal and nonverbal subsystems are intricately connected, allowing learners to create images when they read or hear words and generate names or construct descriptions when they see pictures (i.e., referential processing). When learners process information in both the verbal (i.e., printed and oral word descriptions) and nonverbal (i.e., pictures depicting the printed and oral word descriptions) process channels, the encoded information is additive. This means the information represented with both process codes is stronger than the information represented only with either the verbal process codes or the nonverbal process codes. However, the strongest form of additive information is a result of the referential (connection) processing.

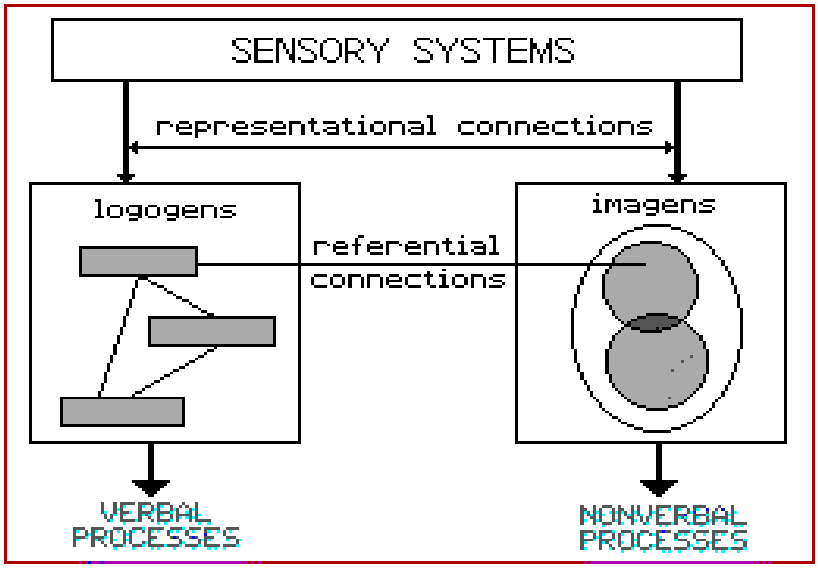


Figure 1. Paivio's Sensory Systems. Copyright 1994-2010 by Kearsley, G. The Theory Into Practice Database. Reprinted with permission.

The strengthened encoding from both channels enables learners to have better recall and understanding of information. However, due to the interconnectedness of the coding channels, additional information processed by both subsystems may result in redundant coding that actually interferes with learning (Sweller, 2005). Instructional materials should therefore be designed to integrate or elaborate on additional information handled by both verbal and nonverbal codes, so learners are not forced to split their attention and mentally integrate the information themselves between the two channels (Kalyuga, Chandler, & Sweller, 1999; van Merriënboer & Ayres, 2005).

If a learner were to be presented with a pictorial map (i.e., a graphic organized with both pictures and words) that represented the main ideas of a text (verbal) passage, the graphic organization of the pictorial map would allow the learner to see the main ideas of the text passage and visualize their relational meaning to other linked ideas and labeled images in the text passage. The interconnected subsystem coding therefore

enables the learner to indirectly reference or activate the related representations from both subsystems (i.e., referential information). Furthermore, according to Paivio (1971, 1983, 1986), the *concrete* language (i.e., sensory words) in a text passage would be processed by both coding subsystems and evoke an additional web of language and images. In contrast, the *abstract* language (e.g., words that represent actions, qualities, and relationships) in a text passage would be processed by the verbal system primarily and depend on language (verbal) associations to construct meaning.

Let us look at a specific example of how dual coding theory would be operationalized in a hypothetical pictorial map representing the ideas of a text passage that has the concrete word *Arkansas*. This word might generate a number of verbal channel representations for a learner. For example, the learner may recognize that this state is located in the southern region of the United States. The word *Arkansas* also may generate a nonverbal image representation that has shared characteristics with the learner's actual experiential perceptions. The learner's cognitive processing of the word *Arkansas* may, in fact, form a visual image of the state capital in Little Rock, or the word *Arkansas* may activate an uncomfortable emotional response from the learner who has experienced the humid subtropical climate on a recent vacation. Conversely, the abstract phrase of *dreary perception* in the proposed pictorial map that mirrors the response of some Arkansas tourists in the original source passage might be defined primarily by the learner's other verbal language associations for its meaning, such as Arkansas being a gloomy, ominous, uninteresting, or unpleasant place.

The interconnectedness of the two coding systems allows a learner to create mental images when hearing words and recall the names or descriptions of things when

seeing pictures. More proficient readers tend to perform these two processes automatically, although empirical studies (e.g., Suzuki, 1985) have found that even older, more proficient readers will better comprehend text when they also are prompted to use or create nonverbal mental images for verbal text. Less skilled readers, on the other hand, may experience more difficulty in creating nonverbal images for words that have associated meanings and will tend to focus only on decoding the words as they read (e.g., Hibbing & Rankin-Erickson, 2003).

Based on the reading comprehension research related to verbal and nonverbal processing, pictorial maps may benefit learners with different levels of reading ability. Furthermore, the cognitive architecture of having two separate yet interconnected channels to process incoming information may help many learners to avoid the well-documented tendency to copy text or retain identical sentence structures from the original text when writing summaries or paraphrases (e.g., Ercegovac & Richardson, 2004; Roig, 1997, 1999, 2001). Dual coding may trigger beneficial associative wording from the learners' schema (i.e., knowledge structure) that differs from the exact wording and sentence structures of an original text passage. A pictorial map, moreover, may assist learners who have less topical interest in a passage or limited summarization skills by visually enhancing their perception of key ideas and their relational meaning to other ideas in a text passage (e.g., Levin & Mayer, 1993).

Cognitive load theory

Cognitive load theory (CLT) states that learners have a limited working memory capacity for novel information, restricting the degree of immediate change that would

occur in the practically unlimited capacity and duration of long term memory. The learner's working memory can be easily overloaded when more than a few chunks of novel information need to be simultaneously processed. According to CLT, the instructional designer always should consider the rather severe cognitive limitations and influences of working memory on learning and performance when the learner has to process multiple demands (Sweller, 2003, 2004). More specifically, instructional material must account for three different types of cognitive load: intrinsic, extraneous, and germane (Chandler & Sweller, 1991; Mayer, 2001, 2005; Sweller, 1988, 1999, 2005). The extent to which these three relevant processes interact with each other in an instructional design drives the total amount of cognitive load (Sweller, Van Merrienboer, & Paas, 1998; Young & Stanton, 2002; Van Merrienboer & Sweller, 2005).

First, the intrinsic load on working memory refers to the interactivity inherent in the material or task to be learned, and it is partly influenced by the learner's expertise or prior knowledge. When the learner has some prior knowledge stored in long-term memory constructs, referred to as schemas (i.e., information with multiple elements serving a specific function), there are fewer intrinsic load demands placed on the learner's working memory from the material or task being learned (e.g., Chandler & Sweller, 1991).

Second, the extraneous load on working memory, which is also referred to as ineffective cognitive load, results from instructional techniques that require learners to perform working memory activities not related to schema formation (Sweller, 1999). Extraneous cognitive load does not contribute to learning but may be changed by an instructional design (Sweller, 2003). It may also be modified by enhancing the

organization, chunking, adjunct aids, specific learning instructions, and presentation techniques of the information to be learned.

Third, the germane (i.e., effective) load on working memory results from beneficial cognitive processes promoted by the instruction (Gerjets & Sheiter, 2003). Germane load refers to the load that helps to construct new complex schema in a successive manner, such as assisting or enabling the learner to move from a novice to expert level. When intrinsic and extraneous load leave resources in working memory, the learner may then make an effort to engage in learning.

How instructional material presents information to the learner, and the subsequent steps required to learn the information or task also impose cognitive load. Poorly designed instructional material for children and adults that places unnecessary cognitive demands on working memory and interferes with the learner's ability to acquire schema becomes extraneous (i.e., ineffective) load. Well designed instruction, on the other hand, that does not require learners to use their limited working memory for irrelevant or inefficient activities reduces the extraneous load and may increase the germane (i.e., effective) load. During the early stages of learning, the cognitive demands of an instructional treatment and the intrinsic load of the material or task being learned is the highest for most individuals at all grade levels. Studies have found that extraneous load is reduced when the instructional design integrates text and pictures, uses multiple modalities for presenting text and pictures, and avoids redundant information (Chandler & Sweller, 1991; Mousavi, Low, & Sweller, 1995). The research on the cognitive capacity of working memory also discusses scaffolding strategies, which refer to the support structures that decrease cognitive load and guide instruction. Scaffolding helps

learners at all grade levels to concentrate on elements of the material or task relevant to the learning goals (e.g., Hmelo-Silver, 2006).

Consistent with CLT research, the scaffold of a partially completed pictorial map (i.e., pictures and words with partially completed labels and linked relational lines) was intended to enhance the learning process. A pictorial map would be sensitive to the learner's memory limitations and increase cognitive resources (i.e., germane load) to acquire and automate schemas for the complex task of learning how to summarize a source passage. A pictorial map would provide a visual substitute for any possible missing schema in the learner's long-term memory. A pictorial map also would help to construct schema that the learner could bring into working memory, especially for unfamiliar or uninteresting text passages. More aware of their cognitive schema or mental models related to a text passage, learners would think more readily of associated verbal constructs from their own working vocabulary and may be encouraged to use a more natural writing style if they had to restate the original text in a summary.

In contrast, if a learner were asked to underline main ideas in the text passage, there may be insufficient scaffolding and an increase in extraneous load on working memory as the learner worked toward an instructional goal. In attempting to restate an original text passage without a pictorial map as a scaffolding guide, the learner may resort to inadequate or expedient problem-solving strategies, such as copying the underlined or circled word strings and lifting sentence structures from a source passage.

The scaffolding research also appears to favor a teacher-generated map with partially completed labels to reduce intrinsic load because it minimizes confusion and eliminates the training on how to draw maps (e.g., Camperell & Reeves, 1982; Holley &

Dansereau, 1980/1981; Reader & Hammond, 1994). A teacher-generated pictorial map, moreover, was intended to lead to a deeper learning by reducing extraneous load and freeing cognitive resources to handle intrinsic and germane loads (Mayer, 2005; Mayer & Moreno, 2003; Sweller, 2005).

Purpose of the Study

The purpose of this study is to determine whether a pictorial map is a better instructional strategy than underlining or circling main ideas in a tutorial on how to write a summary. The secondary purpose is to discover if a student's interest in the source topic has an impact on the quality of the summary.

To achieve this purpose, the study consisted of college students from intact groups who were given either the control or experimental tutorial (i.e., treatment). The control treatment asked students to underline or circle the main ideas of an original passage, whereas the experimental treatment asked students to view and fill in the blanks of a pictorial map representing the original passage. Except for the differentiating step (i.e., underlining/circling ideas or filling in a pictorial map), both the control and experimental treatments consisted of identical instructions. The two original passages in the treatments were a high-interest topic (politics) and a low-interest topic (ballet). This researcher had conducted several pilot studies with similar intact college groups from 2008-2010 to determine the suitable high- and low-interest topics for original passages in the control and experimental treatments (see Appendix B).

The overarching intent of this study was to develop the most effective instructional design for teaching college students how to properly summarize a source

text passage. A summary writing rubric, adapted partially from empirical research (Jackson, 2006; Roig, 2001), was developed to rate the quality of the written summaries. The rubric consisted of five criteria: main ideas, accuracy, restated words and writing style, conciseness, and length (see Appendix C). The rubric scores from both the pictorial map and underline/circle text treatments were compared and analyzed to identify the differences in the quality of the summaries. A pre- and post-treatment test consisting of eight true-false questions and two multiple-choice questions (see Appendix D & E) also measured any differences between the students' prior summarization knowledge and their knowledge after taking the tutorials. In addition, students completed a post-treatment survey to evaluate their topic interest in the text passages and assess the value of the underlining/circling and pictorial map steps in the treatments (see Appendix D & E).

Research Questions

This study explored whether a visual strategy (pictorial map) would produce different results than a text-based strategy (underline/circle text) in a tutorial on how to write a summary. More specifically, three primary research questions were addressed:

1. What are the differences in *main* effects between a partially completed pictorial map *format* and an underline/circle main ideas *format* condition on the quality of a summary?
2. What are the differences in *main* effects between a high-interest *content* (politics) and a low-interest *content* (ballet) condition in a source passage on the quality of a summary?

3. What are the *interaction* effects of the *format* conditions (pictorial map versus underline/circle text) and the *content* conditions (high-interest versus low-interest topics) on the quality of a summary?

Significance of the Study

This study was important for three reasons. First, the outcomes of this experiment were intended to mitigate the broad problem of inadvertent plagiarism (i.e., accidental copying), troubling to educators and administrators and seemingly on the increase with proliferating Internet writing services (e.g., Gajadhar, 1998; McCabe, 2001). Second, the pictorial map treatment represented a novel instructional approach with empirical roots in the reading recall and comprehension research that would now be tested in the related cognitive context of how to write a summary (e.g., Rubman & Waters, 2000). Third, the pictorial map introduced a hybrid adjunct intended to capture and hold the interest of students who may have a range of reading abilities and to reduce their cognitive load, while leading to improved outcomes in their summary writing ability (e.g., Reader & Hammond, 1994).

In higher education many practices are aimed at correcting inadvertent plagiarism, ranging from instructional materials on documentation rules and citation examples to severe academic and administrative penalties (Ercegovac & Richardson, 2004). The most effective pedagogic approaches, however, focus on graded opportunities for students to practice summarizing and paraphrasing skills (e.g., Schuetze, 2004). This study therefore extended the research in effective strategies to teach summary writing using an experimental tutorial for college-level students (e.g., Walker, 2008). In addition,

the treatment tutorials were intended to alleviate the workload and time demands on instructors who must evaluate student writing and provide useful feedback on how to properly restate original text (Wade-Stein & Kintsch, 2004).

The benefits of using pictures and maps for text recall and reading comprehension has an extensive research history dating from the early 1980s (e.g., Levie & Lentz, 1982) to more current studies (e.g., Sadoski, 2001; Verdi & Kulhavy, 2002; Yin, Ruiz-Vanides, Ayala, & Shavelson, 2005; Zillman, Knobloch, and Yu, 2001). In contrast, the research on using graphic strategies specifically for writing summaries has far less empirical support (e.g., Chang, Sung, & Chen, 2002). Therefore, this study was situated within these overlapping areas by borrowing a visual strategy from the reading research and introducing a new hybrid adjunct that integrates pictures, in addition to the six journalism questions, with directional-line mapping for writing summaries. Furthermore, using pictures and mapping to represent ideas and their relationships was intended to be a construct that teachers could easily explain to college students.

The picture-and-text scaffolding of a pictorial map was the cognitive support to learn how to write a summary. With pictures being provided in the tutorial rather than being drawn by students, the cognitive load and potential misinterpretations of text by students were minimized. Partially blank picture and line labels, a design strategy tested successfully by Chang, Chiao, Hsiao, and Chen (2000) and van Merrienboer (1990), also was intended to bridge cognitive gaps for students who have to solve a common problem inherent in reading comprehension and summary writing, which is to identify ideas units and conceptual relationships within an original passage.

Rather than having to restate an original passage with minimal or no assistance at all, students were actively engaged with the original text passage by seeing questions and filling in blank/partially blank labels or by underlining/circling text. They were not just passively reading or rereading the text. These tutorials also were designed to be modified by domain-knowledge instructors who could insert their own course-related content as source passages. Finally, this study was intended to improve the overall learning outcomes in any college course that requires effective reading and writing skills.

Definition of Terms

Adjunct aid or display – refers to a spatial format that represents key concept ideas and also is referred to as a "structured overview" (Barron, 1969).

Advance organizer – refers to information such as a brief analogy or diagram presented before the text and is used to prime or provide prior knowledge for organizing and interpreting the subject matter (Ausubel, 1960, 1968; Mayer, 2003).

Aptitude – refers to any characteristic of a person that forecasts the probability of success under a given treatment (Cronbach & Snow, 1977, p. 6).

Concept Map – refers to a two-dimensional nonlinear graphic representation of concepts (i.e., graphic organizer) that have labeled links between the concepts (Novak, 1990; Novak & Gowin, 1984).

Dual-coding theory – postulates that both visual and verbal information is processed differently and along distinct cognitive channels with the human mind creating separate representations for the data processed in each channel. Visual and verbal codes for

representing information are used to organize incoming information into knowledge that can be acted upon, stored, and retrieved for subsequent use (Paivio, 1986, 1971).

Elaboration theory – describes an approach that simplifies sequencing conditions in an instructional design where all the conditions simplifying the task are identified, and the instruction starts with the most simple yet authentic case that might be encountered in the real world (Reigeluth, 1996).

Far Transfer – refers to the extent that individuals apply what they learned in training to situations different or new from those in which they were trained (Laker, 1990). It requires an approximate match between the training and the task content, training and task outcomes, and an emphasis on general concepts and skills (Royer, 1979).

Graphic organizer – refers to a two-dimensional visual and spatial display or format with wording that conveys key concept relationships of text information (Alvermann, 1986; Berkowitz, 1986; Gori-Rosenblit, 1989; Simmons, Griffen, & Kameenui, 1988; Tukey, 1990). The visual portrayals or illustrations depict relationships among the key concepts in a learning task (Hudson, Lignugaris-Kraft, & Miller, 1993; Moore & Readence, 1984).

Idea unit – refers to a single complete idea or block of information consisting of a sentence, clause, or phrase.

Interaction – occurs when a situation has one effect on one kind of person and a different effect on another (Cronbach & Snow, 1977, p.3).

Knowledge maps – refers to a nonlinear graphic representation in which ideas are located in nodes and connected to other related ideas through a series of labeled links. These differ from mind maps, concept maps, and graphic organizers in the deliberate use of a common set of labeled links connecting ideas, such as *L=leads to, P=part of, Ex or*

EG=for example, and *C=characteristic of* (Chmielewski & Dansereau, 1998; Dansereau & Newbern, 1997; O'Donnell, A.M., Dansereau, D.F., & Hall, R.H., 2002).

Matrix diagram – refers to a type of graphic organizer that uses rows and columns to represent and convey comparative concepts (Kiewa, Dubis, Christina & McShane, 1988).

Outline – refers to a linear format of hierarchical concept relationships usually with their subordinate and attribute values (Darch & Gersten, 1986; Glynn, Britton, & Muth, 1985).

Reading comprehension – refers to the extraction of meaning from a text and may be conceptualized by various processes, including decoding, accessing word meaning, and extracting relationships among ideas units in a text (Golinkoff, 1976).

Scaffolding instruction – refers to a teaching method that provides differing degrees of assistance for learners according to their progress. It encompasses all devices or strategies that support learning, including a combination of performance support and fading (Rosenshine & Meister, 1992).

Schema theory – claims that our minds contain skeletal frameworks with slots for specific information (Bartlett, 1932).

Signaling – refers to words and cues that make the structure of text more salient without adding new information, and it includes highlighting, headings, summaries, outlines, and pointer words (e.g., first, second) (Meyer, 1975).

Situational interest – refers to a state that is short-lived, context-dependent, and based on spontaneous engagement, novelty, curiosity, or salient information content (Krapp, Hidi, & Renninger, 1992; Schraw & Lehman, 2001; Wade, 1992).

Structured overview – refers to the name for a graphic organizer in the early research (Barron, 1969).

Subordinate – refers to a concept in an hierarchical system that can be grouped together with at least one more concept of the same level to form a higher-ranking concept. For example, *proper noun* and *common noun* would be subordinate concepts of the superordinate concept *noun*.

Summarization efficiency – refers to the number of major idea units in the summary divided by the total word count of the summary (Garner, 1982).

Superordinate – refers to a concept in a hierarchical system that can be subdivided into a number of lower-ranking concepts. For example, *noun* would be the superordinate concept of the two subordinate concepts *proper noun* and *common noun.*

Symbol – refers to a graphical image that conveys a single concept (Abbott, 2000; Detheridge & Detheridge, 2002).

Theoretical Writing Model – contends that the materials available in the task environment influence the writer's long-term memory, and subsequently influences how the writer organizes the information (Flower and Hayes, 1981).

Tree diagram – refers to a type of graphic organizer that represents multiple levels of subordinate concepts without referring to attribute values.

Topic interest –refers to a stable and content-specific state (Schiefele, 1999). It also refers to a longstanding interest in a topic based on pre-existing knowledge, personal experiences, and emotions (Alexander & Jetton, 1996; Schiefele, 1991; Tobias, 1994). It also may be identified as "personal interest."

Training Transfer – refers to the extent that knowledge, skills, and abilities acquired in training can be applied, generalized, and maintained over time (Baldwin & Ford, 1988).

It also refers to the extent that individuals can apply what they learned in one situation to another situation (Baldwin & Ford, 1988; Holton, Bates, Seyler, & Carvalho, 1997).

Treatment – refers to any manipulative variable that varies the pace, method, or style of instruction, including classroom environments and teacher characteristics (Cronbach and Snow, 1977, p. 6).

Venn diagram – refers to a collection of closed circles in a relationship with each other and all possible logical relations indicated in the diagram (Edwards, 2004).

Visual argument – conveys the relationships among ideas through the spatial arrangement of words rather than ordinary written language (Waller, 1).

CHAPTER TWO

REVIEW OF THE LITERATURE

This literature review examined the research on summarization and graphic strategies that impact the cognitive processes in reading comprehension and summary writing instruction. This review also develops a contextual framework for the design and methodology of this experiment, and presents findings from three general areas—summary skills, graphic organizers, and pictorial representations. It uncovers the particular claims that bear directly on the overarching question: What effect does a pictorial map in a college-level tutorial have on the quality of written summary? The thesis of this study specifically states that students who fill in a partially labeled pictorial map of idea units, rather than simply underline or circle idea units, will write better quality summaries. A primary reason for this conclusion is that a pictorial map primes memory to retrieve and construct relevant schema, facilitating one's own wording and writing style, and helps to avert the tendency to copy word strings and the writing style of the original passage.

This literature review is organized into five sections: (1) summarization processes, issues, and instructional approaches; (2) graphic strategies and methodological problems; (3) scaffolding principles and techniques; (4) learning transfer and relational knowledge in summarization; and (5) effects of picture illustrations in reading and interest. Significant findings in these areas are summarized and synthesized to provide satisfactory claims for advocating the thesis. The major literature groupings and their

evidentiary themes will be connected; and any gaps, omissions, and compelling questions related to this study's methodology will be identified. This literature review concludes with a rationale for the pictorial map as a valuable adjunct for summary writing instruction.

Summarization Processes, Issues, and Instructional Approaches

Summarization is generally defined as the process for determining what ideas in a text passage are most important and succinctly restating them in one's own words and writing style (e.g., Howard, 1999). The summarization research related to this study covered several perspectives, ranging from inadvertent plagiarism to reading comprehension issues and writing skills (May, Campbell, & Doll, 2000; Harris, 2002).

From a plagiarism perspective, research was divided into three categories: direct plagiarism, patchwork plagiarism, and citation plagiarism (e.g., Harris, 2001; Klausman, 1999; Lasarenko, 1996; Lathrop & Foss, 2000). Direct plagiarism is considered a form of cheating or academic misconduct and was outside the scope of this study. Patchwork plagiarism is a developmental process that examines how students copy sections of an original text, change syntactical structures, and substitute synonyms (e.g., Howard, 1999; Marsh, Landau, & Hicks, 1997). This form of plagiarism is often considered an early stage in learning when students are still processing material before they advance to the comprehension stage. The research in citation plagiarism included studies in library and information sciences on formal referencing (e.g., Lampert, 2004; Stubbings & Brine, 2003) as well as studies in cognitive psychology and instruction (e.g., Walker, 2008).

The research literature presented extensive data about students and faculty who misunderstood the guidelines for properly summarizing and paraphrasing, and how faulty assumptions led to inadvertent plagiarism (e.g., Barry, 2006; Landau, Druen, & Acuri, 2002). Roig (1997) found that almost 50 percent of college students could not identify plagiarism due to a misunderstanding of the rules. Other researchers (e.g., Lasarenko, 1996) tested instructional exercises that helped students to distinguish the criteria between summarizing and paraphrasing, but they found that students continued to restate original passages improperly, which resulted in plagiarism.

Two major studies focused on students' adherence to faulty beliefs on how to restate text passages properly. Using a Web-based tutorial treatment, Jackson (2006) conducted a large-scale study with 2,829 undergraduates. Students compared original and reworded passages from various disciplines (e.g., social sciences, humanities) to assess whether plagiarism had occurred. In an experimental tutorial, students studied the reasons for properly restating text to avoid plagiarism and then restated original passages. The results showed that students continued to use the exact language of an original source without inserting quotation marks and often omitted the main points. Jackson concluded that students did not understand the concept that paraphrasing involves grasping the core meaning of an original passage and writing it in their own words. In an earlier study of 316 college students, Roig (1997) had asked participants to classify plagiarized passages ranging from blatant to more subtle forms. The results of his experiment indicated that 65% of the students felt that even a superficially arranged version of an original text was still not plagiarism. Roig's confirmed his premise that changing the original text seemed relatively unimportant to students when they were asked to restate a passage; students

considered even relatively minor modifications of the original text to be adequately restated.

According to Anderson and Hidi (1988), there are five basic processes in summarization. The writer must determine what information from the original passage to (1) select, (2) reduce, (3) reword, and (4) reorganize, while (5) accurately representing the original meaning. The first two processes are complementary: selection (i.e., what ideas to include and reject) and reduction (i.e., what ideas to condense). These two processes, asserted Anderson and Hidi, develop over time as the thinking abilities of students mature. The early summarization research (Garner, 1985; Hare & Borchardt, 1984) found that these common developmental processes correlated to different age groups. In elementary school, for instance, children are often confused about what points to select for a summary, and they focus instead on choosing unusual ideas more often than the important ones. Problems in selecting the main ideas from a source passage continue throughout middle and high school years, even until students reach college.

The selection process in a summarization also is affected by the characteristics of the source text. Main ideas are more difficult to select from an expository passage than from a simple narrative text. In addition, when the original text becomes longer and more complex, students find it harder to determine which ideas are important. Closely related to problems in selecting important ideas from a source text are difficulties in restating a topic sentence from a source in which the main idea is stated implicitly. In these cases, early studies suggested that only the most expert student writers were capable of inventing topic sentences on which to build their summaries (Brown & Day, 1983; Garner & McCaleb, 1985).

Reduction is the second complementary process in summarization used in conjunction with selecting and restating the main ideas of a source passage (Johnson, 1983). In this process students must condense and prioritize information by replacing the details with more general ideas, known as superordinate concepts. This core thinking process is especially problematic for young children who frequently want to delete entire chunks of material and then copy the remainder of the text. The inability to reduce text, however, does fade away gradually in older children, and by the time students reach their college years they are typically more adept at replacing detailed ideas with more general ones (Johnson, 1983).

In addition to understanding how these common thinking processes are applied to the summarization strategy, an instructional designer must know the student's purpose for summarizing the text. According to Hidi and Anderson (1987), the purpose of a summary fell into two general categories: writer-based and reader-based. In a writer-based summary the student's primary purpose is to comprehend an unfamiliar text. A proficient writing style (i.e., correct grammar, cohesive sentence structure, brevity) is relatively unimportant. In a reader-based summary, on the other hand, the student's primary purpose is to construct a summary for other readers to clearly understand the contents. Since a reader-based summary applies to a public context—in the form of school assignments, research papers, articles, or book abstracts—using a proficient and polished writing style is as important as capturing the main ideas. The scoring rubric in this study therefore includes a criterion stating that a quality summary is "concisely worded, has no unnecessary details, and information is well organized and easy to read with transitions" (see Appendix C).

Other areas covered in the instructional design literature were the general approaches to presenting information. The instructional designer, according to Hidi and Anderson (1987), teaches summarization in three ways: (1) as a set of rules to strategically condense text, (2) as a technique to guide reading comprehension, or (3) as a textbook tool in conjunction with graphic organizers to ensure a reader's understanding of content. Most of the college textbooks (e.g., Hacker & Simmons, *A Writer's Reference*, 2011) and reference guides on summary writing (see Appendix A) that were reviewed for this study used only the first approach; they presented rules for summarizing text in sequential steps or procedural statements. Similarly, both the control and experimental tutorial treatments of this study used a procedural approach with summarization rules and best practices. In addition, however, the tutorials incorporated instructional techniques from reading comprehension and graphic strategy research (e.g., Anderson & Hidi, 1988; David, 1998; Sadoski, 2001). The overall design of these tutorials involves elements from all three instructional approaches: summary rules, reading techniques, and graphic strategies.

Graphic Strategies and Methodological Problems

The research on graphic strategies provided a framework to explain the features of the pictorial map in this treatment and its relationship to other types of two-dimensional graphic presentations. Broadly defined, graphic strategies attempt to illustrate clearly the knowledge structures of a text passage in a visual way, giving the reader a better understanding of what is being reviewed (e.g., Chimielewski & Dansereau, 1998). Rooted in Ausubel's (1968) theory of meaningful receptive learning, the rationale for

graphic strategies is that they are capable of linking new material in a content area to any previously stored meanings in a person's memory, thereby strengthening the reader's cognitive structure. These knowledge structures are characteristic of successful learners who are adept at solving problems and performing other cognitive activities (e.g., Baxter, Elder, & Glaser, 1996).

In general, there are three types of graphic strategies used by an instructional designer to tap into a learner's knowledge structure: knowledge maps, concept maps, and graphic organizers**.** These three strategies share certain features yet have several distinct differences. Unfortunately, some researchers have vaguely described the graphic strategies used in their studies, or they applied different, interchangeable terms that often led to confusion and misinterpretation when someone attempts to draw conclusions from their findings (Kim, Vaughn, Wanzek, & Wei, 2004). Therefore, to clarify these common terms, especially as they relate to the pictorial map of this experiment, this researcher listed in Table the three graphical strategies with their key corresponding features.

Table 1

Graphical Strategies

Category	Link Labels	Link Lines	Nodes	Structure
Knowledge map	Standard words	Directional	Words and concepts	Hierarchical
Concept map	Non-standard words	Directional or Non-directional	Words and questions	Arranged by concepts and line orientation (e.g., linear, circular)
Graphic organizer	Non-standard words or images; not required	Not required	Words or images; not required	Various shapes (e.g., star)

Although visually different, the three graphic strategies are all similar in their underlying principles and applications. Basically, they all convert linear text statements into graphic formats. All are two-dimensional linear conversions, or tree structures of text, that facilitate easier retention, retrieval, and comprehension. The pictorial map in this study borrowed features from each of the three strategies to form a novel, hybrid visual structure intended to be fairly straightforward and suitable for a self-paced student tutorial treatment, and it has not been tested in the summary writing research to date.

A brief examination of these strategies clarifies how the pictorial map blends key graphical features. Knowledge maps are two-dimensional information formats with nodes and links. They provide directional relationships between nodes, using links with standard label types in a hierarchical structure, as the following example illustrates (see Figure 4; Rewey, Dansereau, & Peel, 1991).

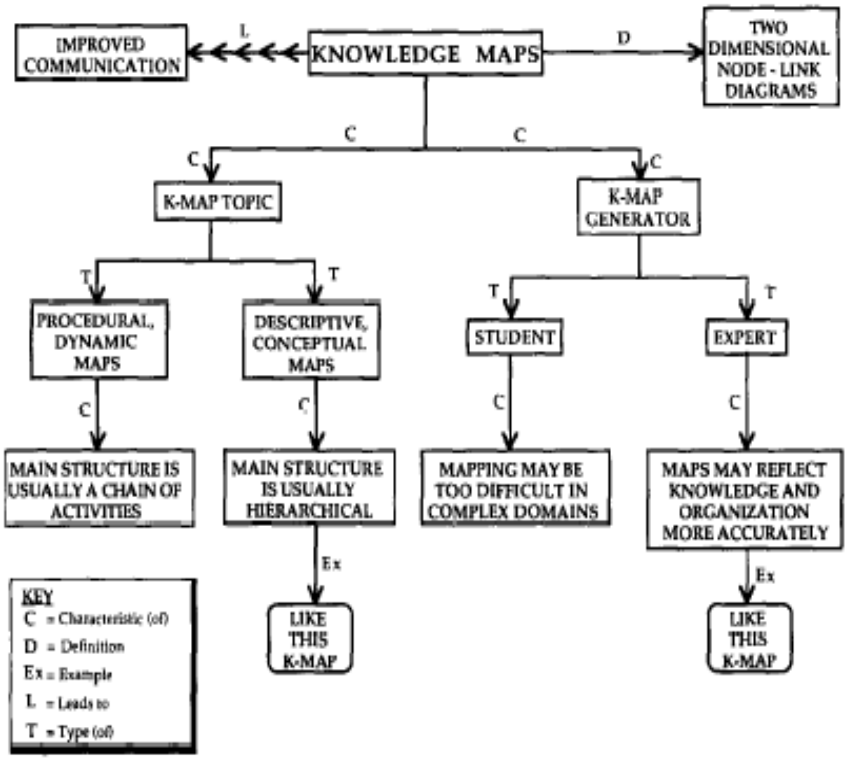


Figure 4. Knowledge map with directional links and link types between nodes.

The nodes in knowledge maps contain words or concepts connected to each other by links identifying the relationships between nodes. Knowledge maps differ from other two-dimensional formats (graphic organizers and concept maps) in two ways: they provide the *direction* of the relationships between nodes with linking lines, and the links are named with a standard system of *label types* (Moore & Readance, 1984).

Concept maps and graphic organizers are closely related to the visual format of knowledge maps. Like knowledge maps, concept maps are two-dimensional formats with labeled links between concepts (Novak, 1990; Novak & Gowin, 1984). They consist of nodes (or cells) with concepts, terms, or questions, but unlike knowledge maps, the linking lines *may or may not have directional arrows* from one concept to another. The linking line words, phrases, or images describe the relationship between nodes. The linking lines, together with linking words or phrases, are called *labeled lines*. Like knowledge maps, two nodes connected by a labeled line are propositions that explain the relationship between nodes, and the propositions read like a sentence.

The structure of a concept map is determined by the hierarchical arrangement of concepts and orientation of linking lines. The increased flexibility gained by a variety of nonhierarchical patterns, as illustrated by the linear, circular, hub/spokes, tree, and network/net types in Figure 5 (Yin, Vanides, Ruiz-Primo, Ayala, & Shavelson, 2005), as well as non-standard link labels of concept maps and graphic organizers, comprise the hybrid or blended design for the treatment in this study.

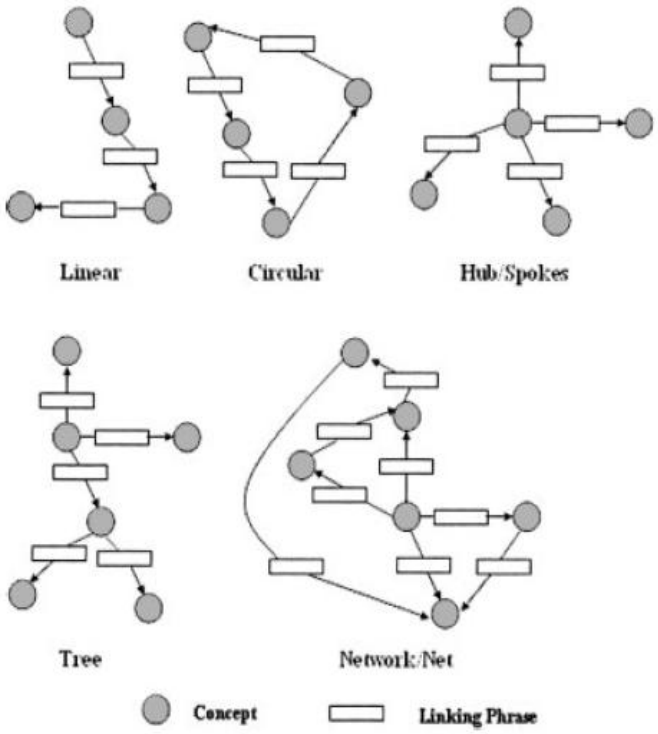


Figure 5. Concept map with nodes and directional arrows in five patterns.

The following example of a concept map further illustrates how a flexible configuration, using a tree structure and non-standard links and images, enhances the idea units and relationships in a hypothetical narrative story about a family kayak trip to Canada (see Figure 6).

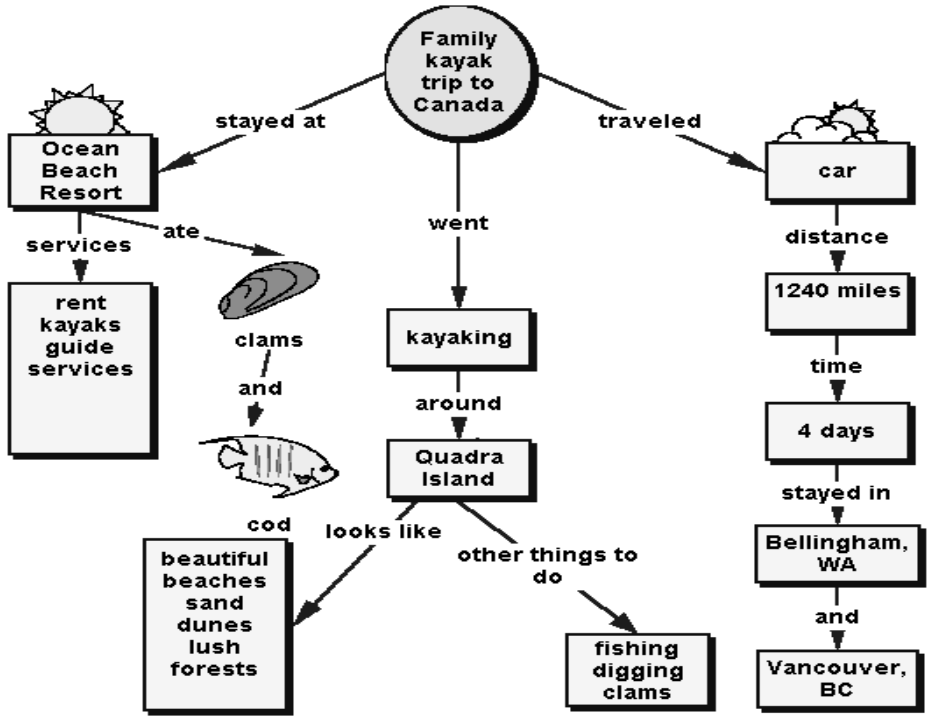


Figure 6. Concept Map example for narrative story. Copyright 2010. The Graphic Organizer. Reprinted with permission.

Graphic organizers are the third and largest category of graphical strategies and have the most structural variety (Alvermann, 1981; Berkowitz, 1986; Guri-Rosenblit, 1989; Simmons, Griffen, & Kameenui, 1988; Tukey, 1990). They take many different formats (e.g., brainstorming webs, Venn diagrams, thinking grids or matrices, flowcharts). The directional lines, labeled connectors, and nodes with enclosed concepts—although present in a number of formats—are not required features. Graphic organizers also are categorized and referred to by other names, such as concept maps, entity relationship charts, and mind maps. These factors contributed to the operational confusion and methodological inconsistencies noted in several major reviews of the research (Dunston, 1992; Griffin & Tulbert, 1995; Kim, Vaughn, Wanzek, 2001; Moore and Readence, 1980, 1984; Rice, 1994).

Star diagrams are one of many types of graphic organizers that condense and organize any data about multiple traits, facts, or attributes associated with a single topic. Star diagrams are useful for basic brainstorming about a topic or for simply listing all the major traits related to a theme. The circular design of the star structure presents a simple visual representation to the learner that, together with some features from knowledge and conceptual maps, forms the basic outline of this researcher's hybrid (or blended) graphic strategy (see Figure 7).

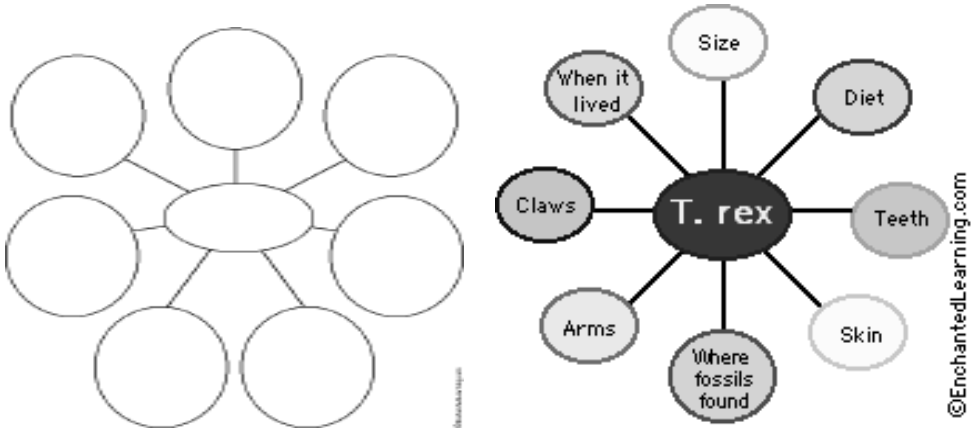


Figure 7. Star structures (blank and T. rex example) of graphic organizer. Copyright 2009 by Enchanted Learning. Reprinted with permission.

The center circle of the illustrated star structure (Figure 3), however, was considered a superfluous node in the summary writing tutorial of this experiment for two reasons: (1) It interferes visually with the directional arrows from other nodes that are needed to clarify various propositional relationships, and (2) it implicitly assumes that only one main or central idea emerges from any passage to be summarized. Moreover, the star configuration without a center circle or hub also placed more emphasis on the outer nodes reserved for the constructs of the six journalism questions (5 W's & 1 H), as discussed in another section of this literature review (see Figure 8).

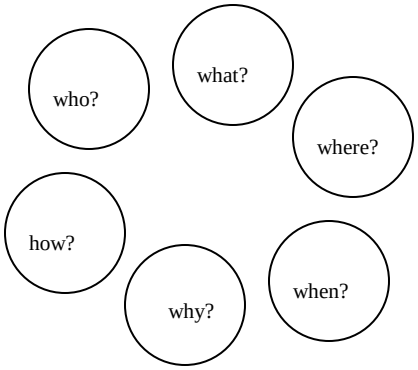


Figure 8. Star graphic organizer without center hub and with 5 W's & 1 H.

During the past 25 years, six major literature reviews were conducted on graphical representation research. Moore and Readence (1980) first applied meta-analysis procedures in examining 16 studies, and then in 1984 they reviewed 23 studies, adding both quantitative and qualitative research outcomes to their review. Their major conclusion was that graphical strategies contributed to better memory recall and comprehension than non-graphical tools. However, Moore and Readence (1980, 1984), and then Dunston (1992) in a later literature review, all found that the learning effects of graphical strategies in the research were inconclusive due to the numerous variations and inconsistencies in operational criteria, such as the type and specific configuration of the graphical organizers actually used in these experiments.

After 1992, subsequent research reviews (Griffin & Tulbert, 1995; Kim, Vaughn, Wanzek, 2001; Rice, 1994) confirmed and elaborated on similar methodological issues found in the earlier literature (i.e., Moore & Readence, 1980, 1984; Dunston, 1992). Overall, these reviews uncovered five major problems in the research. First, the studies that generated significant learning outcomes had all used researcher-developed assessments rather than standardized tests to report the data. Although researcher-constructed tools provided more accurate measurements of specific learning outcomes,

the lack of standardized testing was considered a methodological flaw. Most of the research reviewed for this study also used the same passage for both implementation and assessment, so whether the benefits of using graphic organizers generalized (i.e., transfer) to other text conditions, or how they affected achievement scores, remained unclear. Second, the comparison conditions of the graphic organizer studies were not considered robust enough in their methodologies. Most of the experiments compared the graphical strategy condition to a distal condition (such as typical reading instruction) and not to another specifically comparable adjunct aid strategy (such as structured overview) to determine whether graphic organizers were truly superior. Third, the timeframes for the treatment conditions varied considerably—from one to 10 weeks—and the participant training methods on how to use graphic organizers ranged dramatically from brief and implicit guidance to extensive and detailed instruction. Fourth, most studies deployed teacher-generated graphic organizers and measured improvements in reading comprehension scores rather than teaching students how to become more independent readers. Finally, corroboration was absent among the various research interventions, and the graphic strategies were not replicated under different treatment conditions (Griffin & Tulbert, 1995; Kim, Vaughn, Wanzek, 2001; Rice, 1994).

Based on this researcher's close examination of these major studies and literature reviews, several distinct features of graphic organizers drew primary attention: (1) construction of organizers, (2) scaffolding and problem-completion strategies, (3) learning transfer, and (4) recall and comprehension of relational knowledge. The findings in regard to these four key features warrant further commentary in subsequent paragraphs because they related to the purpose and design of the instructional treatment.

In the literature on constructing graphic organizers, researchers rigorously debated whether teacher (expert)-generated or student (reader)-generated graphic organizers were more effective treatments. Some researchers (Chang, Sing, & Chen, 2002; Katayama & Robinson, 2000) argued that teacher (expert)-generated graphic organizers produced more benefits in reading comprehension than student (reader)-generated graphic organizers because students easily follow well-designed organizers constructed by teachers (experts), and then are freed to focus their cognitive abilities on reading text and finding major ideas. Other researchers claimed that student (reader)-generated graphic organizers allowed more in-depth cognitive processing of knowledge and fostered more autonomous learning strategies (Barron & Schwarz, 1984; Dansereau, 1989; Griffin, Malone, & Kameenui, 1995; McCagg & Dansereau, 1991). However, researchers who supported student-generated graphics also pointed out that when students constructed their own graphics they consumed valuable time, expended considerable cognitive effort, and felt overwhelmed by the sheer complexity of the task (e.g., Dansereau, 1989). These divergent conclusions about who should construct graphic organizers, as well as their learning efficacy, were compounded by inconsistent test conditions and differing variables, such as organizer types, the amount and type of training, and the ages and reading abilities of participants.

Empirical evidence supporting a particular construction strategy (i.e., student- or teacher-generated) failed to emerge in the literature. Due to these inconclusive results, in January 2009 this researcher decided to gather data from a pilot sample of college students to determine whether students or teachers should actually construct the graphic organizers in the experimental treatment. This informal pilot study included a step in the

summarization tutorial asking students to construct their own graphic organizers, which were simple line drawings, representing the main points in the source paragraphs (see Appendix F). In a post-tutorial survey, pilot students indicated that their drawings did not help them to better summarize the text; their average score was 2.71 on a scale from 1 [strongly disagree] to 5 [strongly agree]). During a post-tutorial group discussion, these students also made the following comments: (1) "I hate to draw," (2) "Drawing is difficult for me," and (3) "Drawing is like using another part of your brain" (see Appendix F). These candid remarks—coupled with mediocre summary writing results from this pilot study—corroborated the conclusions from researchers Dansereau (1989) and Katayama and Robinson (2000) on the advantages of student-generated graphics. The student reactions in the pilot study also helped this researcher to realize that limited classroom time for the experiment was a major barrier to training students on how to draw their own graphic organizers or pictures. As a result, this researcher explored studies on scaffolding techniques to discover if they would alleviate time constraints in this experiment and allow students to realize cognitive benefits by participating in at least some aspects of graphic map construction.

Scaffolding Principles and Techniques

The research in scaffolding focused on studying the relationship between instructional design and a learner's cognitive load (e.g., Paas, Renkl, & Sweller, 2003; Renkl & Atkinson, 2003; van Merrienboer, Kirschner, & Kester, 2003). Scaffolding encompasses various devices and strategies in the instructional design that support learning. These devices and strategies provide different degrees of assistance to learners

according to their progress during the learning process (Rosenshine & Meister, 1992). These devices and strategies helped learners to achieve goals they may not have been able to reach without these supports.

Studies have found that scaffolding enhances learning ability and increases the amount of transferred knowledge (e.g., Day & Cordon, 1993; Kao & Lehmn, 1997). Learning is achieved because scaffolding decreases cognitive load and frees up the learners' resources, so they concentrate on key aspects of the task relevant to instructional objectives (Hmelo-Silver, 2006). As learners reach their goals and begin to learn independently, support is gradually reduced or removed (i.e., fading) until it is unnecessary (van Merriënboer, Kirschner, & Kester, 2003).

In this experimental treatment, there were certain text variables that influenced the instructional format and scaffolding, such as original text length (short paragraphs), text type (expository), and text complexity (implicit topic sentences or main ideas). Some participant attributes—including (1) the amount of college-level training in summary writing, (2) non-learning disabled students, (3) low- and high-skilled reading levels, (4) learning styles, and (5) low-topic and high-topic interest in the passages to be summarized—were also considered in designing the instructional scaffolds.

Human cognitive architecture, according to Sweller (2003, 2004), has two major characteristics: (1) the unlimited capacity of long-term memory organized in hierarchical schematic knowledge structures (i.e., schema), and (2) the limited functionality of working memory restricted in capacity and duration while processing new information and easily overloaded when more than a few chunks of information are processed simultaneously (Baddeley, 1986; Cowan, 2001; Kalyuga, 2007; van Merriënboer &

Sweller, 2005). These cognitive characteristics provided the rationale for the tutorial scaffolds in this study. Both the experimental and control treatments have identical scaffolding steps to accommodate different learner aptitudes and cognitive load limitations. The only step not identical between the two treatments was the manipulated variable. In the experimental condition there was a pictorial map step, and in the comparison condition there was an underlining/circling text step. The pictorial map and underlining/circling text both served as scaffolds for their respective treatments.

In the review of instructional scaffolds, this researcher discovered a scaffolding feature in the Generating Interaction between Schemata and Text (GIST) strategy that was used in the experimental condition (Frey, Fisher, & Hernandez, 2003). The GIST strategy had incremental scaffolds to improve comprehension of the expository passage when a student writes a summary. The GIST strategy divided the original text at regular intervals and asked the student to write a single summary sentence (usually 20 words or less). Then at each subsequent stopping point the student is asked to write another summary sentence that includes the main points of the prior summary sentence plus the main points of next few sentences until reaching the end of the text (Cunningham, 1982; Herrell, 2000). In some K-12 tutorials using a GIST strategy, the student also must consider the six journalism questions (who, what, where, when, why, how) when writing summary sentences. This researcher decided to incorporate these six questions as an organizing strategy in the pictorial map of the experimental treatment.

It also is important to note that none of the current *college-level* tutorials reviewed in the literature used these six journalism questions. Typical college-level instruction asks students only to underline or circle key phrases or main ideas of a text passage.

Thus, underlining/circling original text emerged as a natural choice for the scaffolding strategy in the control treatment. The remaining steps of college instruction typically call for students to delete minor and redundant details, jot down important ideas on note cards, and look up unfamiliar words (e.g., Casazza, 1993). These methods were either directly or indirectly incorporated into the overall design of both treatments in this study.

Given the learning challenges that younger students encounter in selecting and reducing text to write an acceptable summary in their own words, it was not surprising to find more scaffolding devices in K-12 instructional materials than in college-level guides (e.g., Richardson & Morgan, 2005). However, studies in reading comprehension indicated that college students, including many in this researcher's courses, also found it difficult to select and create general (superordinate) ideas, especially when explicit topic sentences were missing or the main ideas of the source text were subtle (e.g., Feldman, Anderson, & Mangurian, 2001; Harris, 2002; McCabe, 2001; Wilhoit, 1994). Subsequently, many college students will often copy phrases and sentences directly from the source passages This researcher therefore concluded that only one scaffolding step, such as underlining or circling the main ideas of a source passage, provided insufficient support in teaching students how to write quality summaries.

Based on a sampling of instruction (see Appendix A) and the aforementioned studies, there appeared to be significant differences between the multi-layered scaffolds of many K-12 materials and the relatively scaffold-free formats in college-level guides. This wide gap in instructional design provides opportunities for empirical research. A compelling rationale emerged from the literature and current instruction to explore the effects of a mapping scaffold comprised of (1) selective images to help in recalling and

comprehending text, (2) partially completed labels and connecting lines to show the connections among idea units, and (3) a contextual structure of six basic journalist questions (who, what, where, when, why, how) to organize relational propositions in an expository passage. It appears, in fact, that the pictorial map tested in this experiment has never been used in college-level instruction or studied in the literature up to this time.

A scaffolding approach discussed in the research is completion strategy, which is a process requiring learners to work progressively toward solving problems, starting with a partial solution and advancing in steps toward a full solution. Three studies (Chang, Chiao, Hsiao, & Chen, 2000; Sweller, van Merrienboer, & Paas, 1998; van Merrienboer, 1990) found that learners who began with a partial solution and gradually completed all the steps to arrive at a full solution learned more effectively because partial solutions acted as cognitive bridges that engaged learners and prevented memory overload. Chang, Sung, and Chen (2002) observed that students were better able to identify and connect key concepts of a source passage with knowledge maps (either 40% completed or intentionally erroneous and needing corrections) and had significantly better comprehension than students who did not use scaffolding or a completion strategy.

Katayama and Robinson (2000) also found that partially completed graphic organizers increased reading comprehension more significantly than skeletal graphic organizers (i.e., without text labels to represent concepts). They surmised that skeletal organizers required more effort for students to complete and probably overloaded their cognitive processes. These favorable empirical results supported this researcher's decision, after a January 2009 pilot study mentioned earlier in this review, to use partially

completed text labels and teacher-generated images as the scaffolding completion strategy for the pictorial map condition of this experiment.

A number of studies have found that knowledge maps improve a reader's understanding of information (Hall, Dansereau, & Skaggs, 1992; Hall & O'Donnell, 1996; Hall & Sidio-Hall, 1994; Rewey, Dansereau, Skaggs, Hall, & Pitre, 1989). Extending these findings from reading comprehension to summary writing test conditions, a study by Hall, Hall, and Saling (1999) concluded that college students who wrote summaries while viewing only a knowledge map without any text in the nodes (i.e., cells with concepts or questions) recalled significantly more superordinate propositions (i.e., concepts subdivided into lower-ranking concepts) than students who studied only the original passage. They also found that "knowledge map-only" students recalled more superordinate propositions than both the "knowledge map with text nodes" and "no-knowledge map" students. Hall et al. (1999) decided that the "knowledge map-only" students recalled more concepts because they were forced to actively process information not provided with the text while writing their summaries. Therefore, the absence of supporting text in the "knowledge map-only" group actually promoted stronger learning outcomes. They also speculated that students who read the "knowledge map with text nodes" may have had too much information at their disposal, and the no-cue group (i.e., "knowledge map-only") had too little information to process.

While Hall et al. (1999) supported student-generated mapping to assist students in processing and organizing ideas, other researchers cautioned that the size and complexity of a map may overwhelm or intimidate many students, reducing motivation and learning, and lead to repetitive, haphazard, or misinterpreted ideas (Camperell & Reeves, 1982;

Dansereau, 1989; Holley & Dansereau, 1980/1981; Wiegmann, Dansereau, Pitre, Rewey, & McCagg, 1990). In any case, whether favoring student-generated or expert-generated mapping, the research was in agreement that the size and simplicity of maps were key scaffolding elements affecting instruction in both reading comprehension and summary writing. For this experiment, the researcher decided to test expert (teacher)-generated maps because they might lessen problems in cognitive processing and provide students with more accurate and less confusing representations of text, especially main ideas (Rewey, Dansereau, Skaggs, Hall, & Pitre, 1989). In addition, the expert (teacher)-generated maps in this study included completely labeled linking lines as well as partially labeled linking lines between concept nodes, as suggested by Hall et al., to engage students in processing information and to promote better outcomes. To date, combining expert (teacher)-generated maps and pictures with partially labeled nodes and linking lines has not been tested empirically, so this study extended the research on these scaffolding strategies in summary writing instruction.

Lending further support for graphic maps in summary writing instruction was the empirical research by Rewey, Dansereau, and Peel (1991), which was conducted prior to the Hall et al. (1999) study. Rewey et al. measured concept recognition and recall in written summaries after college students either reread a text passage or studied a knowledge map. Although they found no differences in the accuracy of summaries after students reread a text passage or studied a knowledge map, Rewey et al. discovered that the knowledge map group—and not the text rereading group—performed better in recognizing central ideas in source passages. Their findings are relevant to this study because the control treatment asked students to underline or circle the main ideas while

reading a source passage, and the experimental treatment asked students to study a pictorial map as their initial step in writing a summary. Based on this literature review documenting the positive results of mapping scaffolds, this researcher anticipated that a pictorial map would provide more benefits than underlining/circling the main ideas of a passage during the process of writing a summary in one's own words and writing style.

Learning Transfer and Relational Knowledge in Summarization

A transfer of learning occurs when knowledge or skill in one context enhances (i.e., positive transfer) or undermines (i.e., negative transfer) a related performance in another context. The concept of transfer also may be categorized as near transfer, which refers to a closely related context or performance, or far transfer, which refers to a different context or performance (Perkins & Salomon, 1992). Early studies in reading established that students trained in schema formation and mapping techniques had significantly more recall of information in later reading contexts (Royer & Cable, 1976; Thorndyke, 1977). Chmielewski and Dansereau (1998) found that college students who had previous training in knowledge maps recalled more macro-level ideas when reading subsequent text passages even when knowledge maps were missing. Although their post-study questionnaires did not specifically ask students if they thought about previously studied knowledge mapping tools when they read the subsequent passages, Chmielewski and Dansereau suggested that mapping strategies and reading comprehension positively transferred when students read new passages without having any corresponding adjunct aids. Overall, these three representative studies on learning transfer offered a highly encouraging as well as cautionary perspective on this experiment. Students instructed to

summarize text from a visual treatment with mapping may improve their ability to write summaries in subsequent writing contexts when the treatment condition (i.e., pictorial map) is not present. Thus, this learning transfer would lessen the need for additional tutorials to maintain a student's summary writing proficiency. However, one limitation of this study is that the transfer of mapping strategies and summary writing skills in future academic settings falls outside the scope of this experiment.

Another skill impacting the quality of a written summary is relational knowledge. A student with relational knowledge understands how superordinate concepts (i.e., general ideas subdivided into lower-ranking ideas) are related to subordinate concepts (i.e., ideas grouped with others of the same level to form higher ranking ideas). Graphic strategies (e.g., knowledge maps, concept maps, graphic organizers) are particularly adept at facilitating this type of learning (McCagg & Dansereau, 1991). In a study with learning disabled (LD) middle school children, DiCecco and Gleason (2002) used graphic organizers to visualize the relational knowledge embedded in social studies passages. Using recall tests and summary measurements, they found that graphic organizers helped LD students gain significantly more relational knowledge from expository text than those students in a non-graphic organizer condition. Similarly, in a study with non-LD college freshmen, Kools, van de Wiel, Ruiter, Cruts, and Kok (2006) examined the reading comprehension value of graphic organizers and found that macro-level graphic organizers encouraged students to learn more global-level information than individual facts. The empirical data from Kools' study, correlating graphic organizers to improved reading skills, also suggested that graphic strategies provided benefits in summary writing

because these two skills require similar cognitive processes (e.g., determining the general meaning of a passage).

The steps for using concept maps are similar to the skills required for writing summaries. In concept mapping, key ideas must be identified, structured, and converted into propositions; similarly, in summary writing, topic sentences must be selected or created, details eliminated or collapsed, and ideas ranked and integrated for relevance and importance. Chang, Sung, and Chen (2002) conducted the first study to extend the concept mapping research for summary writing. Their study attempted to determine whether students would retain and apply concept map strategies to text summarization conditions at a later time (i.e., far transfer). Their study involved 126 fifth-grade students from Taiwan who were trained in concept mapping twice a week in 40-minute sessions over a four-week period. Posttests in reading comprehension and text summarization were conducted one week after the formal concept map training. Students in the map correction group performed significantly better in reading comprehension and summarization writing than other students. More importantly, in regard to learning transfer, 79% of the students in the map correction and scaffold-fading groups reported they had remembered using concept mapping during their reading and summarizing posttests which occurred one week after their initial training.

Chang, Sung, and Chen (2002) provided encouraging empirical data that graphic strategy skills acquired in reading comprehension training transferred positively to subsequent summarization conditions even when students were not asked to specifically apply them. The learning transfer benefits of the Chang et al. study again suggested that the aforementioned assumptions about learning transfer limitations of this experiment

will be worth exploring in future studies. However, this experiment did extend the Chang et al. study in a number of other important ways. It focused on college participants who wrote summaries of English language passages rather than fifth-graders who wrote Chinese characters, used a hard copy instructional method as opposed to a computer application, and included summary training as an integrated aspect of the overall treatments in lieu of four weeks of prior training lessons.

Effects of Picture Illustrations in Reading and Interest

Similar to concept maps and other graphical strategies, picture illustrations perform a number of functions related to cognitive processing. These include (1) making text more decorative without being relevant; (2) representing and visualizing particular events, persons, places, or things in text; and (3) organizing and interpreting text (Levin, 1981; Levin, Anglin, & Carney, 1987). The decorative functions of pictures were outside the scope of this proposed study. As visual constructs they are analogous to verbally seductive details that are novel, concrete, and engaging—yet irrelevant in their capacity to increase a reader's interest in an otherwise uninteresting text (Garner & Gillingham, 1991; Garner, Gillingham, & White, 1989; Schraw, 1998). Also outside the scope of this review was sign theory research, also called semiotics, which refers to signs and their relationship to meaning, formal structures, and the effects on people (e.g., Dewey, 1946; Leeds-Hurwitz, 1993). On the other hand, recent studies on the representative and interpretive functions of picture illustrations specifically impacting one's ability to recall and comprehend text passages related directly to the current research question that examined the learning and interest effects of pictorial maps in an instructional tutorial.

Studies on motivation have shown that an expository passage with concrete ideas tends to be more interesting and easily recalled (e.g., Hidi & Baird, 1988; Sadoski, 2001; Wade, Buxton, & Kelly, 1999). Similarly, if abstract ideas in an expository passage are expressed more concretely with sensory language, students are better able to recall them (Beck, McKeown, & Worthy, 1995). Surprisingly however, when concrete details are added to an already well structured and coherent text, they usually have little or no effect on the reader's interest (Schraw, 1998; Spooren, Mulder, & Hoeken, 1998). The findings on topic interest, text recall in reading, and the type of language representation (i.e., concrete or abstract) used in a text passages offer interesting and important correlations to this study which used the representative and visual functions of pictures and images to improve the summary writing process.

Adding pictures to a text passage creates a complex interaction of learning effects. The early research on reading, emphasized in the literature reviews by Levie (1987) and Levie and Lentz (1982), was plagued with inconsistent learning objectives (e.g., recall, comprehension, problem solving, inference) and instructions (e.g., free learning, forced learning, mental imagery) that complicated how to interpret learning outcomes. Later, a study by David (1998) overcame many of these methodological hurdles and examined the specific learning interaction between a news article's concreteness (i.e., sensory language) and the effects on item recall (i.e., forced learning methodology) by adding representative photos. David's overarching theory was that news articles with concrete language were better remembered than news articles with abstract language, based on his interpretation of Paivio's (1971, 1986) dual coding theory. Consistent with other researchers (e.g., Nelson, Reed, & McEvoy, 1977), he further argued that the superiority

of pictures over text was due to the encoding distinctiveness of pictures at the sensory level For example, when David added representative photos to news articles, he found that they significantly improved recall and interest in *concrete* news but did less to improve the recall of *abstract* news. The key factor in whether the representative photos improved recall and interest, noted David, was the strength of the semantic association between the images and the articles (i.e., the more redundancy or overlapping between visual and verbal elements the stronger the semantic association). The article's concreteness and the reader's sensory experiences, noted Paivio, Yuille, and Madigan (1968) in an early study, have cognitive associations that are highly correlated and commonly interpreted as mental imagery in the mind's eye. In other words, the concrete features of a news article correlated more strongly with attributes of the corresponding photos, and partially explained the increases in recall and interest as compared to representative photos for abstract news articles.

Similar to David's (1998) research, the text passages that students summarized in this study were primarily concrete, event-driven news articles that referred to persons, events, materials, and objects in contrast to predominately abstract, issue-driven articles with broad ideas. It is also important to note that the text passages of this study contained some necessary abstract information that provided contextual background and meaning. The complex relationship between the concrete and abstract ideas relative to their importance in the text passages depends on numerous factors, so this researcher assumed that neither the concrete nor abstract information was inherently more important, which is consistent with other research (e.g., Sadoski, 2001). Furthermore, despite the weaker semantic associations between abstract ideas and their picture representations, discussed

by David and others (e.g., Paivio, Yuille, & Madigan, 1968), this researcher also assumed that many images representing ideas in the treatment passages provided helpful cognitive bridges to the reader's stored memories. The interpretation of text, as explained by Fish (2011), is dependent on the reader's subjective experience and shared understanding of language. These cognitive bridges may therefore improve the reader's mental imagery and consequently produce a better quality summary that is an accurate restatement of the original text in the reader's own words and writing style.

In addition, David (1998) found that students recalled the central ideas of a complex news article in a text-and-photo (or picture) test condition better than a text-only condition. David's findings on the recall of central ideas were important, especially when combined with Rewey et al. (1991) who found knowledge maps also were capable of promoting significantly better recall of main ideas. Together, these studies directly impacted the rationale for the treatment tutorials because the hybrid pictorial map variable, comprised of images and linking lines, was intended to enhance the writer's ability to identify and interpret the main ideas of a source passage while sorting (i.e., deleting and combining) the concrete and abstract ideas.

Unlike previous studies in this literature review, David's (1998) experiment also shed further light on the correlations between the reader's aptitude (e.g., interest and comprehension) and photo variables such as vividness. For example, when the vividness of a picture was closely related to items in the text, David found a significant positive correlation with the reader's interest and comprehension. In earlier studies, Levin, Anglin, and Carney (1987) also had concluded that detailed photos—as well as inferential photos showing relationships among people, events, materials, objects, and

issues—helped to reduce the cognitive gaps between the concrete and abstract qualities of a concept, and assisted the reader in forming a more comprehensible mental image that was used to compose a better quality restatement of the original passage. Therefore, using the conclusions of David and Levin et al. in reading and extending them to writing, this researcher found support for the following hypothesis: Using vivid images that depicted concrete and abstract concepts would not only motivate students by catching their interest, but allow them to leverage more cognitive resources to restate ideas with language from their own memory store of experiences (i.e., schema) rather than inadvertently or purposefully borrowing identical wording and sentence structures from the source text.

A review of the studies in the specialized field of news information also influenced this researcher's decision to select certain images for the pictorial maps. Brosius, Donsbach, and Birk (1996), for example, found that pictures (redundant or supplementary) clearly exemplifying or describing a specific news items improved a student's ability to retain information, whereas standard pictures that merely suggested or indirectly referred to items in an article had no effect on retention. The Brosius et al. study also substantiated earlier media processing theories and research (e.g., Anderson, 1990; Baddeley, 1986; Grimes, 1991; Reese, 1984). These media processing studies found that corresponding images in an article eliminated reader distractions and added retrieval cues to stored information, making it easier to recall information.

In examining how images affect writing, Cole, Muenz, Ouchi, Kaufman, and Kaufman (1997) claimed that color photos were superior to line drawings in producing thematic writing among adults (average age 26 and education level of 16 years). Photos

helped these students to write better goal-directed themes that demonstrated a greater understanding of the assignment, as well as an improved ability to write more fluid transitions and clearly organized ideas. The Cole et al. findings in thematic writing suggested to this researcher that using photos, rather than key words or phrases alone in a mapping variable, would produce similar benefits in summary writing because interpreting and organizing ideas are equally important processes in both reading comprehension and summarization.

Cole et al. (1997) further concluded that well-chosen matches of the photographs to the text items were more significant in contributing to superior writing results than whether color or black-and-white photographs were displayed. Their conclusion was especially important to this study because the experimental tutorials used only grayscale images that are readily photocopied and practical in a multi-page tutorial than color photographs. Consequently, the visual treatment in this study was intended to be applicable for realistic classroom and school workshop settings where expensive color copying or printing equipment is not usually available. Furthermore, the strength of the evidence presented by Brosius et al. (1996), Cole et al. (1997), David (1998), and Levin et al. (1987) underscored the importance of appropriately matching representative images in a pictorial map variable with corresponding idea units in text passages. To ensure images representativeness, this researcher used pictures that were selected by students in a survey conducted in September 2008. In that survey (see Appendix G), various grayscale images were paired with corresponding idea units from a treatment passage, and students rated images on a scale from 5 (“very representative”) to 1 (“counter-representative”).

Finally, two other empirical studies were worth noting in this review of research on image characteristics. Zillman, Knobloch, and Yu (2001) examined the attention-producing effects of articles accompanied by photos among 63 undergraduates. They found that the articles accompanied by photos—whether innocuous (the persons were devoid of harm) or agonistic (the persons were suffering or harmed)—drew additional interest and generated more extensive reading than the text-only articles. Furthermore, Garcia and Stark (1991) noted that readers who visually scanned photos related to the news articles started with the larger photos first, and their attraction was greater in proportion to the increased size of the images. They also pointed out that color photos did *not* increase attention span over the same black-and-white photos—except for their first glances. These two studies guided this researcher's decisions in selecting public-domain, grayscale images of similar sizes and shapes that illustrated characteristics of the idea units in the treatment passages.

In Peeck's (1993) review of pictorial text research, he noted two other key areas that bore directly on the experimental conditions of this study: learner aptitude and instructional cues. The first research area on learner aptitude—including reading ability and visual literacy (i.e., ability to read pictures)—was critical in understanding how someone organizes and interprets text from pictures. The second research area on instructional cues focused on the explicitness of the instructions that accompany illustrations, and how they affected the amount and depth of learning.

In regard to the learner's aptitude, the research findings from several representative studies on reading ability warrant further discussion. In her experiments with 5^{th}-6^{th} graders, an early study by Holmes (1987) not only examined whether pictures

helped students to recall targeted details in text, but whether they facilitated inferential comprehension as well. She found that when students viewed pictures, including redundant ones, they had better recall and more inferential learning than the control group. These favorable results applied to less skilled and more skilled readers. The less skilled readers found relevant clues in the pictures (i.e., magazine photos) and associated them with constructs in a 150- to 200-word passage. Looking at pictures while answering questions helped less skilled readers to understand the text because they are more likely to skip over text they do not understand and are less likely to look back at the original text when answering recall and comprehension questions. In addition, although more skilled readers scored better in the print-only condition, there was no significant difference in performance between more skilled and less skilled readers in the picture-only and the picture-and-print conditions. The positive results by these grade school students in the Holmes study also suggested that potential benefits existed for college students in this experiment who have different reading aptitudes and experience in how to write summaries.

The two studies by Waddill and McDaniel (1992, 1993) on learner aptitudes explored how pictorial illustrations made text passages more memorable for different reading levels among college students. They contended that pictures assisted both the more skilled and the less skilled readers to extract and retain information from expository text. Their specific conclusions, moreover, were noteworthy in regard to how pictorial illustrations affected students who possessed different aptitudes. Pictures that signaled both detailed and relational information enabled the more skilled readers to better attend to the details they may not have deemed important because more skilled readers

ordinarily display increased concentration on general information. Waddill and McDaniel also found that the recall of relational information among the more skilled readers was not improved with the relational pictures. For the less skilled readers, however, both the detailed and relational pictures helped them to recall the text details, even though less skilled readers ordinarily pay more attention to details. Perhaps more surprisingly for the less skilled readers, their recall of relational information was actually decreased by viewing relational pictures.

These varying results among more skilled and less skilled readers led Waddill and McDaniel (1992, 1993) to investigate the selective enrichment view of the functional relationship between pictures and corresponding text. Selective enrichment, simply stated, posits that pictures enrich information which different levels of readers (higher and lower skilled) are considering. As readers acquire more skills over time, they pay increased attention to relevant information and ignore details not useful to their task (Golinkoff, 1976). Using selective enrichment as a theoretical framework, Waddill and McDaniel concluded that more skilled readers also possessed expanded capabilities to remember information signaled by pictures as being relevant to their task. Conversely, less skilled readers (who are more focused on details and have limited ability to encode relational information) are restricted, or somewhat hampered, in realizing the benefits of the relational pictures. These conclusions by Waddill and McDaniel provided encouraging theoretical support for the potential benefits of this study because the pictorial maps included relational word links and detailed pictures. Therefore, these treatments may offer diverse benefits for college students who have different levels of reading and summarizing ability. When students write their first draft summary in the

initial steps of the experimental tutorial, more skilled readers may notice additional relevant details from the images they might otherwise overlook, while focusing on the relational concepts in the completed or partially completed linking line labels. Less skilled readers, meanwhile, also may notice additional text details from associated images while they attend to the relational links that might otherwise go undetected.

Daneman and Ellis (1995) challenged the methodology used in the Waddill and McDaniel (1992, 1993) research that demonstrated how representative pictures made the text more memorable. They argued that the beneficial results of pictures found by Waddill and McDaniel may have simply been a by-product of drawing the reader's attention to key ideas through the process of selective repetition, and were not necessarily a consequence of any mnemonic value in the pictures themselves. Daneman and Ellis inferred that verbal captions may be just as effective as pictures (or line drawings) in making expository details more memorable for the reader. In fact, their findings confirmed the hypothesis. They acknowledged, however, that other types of pictorial and visuo-spatial representations (e.g., pictures, maps, diagrams) also may potentially produce superior results.

The "repetition hypothesis" (i.e., repetition of variables and not the pictures themselves make text more memorable), which was stated by Daneman and Ellis, highlighted the importance of equalizing the number and type of instructional steps in both the experimental and control conditions of these tutorials. In other words, the step containing the pictorial map variable in the experimental format condition was balanced with a matching variable step (i.e., underlining or circling text) in the control format condition. This balance of steps between the experimental (pictorial map) and control

(underline/circle text) treatments was intended to prevent the dependent variable (i.e., quality summary) from being confounded by merely repeating ideas generated by the images, instead of resulting from the intrinsic value of the images in the pictorial map.

A second area of interest from Peeck's (1993) literature review related to explicit instruction. Peeck—citing research by Bernard (1990); Reinking, Hayes, and McEneaney (1988); Weidenmann (1989), and Dean and Kulhavy (1981)—noted that the use of illustrations reach optimum effectiveness when students are explicitly asked to label features of the illustrations (i.e., forced processing). Investigating the potential benefits of illustrated maps for lengthy prose passages, Dean and Kulhavy hypothesized that learners who generated their own maps would better comprehend the text. In their experiments with college students who read a 2,190-word expository passage, Dean and Kulhavy found that students significantly improved their comprehension when they constructed an illustrated map of a passage. In addition, students who labeled specific areas of the illustrated map that visualized key ideas of a passage outperformed students in no-graphic organizer or self-processing groups by remembering more details and demonstrating better comprehension. These improvements were especially significant among low vocabulary participants. By constructing a map with labels, suggested Dean and Kulhavy, learners were free to thoroughly organize the contents of the passage. This encoding process provided a general schema for readers to link the knowledge already in their memory to incoming textual information. Furthermore, these experiments by Dean and Kulhavy demonstrated that learners did not cognitively process spatial adjuncts simply because they were presented to them. Dean and Kulhavy found that the instructions in each condition must explicitly direct students to complete the encoding of

the illustrative organizer. In this experiment the findings underscored the importance of asking students to specifically fill in all the partially blank labels of the pictorial map, or underline/circle the main ideas of the original passage, prior to performing the next step in the treatment tutorials.

Finally, an early experiment by Alvermann (1981) used Mayer's (1979) assimilation encoding theory to understand how graphic organizers assisted students in comprehending passages with different thematic structures. Mayer's assimilation encoding theory stated that graphic organizers helped readers to recall text only when they are forced to reorganize the source information. Alvermann attempted to confirm Mayer's theory by comparing the learning effects of graphic organizers on a descriptive passage with a top-level structure (i.e., general statement followed by specific statements) to a passage with a top-level structure as well as general statements that related to one another. Alvermann found that graphic organizers promoted better recall in passages that required participants to reorganize idea units and deeply analyze their semantic content, providing further empirical evidence for the potential benefits of pictures in text processing. Overall, the research on how picture illustrations related to text features—such as concrete and abstract concepts, central ideas, and thematic organization—and multiple learner aptitudes—such as item recall and comprehension, reading levels, relational thinking, mental imagery, and interest—provided a strong empirical basis for this study.

Summary and Conclusion

The thesis for this study was that viewing and completing a pictorial map, rather than underlining or circling the text of an original passage, would be more effective in producing a quality summary in one's own words, writing style, and in 1/4 to 1/3 the length of the source. The experimental variable consisted of a pictorial map with (1) spatial features (i.e., completed and partially completed concept labels, and directional lines that link these concepts), (2) image characteristics (i.e., concrete and abstract pictures of idea units in uniform size, shape, and grayscale format), and (3) an organizational framework consisting of the six journalist questions (i.e., who, what, where, when, why, how). The extensive research on summarization, cognitive learning, instructional scaffolding, and picture illustrations appeared to support the thesis and provided relevant empirical data that sufficiently explained potential benefits of the experimental variables.

From a broader perspective, the literature review revealed that this study provided an additional bridge in the research findings between summary writing and related areas in reading comprehension, instructional design, and visual learning. Moreover, the literature review uncovered that no studies have been published which compared a traditional text-only strategy of underlining/circling main ideas to an innovative pictorial map strategy. This study therefore raised new and exciting possibilities for further research in designing and testing college instruction on how to write a summary.

CHAPTER THREE

METHODOLOGY

The purpose of this study was to explore whether a visual strategy (pictorial map) would produce different results than a text-based strategy (underline/circle text) in a tutorial on how to write a summary. There were three primary research questions addressed:

1. What are the differences in main effects of a visual (pictorial map) format condition and a verbal (underline/circle text) format condition on the quality of a summary?
2. What are the differences in main effects of a high-interest (politics) content condition and a low-interest (ballet) content condition in a source passage on the quality of a summary?
3. What are the interaction effects of the format conditions (pictorial map versus underline/circle text) and the content conditions (high-interest versus low- interest topics) on the quality of a summary?

In this section a brief overview of the research design is presented first, and it is followed by the characteristics of the study sample and researchers' qualifications, the independent and dependent variables, satisfaction survey, procedures, pilot testing and scoring reliability, and data analysis.

Research Design

This study used a quasi-experimental design of two independent treatment variables, and each of the two independent variables consisted of two levels. The first independent variable was the *format condition* using (1) the pictorial map of a source passage as the *visual* level and (2) the underlining/circling of a source passage as the *verbal* level. The second independent variable was the *content condition* using (1) a politics passage as the *high-interest content* level and (2) a ballet passage as the *low-interest content* level. The order of appearance for the passages in both treatments was the high-interest politics content first, followed next by the low-interest ballet content. The order of the passages was intentionally not counter-balanced in either treatment so that the order could serve as a scaffold for students to learn a new, multi-step summary writing process. With the politics passage presented first, students had the opportunity to summarize a topic typically perceived as more interesting prior to working on a topic of lesser interest, according to the interest rankings of previous pilot studies with similar students (see Appendix B). The lack of counter-balancing in the order of the passages may be considered a limitation of the research design (see Table 2). In addition, a news article style for both passages was selected as a scaffold to complement the visual format variable that used the six journalism questions (who, what, where, when, why, and how) as an organizing tool.

This study had two dependent variables: (1) the summary writing scores and (2) the summarization knowledge scores. Students also completed a post-treatment satisfaction survey that assessed their responses to the treatment variables.

Table 2.

Independent Variables: Format and Content Conditions with Two Levels

Format	*Content*
Visual (experimental)	Politics
	Ballet
Verbal (control)	Politics
	Ballet

Characteristics of the Study Sample

The participants in this study consisted of 66 "non-traditional" undergraduates (i.e., working adults) who were students of this researcher from February 2011 to April 2011 at the Northern California Regional Campuses of two private, non-profit, WASC-accredited universities. This researcher randomly assigned students to two treatment groups (verbal format group or visual format group) within each intact class. The size of the treatment groups was equal with each group having 33 students. Thirty-six percent were men (n=24) and 64% were women (n=42); the students ranged in age from 20 to 59 years old for both genders. This researcher also recalculated the 10-year age ranges (20-29, 30-39, 40-49, 50-59) marked by students on their post-treatment surveys into two equal 20-year age ranges (20-39 and 40-59). This recalculation indicated that 66.7% (n = 22) of the students were 20-39 years old, and 33.3% (n = 11) were 40-59 years old in the *verbal* group; and 48.5% (n = 16) of the students were 20-39 years old, and 51% (n = 17) were 40-59 years old in the *visual* group. When the ages of all participants were combined, it was found that 58% (n = 38) were ≤39 years old and 42% (n = 28) were ≥40 years old. Based on current national statistics (Adult Learners in Higher Education, 2007; Harvey, 2009), the participants in this study reflected the gender and age range

distribution of typical "non-traditional" adult learners. Table 3 shows the distribution of students according to their universities, the specific course titles, and type of treatment groups.

Table 3

Participants by University, Course, and Treatment Groups

University	Course Title	Verbal	Visual
#1	English 103–Writing and Rhetoric	8	9
	Liberal Studies 300–Liberal Arts Foundations	9	7
#2	Interdisciplinary Studies 300–Critical Thinking Seminar	10	10
	Interdisciplinary Studies 308–Advanced Expository Writing	6	7
	Total Participants	33	33

Typically, all students in these four courses are required to write analytical and persuasive essays on a variety of topics that need brief supporting summaries and paraphrases from relevant sources. None of the students in this study majored in degree programs—such as English, journalism, fine arts, government, or communications—that typically may have provided either advanced instruction in how to write a summary or specialized knowledge about the passage contents to be summarized (i.e., politics and ballet). In fact, the percentage of students who had not received any form of summary training in college was 70% (n=46), while the percentage of students with some prior summary instruction was only 30% (n=20). For the students who did have prior instruction (n=20), the average number of courses that included some instruction on how to summarize text was 1.75, and there was an average gap of 3.2 years since the courses were last taken.

Protection of Human Subjects

The protection of human subjects in this study complied with the standards set by the American Psychological Association (2010). All individuals were informed of the general purpose of the study, the number of tasks they would perform, and the confidentiality of all materials. Only group scores were reported in the data analysis, and students younger than 18 years old did not participate. All students were informed that their participation was voluntary, no remuneration would be given, and they had the right to withdraw from the study at any time. Students were told that their grades would not be affected by either their participation or non-participation. Students were given the option to study in the adjacent library or classroom if they did not want to participate; however, all students in each intact group chose to participate. All students signed voluntary consent forms before they were administered the treatments, and all interested participants were told they had the opportunity to learn about the results of the final study. On the treatment materials, participants used a special code that only they would recognize: the first three letters of their mother's maiden name and the last four digits of their Social Security number. No one from the university viewed the treatment data, and all data have been stored in a secure location.

Qualifications of the Researchers

The researcher conducting this study was an adjunct faculty member of the Interdisciplinary Writing Program in the USF School of Management who has taught advanced college writing, research skills, and critical thinking for more than 30 years.

The other individuals who assisted this researcher by monitoring the treatment groups were experienced college administrators with some teaching experience.

Independent Variables: Treatment Description

The instructional treatment contained two independent variables: (1) the format condition and (2) the content condition. The format condition had two levels: (1) the visual level with pictorial maps about the source passages and (2) the verbal level with source passages for underlining or circling ideas in the text. The pictorial maps representing the visual level consisted of approximately 10 pictures each with connecting directional lines and text labels arranged by journalism questions to identify ideas in the source text. The text passages representing the verbal level were duplications of the source to be used for underlining/circling main ideas. In both treatments the students followed step-by-step instructions by either filling in the pictorial map blanks or underlining/circling the main idea units of the text. The content condition in both treatment formats had two levels: (1) a low-interest passage on ballet and (2) a high-interest passage on politics.

Pictorial images

The grayscale images used in the pictorial maps were public domain photos/clip art cropped to thumbnail size (approximately 1-inch x 1-inch dimension) and were obtained by this researcher from random searches of the Internet (see Appendix H). A portion of the images used in the pictorial maps were chosen from a pilot survey of students with similar characteristics as the participants in this study (see Appendix G).

Source passages

The source passages were news article excerpts from the *Washington Post* (2008) that were slightly revised by this researcher so that the readability levels were all roughly equivalent. The reading levels were considered to be representative of typical source information found in college essays. The political passage was 105 words, and had a Flesch Reading Ease score of 30 ("difficult-very difficult") and a Flesch-Kincaid Grade Level score of 14.2; the ballet passage was 130 words, and had a Flesch Reading Ease score of 49 ("difficult-very difficult") and Flesch-Kincaid Grade Level score of 14.4 (Flesch, 1948), calculated by *Microsoft Word©*. Both passages required moderate skills in reading comprehension because the main points in both paragraphs were implied (i.e., no explicit topic sentence). In addition, both passages had unique relational propositions impacting the main ideas. In the politics passage, for example, there was a surprising vote reversal, and in the ballet passage a real-life woman ironically appeared in place of a life-like doll. The topic interest levels (high interest versus low interest) for the two passages were based on a pilot study by this research with college students who had similar characteristics as the participants and had ranked their interest on a number of different topics (see Appendix B).

The treatments were distributed as two separate *Summary Writing Tutorial* "booklets" that contained the different format conditions for the two source passages to be summarized. *Booklet A* contained the verbal format (underline/circle text), and *Booklet B* contained the visual format (pictorial map) for the source passages (see Appendix D & E).

Dependent Variables

In addition to the treatment variables, the *Summary Writing Tutorial* booklets included instruments to collect the data for the two dependent variables and a satisfaction survey to help interpret the results. The booklets also facilitated the collection of all data so that the treatments could be efficiently administered and easily proctored by the researcher and the research assistants.

Summarization Knowledge Score

A 10-item *Summarization Knowledge: Post-test* score (see Appendix D & E) was used to measure the dependent variable of summarization knowledge. The test consisted of eight true-false questions on length, contents, and style of a typical summary, and two multiple-choice questions to select the best summary for a source paragraph. The post-test was a re-ordered and slightly reworded version of the *Summarization Knowledge: Pre-test* to ensure the instrument's internal validity. All pre- and post-test questions had been informally pilot-tested by this researcher with approximately 50 students from different courses during a three-year period (2009-2011) prior to this study, and the feedback from the pilot tests was used to improve the readability and accuracy of the test questions.

Summary Writing Score

A summary writing score was used to measure the second dependent variable on the quality of the summaries written by students in the two treatments. The scores were calculated with the *Grading Rubric for Summaries* developed by this researcher from

several public domain composition rubrics (see Appendix C). The five criteria consisted of the following:

1. Main ideas: captures only the main ideas of the original text
2. Accurate: reflects meaning without distorting or slanting information
3. Words and Style: written in own words and sentence structure
4. Concisely organized: omits unnecessary details from original text and is well organized
5. Length: between 1/4 and 1/3 the length of the original text

Each criteria had a corresponding numerical ranking—from a low score of 1 ("needs to improve") to a high score of 4 ("exemplary"). The total summary writing scores had a range of 5 points (minimum) to 20 points (maximum).

Satisfaction Survey

After writing two summaries and completing the summarization post-tests, the participants took an eight-item (Likert-scale) *Satisfaction Survey* in the booklets to collect their opinions on the treatment formats and source passages, and to gather optional comments on the study. The survey also asked participants for descriptive data on gender, age, degree major, and the amount of prior college training in summary writing (see Appendixes D and E).

Procedure

One week prior to this experiment, students were informed that they would participate in a study to learn how to summarize text and that it was a useful strategy for

their coursework in research and essay writing. On the day of the experiment this researcher and a trained assistant guided students through the *Summary Writing Tutorial Booklets A and B* (see Appendixes D and E) that were randomly assigned to students in each intact group.

Prior to this experiment each assistant had received formal training from the researcher on the purpose and procedure for administering the treatments. Training covered the experimental design and the instruments used to collect data. In addition, the training focused on the importance of closely reading the instructions, adhering to the allotted stop and start times, and completing each section without skipping steps. To ensure test reliability and instrument fidelity, this researcher wrote a procedural script titled *Proctor Instructions* (see Appendix I) and annotated a sample booklet to help the assistants consistently administer each treatment section within the allotted times. The total time allowed for administering the entire treatment was set at 90 minutes, which was based on empirical data gathered from prior pilot tests with similar groups (see Table 4).

Table 4.

Time Allotted for Treatment Sections

Minutes	Treatment Sections
2	Introduction
10	Summarization: Pre-test
12	Instructions for How to Write a Summary
25	Summary Writing: Politics
3	Break
25	Summary Writing: Ballet
8	Summarization: Post-test
5	Satisfaction Survey
90	Total Minutes

After this researcher randomly assigned booklets to individual students at the beginning of a typical class session, the students were separated into two adjoining

classrooms where each treatment group was closely guided by either this researcher or the research assistants. During the "facilitator-led" introduction, the researcher and the assistants emphasized the importance of completing the blanks or partially-filled blanks in the pictorial maps of the visual format and underlining or circling the main ideas in the passages of the verbal format. The instructions also stated that notes should not be written in the booklet. The intent was to focus students' attention on only the pictorial map and underlining/circling text, and note-taking would be a different strategy that might affect the quality of the summaries. Research (e.g., Dean & Kulhavy, 1981) has indicated that students may not perform as well or exert as much effort in an instrument when they are not explicitly directed to complete each task ("forced completion"). This researcher and the assistants also monitored the groups to minimize talking among participants, and this researcher and the assistants were continuously accessible in each classroom to answer any questions about the booklet instructions. Students who did not finish a section of the booklet within the allotted times were told to write the word "*STOP"* in the booklet before beginning the next section.

Instrument Testing and Scoring Reliability

This researcher used the *Grading Rubric for Summaries* as the instrument to score the quality of the summaries (see Appendix C). Two college administrators with teaching experience were recruited by this researcher to test the instrument and ensure its scoring reliability. The testing occurred in two phases: the first phase was conducted one month prior to this study with student summaries from a previous pilot experiment, and the second phase was conducted with student summaries from the first week of this

experiment. In the first phase, the administrators received a one-hour training session from this researcher on how to use and interpret the instrument. They were given 10 student summaries to score independently along with this researcher. After rating the summaries, the administrators and this researcher held a debriefing session to discuss the scores and some variations in the results.

In the second phase of testing, the same two administrators and this researcher again independently scored 10 randomly selected student summaries, only this time the summaries were taken from the actual study. The administrators' results were tabulated and compared again to this researcher's scores for the student summaries. This second test found 80% inter-rater agreement in all five criteria of the scoring instrument among the three independent raters and 85% agreement in two key criteria scores ("main ideas" and "own words and style") among the three independent raters. In addition, this test indicated 100% agreement within one point range for the five individual criteria scores and the cumulative quality scores (see Appendix J). Based on the high percentage of scoring agreement among raters and instrument reliability, this researcher independently scored all the remaining summaries in this experiment with the *Grading Rubric*.

Data Analysis

Since the statistical focus of this experiment was to compare the means of two groups in a limited number of independent and paired-samples tests, this researcher used multiple *t*-tests rather than ANOVA as the more simple and straightforward method of data analysis. The *t*-test was the test procedure for the two dependent variables: (1) the quality of summary writing and (2) the summarization knowledge. The *t*-test measured

the differences in *main* effects of the two *format* treatment conditions (i.e., pictorial map versus underlining/circling of text) and the differences in *main* effects of the two *content* conditions (i.e., high-interest politics passage versus low-interest ballet passage) on the quality of the summaries. The *t*-test also measured the differences in *interaction* effects of the *format and content* conditions of both treatments. In addition, the *t*-test determined whether there were any significant mean differences between the two treatment groups prior to the study in their summarization knowledge, and it was used to analyze the post-treatment satisfaction survey results.

For all statistical tests, the level of significance was set at the .05 level. The interpretation of effect size was based on Cohen's criteria for *d*, where 0.20 is considered small, 0.50 is medium, and 0.80 is viewed as large.

CHAPTER IV

RESULTS

Findings

The primary purpose of this study was to determine if a visual (pictorial map) or verbal (underlining/circling text) strategy was more effective in a tutorial on how to summarize. The secondary purpose was to discover if interest in the source passage contents had an effect on summary quality. This chapter therefore presents a quantitative analysis of collected data from summaries written under two treatment *format* conditions (pictorial map and underlining/circling text) and two *content* conditions (high interest and low interest). Also examined are descriptive data on participants, pre-treatment and post-treatment results of summarization knowledge, and a post-treatment satisfaction survey. For all statistical tests, the level of significance was set at the .05 level.

This chapter is divided into five sections: (1) restatement of research questions, (2) summarization knowledge results, (3) summary writing analysis results, (4) satisfaction survey results, and (5) the summary of major findings.

Research Questions

The following three research questions were addressed:

1. What are the differences in *main* effects of two *format* conditions—partially completed pictorial map (visual) and underlining/circling of main ideas (verbal)—on the quality of a summary?

2. What are the differences in *main* effects of two *content* conditions—high-interest politics passage and low-interest ballet passage—on the quality of a summary?
3. What are the differences in *interaction* effects of two *format* conditions (visual and verbal) and two *content* conditions (high-interest and low-interest topics) on the quality of a summary?

Summarization Knowledge Results

Students took summarization knowledge tests prior to *(pretests)* and after *(posttests)* the treatments. The pretests determined if there were any differences in prior summarization knowledge between the two groups, and the posttests measured changes in summarization knowledge after taking the tutorial treatments (see Appendixes D and E). The pretest consisted of eight true-false questions and two multiple-choice questions; the posttest consisted of similar questions reordered and slightly reworded. Each correct answer counted for one point; a maximum score was 10 points.

The average *pretest* score for the verbal group (underline/circle text) was 6.06, and the average *pretest* score for the visual group (pictorial map) was 6.00. The independent-samples *t* test results indicated no significant mean difference in summarization knowledge scores between the two groups [$t(64)=0.17$, $p=0.87$]. Since there was no significant group mean difference, summarization knowledge was equivalent in both groups prior to the treatments.

When the *posttests* were compared, the average score for the verbal group was 8.30, and the average score for the visual group was 8.12. The mean difference in posttest scores was 0.18 points higher for the verbal group; however, the independent-samples *t* test indicated no significant mean difference between the two groups [$t(64)=0.56$, $p=0.58$]. Therefore, the *format*

conditions—verbal (underline/circle text) and visual (pictorial map)—did not account for any significant difference in post-treatment summarization knowledge. Table 5 shows the average scores and independent-samples *t* test results of the pretests and posttests in summarization knowledge for both treatment groups.

Table 5

Comparison of Pretest and Posttest Summarization Knowledge Scores

Variable	*n*	M	SD	*t*	*df*	*p*
Pretest				0.17	64	0.87
Verbal (Underline)	33	6.06	1.39			
Visual (Pictorial Map)	33	6.00	1.56			
Mean Difference		0.06				
Posttest				0.56	64	0.58
Verbal (Underline)	33	8.30	1.15			
Visual (Pictorial Map)	33	8.12	1.47			
Mean Difference		0.18				

The students in both treatment groups significantly increased their scores on the summarization knowledge *posttest*s. The verbal treatment group increased their average score by 2.24 points from the pretest (M = 6.06) to the posttest (M = 8.30). The paired-samples *t* test results indicated a significant mean difference between the pretests and posttests [$t(32)=8.58$, $p<0.01$] with a large effect size ($d = 1.75$). Similarly, the visual treatment group increased their average score by 2.12 points from the pretest (M = 6.00] to the posttest (M = 8.12). The paired-samples *t* test results also indicated a significant mean difference between the pretests and posttests [$t(32)=6.71$, $p<0.01$] with a large effect size ($d = 1.40$). Although both treatments contributed to significant increases in summarization knowledge, neither treatment was found to be significantly more effective for improving summarization knowledge when the group means were compared. Table 6 compares the average summarization scores and the paired-samples *t* test results for the verbal and visual treatments.

Table 6

Summarization Knowledge Pretests and Posttests for Verbal and Visual

Treatment	*n*	M	SD	*t*	*df*	*p*
Verbal (Underline)				8.58	32	<0.01
Pretest	33	6.06	1.39			
Posttest	33	8.30	1.16			
Mean difference		2.24				
Visual (Pictorial Map)				6.71	32	<0.01
Pretest	33	6.00	1.56			
Posttest	33	8.12	1.47			
Mean difference		2.12				

Summary Writing Analysis Results

This researcher used a summary writing analysis to score the quality of the summaries written by participants as a result of the two treatment conditions. The summary writing score was based on a *Grading Rubric for Summaries* consisting of five criteria: (1) main ideas, (2) accuracy, (3) words and style, (4) concise organization, and (5) length (see Appendix C). Each criteria had four grading levels ranging from "exemplary" (4 = highest score) to "needs to improve" (1 = lowest score). The highest possible total score for a quality summary was 20 points and the lowest possible total score was 5 points.

The summary writing analysis scores were used to compute the *format*, *content*, and *interaction* effects for the three primary research questions: (1) What were the group mean *main* effects of the visual (pictorial map) and verbal (underline) *format* conditions in summary writing quality? (2) What were the group mean *main* effects of the high interest (politics) and low interest (ballet) *content* conditions in summary writing quality? (3) What were the group mean *interaction* effects of both the *format* and the *content* conditions in summary writing quality?

For the first research question on the main *format* effects, the combined average score for both the politics and ballet summaries in the verbal (underline) format was 14.73 (SD = 2.63),

and the combined average score for both the politics and ballet summaries in the visual (pictorial map) format was 16.12 (SD = 2.62). The mean score difference between these two format conditions was 1.39 points higher for the visual treatment group than the verbal treatment group. The independent-samples *t* test results indicated a significant mean score difference between the two format conditions [$t(64)=2.15$, $p=0.04$] with a medium effect size ($d = 0.53$). Table 7 shows the comparison of summary writing scores for the verbal format (underline) and the visual format (pictorial map) treatments.

Table 7

Summary Writing Scores for Verbal and Visual Formats

Variable	*n*	M	SD	*t*	*df*	*p*
Verbal Format (Underline)				2.15	64	0.04
High-Interest Content (Politics)	33	15.00	2.48			
Low-Interest Content (Ballet)	33	14.45	2.78			
Combined	66	14.73	2.63			
Visual Format (Pictorial Map)						
High-Interest Content (Politics)	33	16.61	2.23			
Low-Interest Content (Ballet)	33	15.64	2.91			
Combined	66	16.12	2.62			

For the second research question on the main *content* effects, the combined average score of the high-interest *content* (politics) summaries from both the verbal (underline) and visual (pictorial map) format treatments was 15.80 (SD = 2.48), and the combined average score of the low-interest *content* (ballet) summaries from both the verbal and visual format treatments was 15.05 (SD = 2.89). The mean score difference between the two content conditions was 0.76 points higher for the high-interest contents (politics) summaries in both groups than for the low-interest content (ballet) summaries in both groups; however, the paired-samples *t* test results for these two correlated groups indicated no significant mean score difference between the two content conditions [$t(65)=1.68$, $p=0.10$]. Table 8 shows the comparison of summary writing

scores for the high-interest content (politics) passage and the low-interest content (ballet) passage from the verbal (underline) and visual (pictorial map) format groups.

Table 8

Summary Writing Scores for High-Interest and Low-Interest Content

Variable	*n*	M	SD	*t*	*df*	*p*
				1.62	65*	0.10
High-Interest Content (Politics)						
Verbal Format (underline)	33	15.00	2.48			
Visual Format (pictorial map)	33	16.61	2.23			
Combined	66	15.80	2.48			
Low-Interest Content (Ballet)						
Verbal Format (underline)	33	14.45	2.78			
Visual Format (pictorial map)	33	15.64	2.91			
Combined	66	15.05	2.89			

Note: * indicates paired-samples *t* test for students (n = 66) in the same correlated groups.

For the third research question on the *interaction* effects of the *content* and *format* conditions, the summary writing scores were compared in four pairs of interactions: (1) the *high-interest* politics summaries (content) in the *verbal* treatment (format) were compared to the politics summaries (content) in the *visual* treatment (format); (2) the *low-interest* ballet summaries (content) in the *verbal* treatment (format) were compared to the ballet summaries (content) in the *visual* treatment (format); (3) the *high-interest* politics summaries (content) were compared to the *low-interest* ballet summaries (content) within the same *verbal* treatment (format); and (4) the *high-interest* politics summaries (content) were compared to the *low-interest* ballet summaries (content) within the same *visual* treatment (format).

For the *first interaction* effect, the average summary writing score for the high-interest content (politics) passage in the verbal format treatment was 15.00 (SD 2.48), and the average score for politics in the visual treatment was 16.61 (SD 2.23). The mean difference between the summary scores of the politics passage in the two format conditions was 1.61 points higher for

the visual treatment than the verbal. The independent-samples *t* test results indicated a significant mean difference between the visual and verbal format treatments [$t(64)=2.76$, $p=0.01$] with a medium effect size ($d = 0.68$).

For the *second interaction* effect, the average summary writing score for the low-interest content (ballet) passage in the verbal format treatment was 14.45 (SD 2.78), and the average score for ballet in the visual treatment was 15.64 (SD 2.91). The mean difference between summary scores of the ballet passage in the two format conditions was 1.18 points higher for the visual treatment than the verbal; however, the independent-samples *t* test results indicated no significant mean difference in the ballet summaries between the visual and verbal format treatments [$t(64)=1.68$, $p=0.10$].

For the *third interaction* effect, the average summary writing score for the high-interest content (politics) passage was 15.00 (SD 2.48), and the average score for the low-interest content (ballet) passage was 14.45 (SD 2.78) within the same verbal format treatment. The mean difference between the summary scores of the politics and ballet passages was 0.55 points higher for politics than ballet; however, the paired-samples *t* test results indicated no significant mean difference between the high-interest politics and the low-interest ballet summaries within the same verbal format treatment [$t(32)=.82$, $p=0.42$].

For the *fourth interaction* effect, the average summary writing score for the high-interest content (politics) passage was 16.61 (SD 2.23), and the average score for low-interest content (ballet) passage was 15.64 (SD 2.91) within the same visual treatment. The mean difference between the summary scores for the politics and ballet passages was 0.97 points higher for politics than ballet; however, the paired-samples *t* test results indicated no significant mean

difference between the high-interest politics and the low-interest ballet summaries within the same visual format treatment [$t(32)=1.59$, $p=0.12$].

Table 9 shows the four interaction effects of the high-interest and low-interest *content* conditions and the verbal and visual *format* conditions.

Table 9

Summary Writing Scores for Interaction Effects of High-Interest and Low-Interest Content for Verbal and Visual Formats

Variable	*n*	M	SD	*t*	*df*	*p*
High-Interest Content (Politics)				2.76	64	0.01
Verbal Format (Underline)	33	15.00	2.48			
Visual Format (Pictorial Map)	33	16.61	2.23			
Mean Difference		1.61				
Low-Interest Content (Ballet)				1.68	64	0.10
Verbal Format (Underline)	33	14.45	2.78			
Visual Format (Pictorial Map)	33	15.64	2.91			
Mean Difference		1.18				
Verbal Format (Underline)				0.82	32*	0.42
High-Interest (Politics)	33	15.00	2.48			
Low-Interest (Ballet)	33	14.45	2.78			
Mean Difference		0.55				
Visual Format (Pictorial Map)				1.59	32*	0.12
High-Interest (Politics)	33	16.61	2.23			
Low-Interest (Ballet)	33	15.64	2.91			
Mean Difference		0.97				

Note: * indicates paired-samples *t* test for students (n = 33) within the same format group.

As stated earlier in this chapter, the summaries in the two *content* conditions (high-interest politics and low-interest ballet) were evaluated and scored for quality using the five criteria of the *Grading Rubric for Summaries*: (1) main ideas, (2) accurate, (3) words and style, (4) concisely organized, and (5) length (see Appendix C). Each criteria had an individual score (range = 1 to 4 points) that, when added together, equaled a cumulative summary quality score (range = 5 to 20 points). The cumulative quality score was the dependent variable that measured the content, format, and interaction effects of the independent variables (treatments). In addition to the cumulative quality scores, this researcher compared each criterion mean score under the

four conditions (verbal format versus visual format, and high-interest content versus low-interest content) to identify any significant effects among the five criteria. The means and standard deviations for each criterion in the content and format conditions were calculated, and the results were compared. Table 10 shows the means and standard deviations for each criterion of the cumulative summary writing scores in the two format conditions and the two content conditions.

Table 10

Means and Standard Deviations of Summary Writing Criteria Scores by Verbal and Visual Groups with High-Interest and Low-Interest Topics

Criteria for Summaries	Verbal Format Group		Visual Format Group	
	High-Interest Politics	Low-Interest Ballet	High-Interest Politics	Low-Interest Ballet
(1) MAIN IDEAS Captures only main ideas of original text.	2.58 (1.00)	2.36 (0.82)	3.12 (0.74)	2.85 (0.97)
(2) ACCURATE Reflects meaning without distorting or slanting information.	2.97 (1.10)	2.79 (0.99)	3.27 (0.84)	2.76 (0.97)
(3) WORDS AND STYLE Written in own words and sentence structure.	2.88 (0.93)	2.85 (0.94)	3.58 (0.61)	3.52 (0.57)
(4) CONCISELY ORGANIZED Omits unnecessary details from original text and well organized.	3.18 (0.88)	3.15 (0.67)	3.30 (0.73)	3.00 (0.87)
(5) LENGTH Between 1/4 to 1/3 the length of the original text.	3.39 (0.83)	3.30 (0.92)	3.33 (0.54)	3.52 (0.71)
CUMULATIVE SCORE	15.00 (2.49)	14.45 (2.78)	16.61 (2.24)	15.64 (2.91)

Note: Each score ranged from 1 (needs improvement) to 4 (exemplary) for cumulative scores 5 (min) to 20 (max) points.

Of these five quality criteria, the "main ideas" and "words and style" criteria are considered more important in writing a quality summary, according to some researchers (e.g., Jackson, 2006; Roig, 2001). The "main ideas" and "words and style" mean score differences between the verbal and visual formats (i.e., the first research question on main *format* effects) were found to be statistically significant for the high-interest content (politics) and low-interest content (ballet) summaries. In addition, the "accurate" criterion had a statistically significant

mean score difference between the high-interest politics and low-interest ballet summaries *within* the same visual format (i.e., the third research question on *interaction* effects).

For the "main ideas" criterion, the independent-samples *t* test results indicated two significant group mean score differences. First, the politics summaries (M = 3.12, SD = 0.74) in the visual (pictorial map) treatment had a significantly higher mean score compared to the politics summaries (M = 2.58, SD = 1.00) in the verbal (underline/circle text) treatment [$t(64)=2.52$, $p=0.01$] with a medium effect size ($d = 0.61$). Second, the ballet summaries (M = 2.85, SD = 0.97) in the visual (pictorial map) treatment also had a significantly higher mean score compared to the ballet summaries (M = 2.36, SD = 0.82) in the verbal (underline/circle text) treatment [$t(64)=2.19$, $p=0.03$] with a medium effect size ($d = 0.55$).

For the "words and style" criterion, the independent-samples *t* test results indicated two significant group mean score differences. First, the politics summaries (M = 3.58, SD = 0.61) in the visual (pictorial map) treatment had a significantly higher mean score compared to the politics summaries (M = 2.88, SD = 0.93) in the verbal (underline/circle text) treatment [$t(64)=3.60$, $p=0.01$] with a large effect size ($d = 0.89$). Second, the ballet summaries (M = 3.52, SD = 0.57) in the visual (pictorial map) treatment also had a significantly higher mean score compared to the ballet summaries (M = 2.85, SD = 0.94) in the verbal (underline/circle text) treatment [$t(64)=3.49$, $p=0.01$] with a large effect size ($d = 0.86$).

Based on the "main ideas" and "words and style" results, the visual (pictorial map) treatment was found to be a more effective instructional format than the verbal (underline/circle text) treatment in these two important criteria of summary writing quality.

For the "accurate" criterion of summary quality *within* the visual (pictorial map) treatment, students wrote better high-interest (politics) summaries, which reflected the "meaning

without distorting or slanting information" of the source passage, than low-interest (ballet) summaries. The paired-samples *t* test indicated a significant mean score difference between the politics summaries (M = 3.27, SD = 0.84) and the ballet summaries (M = 2.76, SD = 0.97) within the visual treatment [$t(32)=2.09$, $p=0$ .05] with a medium effect size (d = 0.56).

Table 11 shows the independent-samples *t* test results for the "main idea" and "words and style" criteria scores and the paired-samples *t* test results for the "accuracy" criterion scores.

Table 11

Significant Differences in Criteria Scores for Summary Writing Analysis

Summary Writing Criteria	*n*	M	SD	*t*	*df*	*p*
Main Ideas				2.52	64	0.01
Politics (pictorial map)	33	3.12	0.74			
Politics (underline)	33	2.58	1.00			
Mean difference		0.54				
Main Ideas				2.19	64	0.03
Ballet (pictorial map)	33	2.85	0.97			
Ballet (underline)	33	2.36	0.82			
Mean difference		0.49				
Words and Style				3.60	64	0.01
Politics (pictorial map)	33	3.58	0.61			
Politics (underline)	33	2.88	0.93			
Mean difference		0.70				
Words and Style						
Ballet (pictorial map)	33	3.52	0.57	3.49	64	0.01
Ballet (underline)	33	2.85	0.94			
Mean difference		0.67				
Accuracy				2.09	32*	0.05
Politics (pictorial map)	33	3.27	0.84			
Ballet (pictorial map)	33	2.76	0.97			
Mean difference		0.51				

Note: * indicates paired-samples *t* test of students (n = 33) within the same format treatment.

Satisfaction Survey Results

At the conclusion of both the verbal and visual treatments students responded to an eight-statement satisfaction survey with one optional general *comments* section. This survey helped to interpret and provide insight regarding the summary writing results. Survey statements #3 and #4 related to the main effects of the *format* conditions (underline and pictorial map) on a quality

summary. Statements #1, #2, #5, and #6 related to the main effects of the *content* conditions (high-interest politics and low-interest ballet) on a quality summary. Statement #7 assessed whether the treatments were considered to be good learning tools, and statement #8 focused on the time allowed to complete the tutorials. It should be noted that statements #3 and #4 were worded differently to describe the corresponding format (underline or pictorial map). Table 12 shows the means and standard deviations of the eight statements on a five-point Likert scale from 1 ("strongly disagree") to 5 ("strongly agree") for the verbal and visual format groups.

Table 12

Means and Standard Deviations for Satisfaction Survey by Treatment

Item	Statement	Verbal	Visual
1	The paragraph on politics ($700 billion measure) was easy for me to summarize.	4.06 (0.93)	4.21 (0.93)
2	The paragraph on ballet (Coppelia) was easy for me to summarize.	2.33 (0.85)	2.21 (0.96)
3	The underlining/circling of words helped me to identify the main ideas in the paragraph on politics ($700 billion measure.)	4.36 (0.60)	NA
3	The pictorial map (pictures/lines) helped me to identify main ideas in the paragraph on politics ($700 billion measure).	NA	4.39 (0.83)
4	The underlining/circling of words helped me to identify main ideas in paragraph on ballet (Coppelia).	3.70 (0.92)	NA
4	The pictorial map (pictures/lines) helped me to identify the main ideas in the paragraph on ballet (Coppelia).	NA	3.73 (1.23)
5	I found the paragraph on politics ($700 billion measure) to be interesting.	3.64 (1.05)	3.79 (1.21)
6	I found the paragraph on ballet (Coppelia) to be interesting.	2.42 (1.30)	2.60 (1.41)
7	This tutorial is a good way to learn how to summarize passages.	4.33 (0.69)	4.42 (0.71)
8	I had enough time to write my summaries.	4.67 (0.59)	4.18 (0.98)

In looking at the main *format* effects between the verbal and visual groups, the independent-samples *t* tests found no significant mean differences on statements #3, #4, and #7. However, for statement #8 ("I had enough time to write my summaries"), there was a mean difference of 0.49 points between the groups. The verbal treatment group had an average score

of 4.67 (SD = 0.59), and the visual treatment group had an average score of 4.18 (SD = 0.98). The independent-samples *t* test results indicated a significant mean score difference [*t*(64)2.46, *p*=0.02] with a medium effect size (*d* = 0.61), suggesting that either the visual (pictorial map) group had less than enough time than the verbal (underline/circle text) group to write summaries or had significantly more time to write summaries using the verbal treatment.

In relation to the *interaction* effects of the content and format conditions, the responses to statements #3 and #4 were calculated separately *within* each group. In the verbal treatment group the average score for statement #3 on the politics summary ("underlining/circling of words helped me to identify main ideas") was 4.36 (SD = 0.60), and the average score for a similarly worded statement #4 on the ballet summary was 3.70 (SD = 0.92). The paired-samples *t* test results indicated a significant mean score difference [*t*(32)=4.14, *p*<0.01] with a large effect size (*d* = 0.85) between the politics and ballet summaries. In the visual treatment group the average score for statement #3 on the politics summary ("pictorial map [pictures/lines] helped me to identify main ideas") was 4.39 (SD = 0.83), and the average for a similarly worded statement #4 on the ballet summary was 3.73 (SD = 1.23). The paired-samples *t* test results indicated a significant mean score difference [*t*(32)=3.29, *p*=0.01] with a medium effect size (*d* = 0.63) between the politics and the ballet summaries.

Regarding the *interaction* effects of the content and format conditions, the responses to statements #1 and #2 ("easy for me to summarize") and statements #5 and #6 ("interesting") were calculated separately *within* each treatment group. For statements #1 and #2 ("easy") in the *verbal* group, the average score for the politics summary was 4.06 (SD = 0.93), and the average score for ballet was 2.33 (SD = 0.85). The paired-samples *t* test results indicated a significant mean score difference between the politics and ballet summaries [*t*(32)=7.10, *p*<0.01] and a large

effect size (d = 1.94). For statements #1 and #2 in the *visual* group, the average score for the politics summary was 4.21 (SD = 0.93), and the average score for ballet was 2.21 (SD = 0.96). The paired samples t test indicated a significant mean score difference between the summaries [$t(32)=8.00$, $p<0.01$] with a large effect size (d = 2.17). For statements #5 and #6 in the *verbal* group, the average score for the politics summary was 3.64 (SD = 1.05), and the average score for ballet was 2.42 (SD = 1.30). The paired-samples t test results indicated a significant mean score difference between the summaries [$t(32)=4.16$, $p<0.01$] with a large effect size (d = 1.03). For statements #5 and #6 in the *visual* group, the average score for the politics summary was 3.79 (SD = 1.21), and the average for ballet was 2.61 (SD = 1.41). The paired-samples t test results indicated a significant mean difference between the politics and ballet summaries [$t(32)=3.46$, $p=0.01$] with a large effect size (d = 0.90). These results suggested that students' topic interest in the source passage contents impacts their perceived difficulty in reading the passage during the summary writing process in both formats (verbal and visual).

The last item in the satisfaction survey was an open-ended statement: "Your comments are appreciated in the space below." The response rate for this statement was 88% (58 out of 66 participants). All handwritten comments were typed and organized according to code numbers and treatment formats. The major themes were identified, and the comments were sorted and further divided into a list of 85 items grouped under five thematic categories: (1) comments related to the format condition, (2) comments related to the content condition, (3) positive comments on both tutorial treatments, (4) negative comments and suggested improvements for both tutorial treatments, and (5) general feedback (see Appendix K). This researcher then analyzed each comment related to the emergent themes.

In the first thematic category on the *format* condition, six of the seven comments focused on the visual treatment. Students noted that the pictorial map was helpful, but they also pointed out the following weaknesses or preferences: (1) organizing sentences was more difficult; (2) being able to look at the source passage rather than only the pictorial map would have been helpful in writing the summaries; and (3) being able to circle key words would have been preferred. In the second thematic category on the *content* condition, 8 of the 14 total comments described the ballet passage as being problematic in a variety of ways: the ballet passage was "difficult, confusing, uninteresting, convoluted, complex, disliked, not understandable, hard to summarize due to description, and not relatable." These comments on the content condition suggest some support of the theoretical framework for the second research question of this study indicating a relationship between topic interest and reading comprehension.

Forty percent (n = 34) of the 85 items were included under the third thematic category as positive comments about both treatments. The tutorial treatments were described as "helpful, practical, easy to understand, valuable as a learning tool, interesting, fun, and having clear and concise instructions." Only 18% (n = 15) of the 85 items were in the fourth thematic category as negative comments about both treatments, and the majority of these comments focused on the lack of instructional feedback on the posttest for summarization knowledge, too much time allotted for the verbal treatment, and too little time allotted for the visual treatment. The fifth thematic category for general comments included 18% (n = 15) of the total items. All comments in this general category were positive, and they indicated that previous training in summarizing was never or rarely taught in school and that more instruction on how to summarize text was needed. These general comments from both treatment groups appeared to be consistent with studies in the literature review chapter of this study, attributing the lack of formal instruction in

summary writing to factors such as the absence of standardized rubrics, non-uniformity and misinformation on summary writing expectations and plagiarism, and the time commitment required for instructor grading and feedback.

Summary of Major Findings

This chapter presented the findings for three research questions, including results from the summarization knowledge pretests and posttests, summary writing rubric scores, and satisfaction surveys. A summary of the major findings are summarized and grouped below.

1. What were the *main* effects of the two *format* conditions on the quality of a summary? (Research Question #1)
    a. Students in the visual format group (pictorial map) wrote significantly better quality summaries than students in the verbal format group (underline/circle text).
    b. Students in the visual format group (pictorial map) wrote significantly better quality summaries than students in the verbal format group (underline/circle text) in two important criteria of a quality summary: (1) main ideas and (2) words and style.
    c. Students in both format groups (pictorial map and underline/circle text) scored significantly higher in their summarization knowledge posttest tests than in their pretests.
2. What were the *main* effects of the two *content* conditions on the quality of a summary? (Research Question #2)

    Students did not write significantly better summaries for the high-interest politics contents than for the low-interest ballet contents in either treatment group.

3. What are the *interaction* effects of the *format* conditions and the *content* condition on the quality of a summary? (Research Question #3)
    a. Students in the visual format group (pictorial map) wrote significantly better high-interest politics (content) summaries than students in the verbal format group (underline/circle text).
    b. Students in the visual format group (pictorial map) wrote significantly "more accurate" politics (content) summaries than ballet (content) summaries.
4. The majority of students responded positively in the post-treatment satisfaction surveys that both tutorials were valuable in learning how to write summaries.
    a. Students in each treatment group reported on the post-treatment satisfaction surveys that the format condition (pictorial map and underline/circle text) helped them significantly to better "identify the main ideas" in the high-interest politics summary than in the low-interest ballet summary.
    b. Students in each treatment group (format) reported on the post-treatment satisfaction surveys that the high-interest politics (content) passage was significantly "easier to summarize" and significantly "more interesting" than the low-interest ballet (content) passage.

In the following chapter this researcher further examines these major findings and how they contribute to the ongoing research on summarization. Finally, the substantive meaning of these results will be discussed in relation to their impact on instructional practices.

CHAPTER V

SUMMARY, LIMITATIONS, DISCUSSION AND IMPLICATIONS

This chapter presents a summary of the study and an overview of the research problem with its rationale and purpose, and then offers a summary of findings, discussion of findings, limitations, conclusion, and implications for research and practice.

Summary of Study

The empirical research correlates college students' misunderstanding of summarization standards with inadvertent plagiarism (e.g., Roig, 1997, 1999). Even when students are instructed in recognizing citation errors and learning summarization rules however, they continue to inadvertently plagiarize by not restating a source passage (e.g., Landau, Druen, & Arcuri, 2002). Many college students mistakenly believe that if they simply acknowledge the original author, rather than restate the text in their own words and writing style, they have done enough to avoid plagiarism when summarizing or paraphrasing (Roig, 2001). As a result, many students will merely reposition or change a few words while retaining the author's original sentence structure and voice. Also contributing to this problem is that many students have not learned they must clearly understand the main ideas of a source passage first before they can accurately restate and summarize the text in their own words and writing style (Jackson, 2006).

Instruction in which college students learn to restate text rather than only recognize proper citations is more effective in preventing accidental copying (e.g., Roig, 1999; Shuetze, 2004). This improved method of instruction typically asks students to read an original text passage until they understand it, and then to underline, circle, or highlight the main ideas prior to writing the summary or paraphrase. However, summarization also involves a complex strategy in which the writer must select, reduce, reword, reorganize, and accurately represent the original meaning in order to restate the text (Anderson & Hidi, 1988). The first stage of this process requires the accurate recall and comprehension of core meaning, which may prove troublesome when the meaning of a passage is not obvious from the surface structure (van Dijk & Kintsch, 1983).

Research has shown that many college students still have developmental problems in using these complex cognitive strategies to comprehend and restate text in their own words (e.g., Wade-Stein & Kintch, 2004). Many studies also have found that visual strategies, such as images and concept maps, significantly increase comprehension of conceptual relationships more than non-visual strategies (e.g., Chmielewski & Dansereu, 1998; David, 1998; Sadoski, 2005; Waddill & McDaniel, 1992, 1993; Zillman, Knobloch, & Yu, 2001). Therefore, in this researcher's review of freely available instructional tools (see Appendix A), it was surprising to discover that visual scaffolds used to help primary and secondary school students condense and prioritize information are rare in college instruction guides (e.g., Clarke, Flaherty, & Yankey, 2006).

The pictorial map in this study was developed by this researcher as the key visual strategy to initially guide college students in comprehending the main ideas and contextual relationships of a source passage. Based on empirical research, this strategy

helps students to engage cognitively with a visual structure representing the text, and it is comprised of images, text labels, and linked lines (e.g., Chang, Chiao, Hsiao, & Chen, 2000; Schnotz, 2002; Yin, Vanides, Ruiz-Primo, & Ayala, 2005). However, the specific features of the treatment variables in this study differed from other visual strategies tested in reading and summary writing research (e.g., Chang, Sung, & Chen, 2002). This also was the first quasi-experiment to study if a pictorial map treatment—comprised of journalism questions (who, what, where, when, why, how), directional lines, and representative images—would produce better summaries than the customary text-based treatments (underline/circle text) found in college instruction.

Topic interest in the source passage was the second manipulated treatment variable of this study. Research has found that students who are more cognitively engaged with reading due to their interest in the content have improved recall and better comprehension (e.g., Guthrie & Wigfield, 2000; Schiefele & Krapp, 1996). Therefore, this experiment compared the effects a high-interest (politics) and a low-interest (ballet) source passage on the quality of a student's summary. In addition, interest may be generated by factors such as novelty or intensity and must be maintained to empower the learning process. Therefore, the pictorial map also may have partially functioned as a "catching" mechanism, analogous to math puzzles in Mitchell's (1993) study, to grab the attention of readers with differing levels of topic interest as well as a "holding" scaffold to bridge the interest or knowledge gaps that may affect comprehension (Boscolo & Mason, 2003).

This study consisted of college students from intact classes who were given either a control tutorial in which they underlined or circled the main ideas of a source passage

or an experimental tutorial in which they filled in partial text blanks of a pictorial map representing the main ideas of a source passage (see Appendixes D and E). The overarching intent of this quasi-experiment was to explore and develop an effective instructional method for teaching college students how to properly summarize a source passage. The rubric used to rate the quality of the summaries was based on empirical research (Jackson, 2006; Roig, 2006) and developed by this researcher. It consisted of five criteria: main ideas, accuracy, restated words and writing style, conciseness, and length (see Appendix C).

This study was significant for several reasons. It sought to address the widespread problem of inadvertent plagiarism caused by inconsistent instruction, vaguely written style guides, misunderstood rules and expectations, and inadequate modeling by teachers (e.g., Roig, 2001). It integrated effective visual strategies from the reading research on how to produce better quality summaries through understanding main ideas and the propositional relationships of source text (e.g., Rubman & Waters, 2000). Finally, it provided a new scaffolding tool (pictorial map) in summary instruction for college students who may have different reading abilities, subject-matter knowledge, and topic interests (e.g., Reader & Hammond, 1994).

Dual coding and cognitive load formed the theoretical rationale for this study. According to dual coding theory, learners process incoming sensory information in two channels: a verbal channel for language and a non-verbal channel for images (Clarke & Paivio, 1991). Both channels create mental codes for representing and organizing knowledge. These codes are linked through different processing connections (representational, referential, and associative) enabling learners to create images when

reading text or hear words to construct descriptions when seeing pictures. In this experiment, when students were presented with a pictorial map of key ideas, the interconnections of the coding systems allow students to visualize ideas and their relationships to other linked ideas. Pictorial maps therefore benefit students with either low-skill or high-skill reading levels by visually enhancing their perception of key ideas and their relationships to other ideas (e.g., Levin & Mayer, 1993). A pictorial map also benefits students with less interest in a passage or with weak summary skills by triggering their own semantic associations in memory that may vary to some degree from the original text and thus inhibit tendencies to inadvertently copy the text (Hibbing & Rankin-Erickson, 2003).

According to cognitive load theory, learners have limited working memory but an unlimited capacity in long-term memory (Sweller, 1988). An instructional designer should accommodate these limitations and different cognitive loads (i.e., intrinsic, extraneous, and germane) so multiple demands from the learning task can be processed (e.g., Sweller, 1999, 2005; Van Merrienboer & Sweller, 2005). When the cognitive demands of instruction leave resources in working memory, as this experimental treatment attempted to achieve, students may be motivated to engage more actively in the learning process.

With well designed instruction, students do not exhaust their limited working memory doing irrelevant or multiple tasks, and they are left with more resources for learning. Research related to this study found that ineffective cognitive demands (i.e., extraneous load) were reduced when text and picture representations were well integrated, and instruction was not redundant (e.g., Mousavi, Low, & Sweller, 1995).

Extraneous load also is reduced when scaffolds guide the instruction and assist students in concentrating on the inherent task to be learned (i.e., intrinsic load).

In this study a partially completed pictorial map acted as the scaffold to increase cognitive resources (i.e., germane load) and automate memory schemas to allow complex learning. The pictorial map may provide the visual model for missing or partial schema brought into working memory while reading unfamiliar or less interesting text. Being more aware of the visual model, students may be more primed to use their own associative wording and natural writing style when summarizing a source passage. In contrast, instruction based solely on a verbal model (i.e., underline/circle main ideas) may be insufficient to scaffold the summarizing task, resulting in expedient and inappropriate strategies such as copying the text.

The purpose of this quasi-experimental study was to determine if a pictorial map is, in fact, a better instructional strategy for writing a summary than underlining or circling the main ideas of a source passage. The secondary purpose was to explore how a student's interest in a source passage impacts the quality of a summary. This study addressed three research questions:

1. What are the differences in the *main* effects of the two *format* conditions—a partially completed pictorial map (visual) and an underlining/circling of main ideas (verbal)—on the quality of a summary?
2. What are the differences in the *main* effects of the two *content* conditions—a politics passage (high interest) and a ballet passage (low interest)—on the quality of a summary?

3. What are the differences in the *interaction* effects of the two *format* conditions (visual and verbal) and the two *content* conditions (high-interest and low-interest topics) on the quality of a summary?

Summary of Findings

For all statistical tests related to the research questions, the level of significance was set at the .05 level. For the first research question on the main effects of the *format* condition, this study found two significant differences between the visual format condition (pictorial map) and the verbal format condition (underline/circle text). First, students in the visual format group wrote better quality summaries ($d = 0.53$) for both the high-interest politics and the low-interest ballet passages than students in the verbal format group. Second, students in the visual format group also scored higher than the verbal format group in the two important criteria that measured summary quality ("main ideas" and "words and style"). For the high-interest politics summary, the "main ideas" were captured better in the visual format than in the verbal format ($d = 0.61$). Likewise, for the low-interest ballet summary, the "main ideas" were captured better in the visual format ($d = 0.55$). For the politics summary, the "words and style" were written better in the visual format than in the verbal format ($d = 0.89$). Similarly, for the low-interest ballet summary, the "words and style" were written better in the visual format than in the verbal format ($d = 0.86$).

For the second research question on the main effects of the two *content* conditions, this study found that students did not write significantly better quality high-interest politics summaries than low-interest ballet summaries in both format conditions.

For the third research question on the *interaction* effects of the *format* and *content* conditions, this study found two statistically significant differences. First, students in the visual format group wrote better politics summaries than the students in the verbal format group ($d = 0.68$). Second, students in the visual format group (pictorial map) scored higher ($d = 0.56$) on the specific quality criterion measuring accuracy (i.e., "reflects meaning without distorting or slanting information") for their politics summary than for their ballet summary.

In addition, the students in both treatment conditions (pictorial map and underline/circle text) significantly increased their posttest summarization knowledge scores. When the effects of the visual and verbal treatments on the post-treatment summarization knowledge tests were analyzed, students in the visual ($d = 1.40$) and verbal ($d = 1.75$) groups had significantly improved their scores compared to their pre-treatment tests. However, there was no significant difference between the visual group and the verbal group in their improved posttest scores. It was therefore concluded that neither treatment was better than the other for improving summarization knowledge.

On the post-treatment satisfaction surveys, the students in the verbal format group ($d = 0.85$) and the visual format group ($d = 0.63$) each reported that their respective format conditions helped them to better "identify the main ideas" of the high-interest politics summary compared to the low-interest ballet summary. The students in the verbal format group reported that the high-interest passage (politics) was "easier to summarize" ($d = 1.94$) and "more interesting" ($d = 1.03$) than the low-interest passage (ballet). Similarly, students in the visual format group reported that the high-interest passage (politics) was "easier to summarize" ($d = 2.17$) and "more interesting" ($d = 0.90$)

than the low-interest passage (ballet). Approximately 85% of the responses (n=70) in the optional "comment" section (i.e., "Your comments are appreciated in the space below.") were positive about the value of both *format* treatments in learning how to write summaries. However, 57% of the optional "comment" responses (n=14) that focused only on the *content* variable described the low-interest passage (ballet) in negative terms (e.g., "difficult, confusing, uninteresting, convoluted, complex, disliked, not understandable, hard to summarize, not relatable"). Although these negative comments from participants suggest a relationship between the low-interest *content* (ballet) and the quality of the summaries, the ballet summaries were not, in fact, significantly different than the politics summaries in respect to their quality.

Discussion of Findings

In this study students wrote significantly better quality summaries (d = 0.53) using a visual strategy (pictorial map) than using a verbal strategy (underlining/circling text). This finding is consistent with previous research in four related areas: reading, summarization, plagiarism, and instructional design. First, the reading research has consistently found that visual strategies, such as pictures and maps, improve recall and comprehension more than non-visual strategies (e.g., Chmielewski & Dansereu, 1998; David, 1998; O'Donnell, Dansereau, & Hall, 2002; Sadoski, 2001, 2005). Second, the summarization research provides empirical evidence that reading scaffolds, such as partially completed text and picture labels as well as mapping, are useful strategies that help students attend to idea units, details, and relational propositions when they construct summaries (e.g., Chang, Chiao, Hsiao, & Chen, 2000; Chang, Sung, & Chen, 2002;

Katayama and Robinson, 2000; Schnotz, 2002). Third, the empirical research in plagiarism has correlated instructional practice in restating text, as opposed to simply identifying and correcting citation problems, with increased skills in avoiding inadvertent plagiarism (e.g., Barry, 2006; Jackson, 2006; Roig, 1997; Schuetze, 2004; Walker, 2008). Fourth, instructional design studies have found that integrating pictures with text in scaffolds reduces extraneous load in acquiring complex cognitive skills such as reading comprehension and summarization (e.g., Ayala, 2005; Chandler & Sweller, 1991; Hmelo-Silver, 2006).

The results of this experiment bridged the findings of several studies in two previously mentioned research areas. In regard to the summarization research examining the effects of scaffolds, Chang, Sung, and Chen (2002) used computer-generated concept maps along with extensive training to study the effects of different scaffolds on reading comprehension and written summaries (Chang, Sung, & Chen, 2002). This experiment built on the prior research of Chang, Sung, and Chen by using (1) college students instead of 5th grade Taiwanese students, (2) paper-based pictorial maps instead of computer-generated hierarchical concept maps, (3) one-and-half-hour tutorial rather than seven weeks of training, and (4) English instead of Chinese passages. In regard to plagiarism research, this experiment extended the treatment methodology of Jackson (2006) and Roig (1997) by comparing the effects of visual and verbal instruction on how to write summaries rather than comparing the effects of citation correction and restatement instruction on how to prevent inadvertent copying. This empirical study also bridged a gap between the current research in summarization and plagiarism instruction by introducing different scaffold strategies (i.e., visual and verbal) as adjuncts for

comprehending a source passage and writing an accurate first-draft summary. In addition, this was the first study to examine the effects of a new adjunct in summary writing instruction: a pictorial map composed of images, directional lines, and partially completed labels within an organizational framework of journalism questions (who, what, where, when, why, how).

This researcher analyzed the results for each of the five criteria that measured the quality of the summaries written by both treatment groups. The analysis uncovered three noteworthy interactions between the format variable and three summary quality criteria: (1) "main ideas"—captures only the main ideas of original text, (2) "words and style"—written in one's own words and sentence structure, and (3) "accuracy"—reflects meaning without distorting or slanting information. For the "main ideas" criteria, students in the visual group had significantly better results than the verbal group for the politics and ballet summaries in capturing the main ideas of the original text. The "main idea" results were consistent with Rewey, Dansereau, and Peel (1991) who found that students using a knowledge map to summarize text recognized more central ideas in a subsequent multiple-choice test than students who summarized by only rereading the text. The "main idea" results also supported David (1998) who found that college students recalled more main ideas under text-and-photo conditions than text-only conditions. However, this study also introduced six journalism questions within the pictorial map framework that were not used in the knowledge maps or photos of prior studies. The additional influence of these journalism questions (who, what, where, when, why, how) must therefore be considered as possible contributors to reading comprehension and identifying the main ideas of the source text.

No previous study has examined the effect of verbal and visual adjuncts on the specific criterion of restating text in one's "own words and sentence structure," so this researcher concluded that the significant improvement in this quality criterion by the visual group may be explained through cognitive load theory. The pictorial map in the visual treatment acted as a scaffold that reduced extraneous load, and then automated or completed any partial schemas the students brought into working memory. These schemas, in turn, freed up cognitive resources and primed students to be more inclined to use their own words and natural writing styles in their summaries.

For the writing criterion of "accuracy," students in the visual treatment group had significantly higher scores on the politics summary than on the ballet summary. This result is consistent with the research on how graphic organizers influence relational knowledge (i.e., superordinate and subordinate concepts). Reading comprehension research has found that one identifies significantly more relational concepts from expository text supplemented with a graphic organizer (e.g., Kools, van de Wiel, Ruiter, Cruts, and Kok, 2006; DiCecco & Gleason, 2002). Likewise, the pictorial map in this study was the graphic organizer for the expository text (politics and ballet), and it may have contributed to significantly higher "accuracy" scores for the politics passage, a construct similar to "relational knowledge," which is defined as being dependent on the accurate relationships between major and minor concepts. For an "accurate" summary, the key ideas of the source passage must be selected or created, and the details must be eliminated or collapsed, and ranked in terms of relevance and importance (i.e., relational knowledge).

Why did the visual treatment group write significantly more accurate summaries for politics than ballet? The answer may be attributed to some lack of interest or perceived difficulty in the content, as reported in the post treatment satisfaction surveys (see Appendix K). On the other hand, research indicates that the nature of the photos themselves may influence the accuracy of a summary. For example, David (1998) found a significant positive correlation between a photo's vividness and reader interest and comprehension. Levin, Anglin, and Carney (1987) found correlations between detailed photos (i.e., explicit, concrete) and inferential photos (i.e., relationships with people, events, issues) and a reader's interest and comprehension. Brosius, Donsbach, and Birk (1996) also identified significant correlations between pictures that clearly describe a specific news item, and are well matched, as opposed to standard pictures that only suggest or indirectly refer to items in the article. In this study, the public-domain images in the pictorial maps were selected by this researcher from a small pilot study of students who had similar academic backgrounds as the treatment groups (see Appendix G). An equal number of detailed and inferential images were then used in the pictorial maps representing the ballet and politics passages.

After completing the tutorials, students in both treatment groups also significantly increased their summarization knowledge which was measured by comparing their average pretest and posttest scores. This improvement, along with the 85% positive comments from students about how much they valued the treatments, showed that the students' favorable perceptions of the treatments actually matched the summary skill benefits they derived from the experiment. These attitudinal and empirical results also suggested that the step-by-step instructional design and contents of both treatments were

more effective than college tutorials that focus primarily on correcting faulty beliefs about plagiarism (Jackson, 2006; Roig,1997).

A limitation of both the Jackson (2006) and the Roig (1997) research was that they used only one instructional strategy to teach summarization skills (e.g., Hidi & Anderson, 1987); namely, the "rules and best practices" strategy to condense and restate text. Based on the favorable results of this study however, this researcher concluded that their approach, common in popular college guides and textbooks (e.g., Hacker & Simmons, 2011), has instructional shortcomings. Jackson and Roig may have achieved different (and possibly more favorable) results had they incorporated other instructional design approaches such as emphasizing reading comprehension in the summarization process and using graphic organizers in conjunction with the summarization process (e.g., David, 1998; Sadoski, 2001)..

Unlike Jackson (2006) and Roig (1997), this experiment integrated three approaches to teach summarization by (1) emphasizing the relationship between reading comprehension and writing a first-draft summary, (2) designing a partially completed pictorial map as the graphic organizer, and (3) providing step-by-step information on summarization rules and best practices. These additional design features may have accounted for the significant improvement in summarization scores and the high satisfaction ratings among students in this study. It also is interesting to note—in contrast with the discouraging student results in Jackson's and Roig's studies—that the biggest improvements in post-treatment summarization knowledge scores (increases from 27.8% to 75.8% for correct answers) were found in three key areas. Students learned that (1) a paragraph summary should be only about 1/4 to 1/3 the length of original, (2) a quality

summary should restate the main ideas of the source text in one's own writing style; and they were able to (3) select the most well written summary from three options.

According to the topic interest research, students in this study were expected to write better quality summaries for passages in which they had greater interest and/or knowledge (e.g., Guthrie & Wigfield, 2000; Schiefele & Krapp, 1996). This researcher also had proposed that students would write better summaries using a visual treatment due to the novel "catch and hold" features of a pictorial map (Michell, 1993). The findings, however, only partially supported this hypothesis. The average politics summary (high interest) was significantly better in quality than the average ballet summary (low-interest) only for the visual treatment group, but an overall difference in quality between the politics and the ballet summaries which was attributable to the interest variable alone was not statistically significant (i.e., research question two). It may be reasonable to suggest, however, that content interest and subject knowledge were contributing factors in the quality of the summaries. This conclusion is based partially on the post-treatment surveys from both groups in which students described the politics passage as "easier to summarize" and "more interesting" than ballet, and a moderately high percentage of "comment" responses (57%) negatively describing the ballet passage as complex and uninteresting (see Appendix K).

Limitations

This quasi-experimental study was limited by seven factors: sample composition, sample size, source passage order, source passage interpretations, picture interpretations, map complexity, and the note-taking process.

The first limiting factor was the composition of the sample. The sample population was comprised of four intact groups of college students in four different courses taught by this researcher at two major non-profit, accredited universities in Northern California. However, each student in the four intact groups was randomly assigned to one of the two treatments that comprised the two larger comparison groups for this study. The comparison groups were the same size (n = 33) and had an equal number of students from each institution (n = 33). The pre-treatment summarization test (see Appendixes D and E) of all students found no significant statistical difference between the comparison groups in understanding summarizing principles. The comparison groups were therefore considered equivalent in their summary writing skills, and each of the four different courses listed composition skills (e.g., summarizing) as one of their learning objectives. Moreover, the sample population reflected the national profile for non-traditional adult learners in regard to gender (36%=men, 64%=women) and age (58%=≤39 years old, 42%=≥40 years old), according to the publication Adult Learners in Higher Education (2007). These factors allowed the researcher to conceptualize the statistical results and conclusions based on this sample to the abstract population of college writing students.

A second limiting factor was the relatively small sample size (n=66) that affected the statistical power of the experiment. Despite this limitation, however, several research design elements and conditions were implemented to reduce or remove contaminating variables and increase the statistical and practical power of this study. First, this researcher was present at each site and spoke to all students in the intact groups from a standard script that explained the purpose of the study and how it fit into the course

objectives. Second, this researcher proctored all experimental groups (i.e., pictorial maps), while the assistants, whom the researcher had trained, proctored all control groups (i.e., underlining/circling text) in separate, adjoining classrooms. Although participation was voluntary, all students chose to participate, thus eliminating administrative distractions. Furthermore, the assistants as well as this researcher followed a written script to ensure that students adhered to the treatment guidelines and the time limits of the experiment (see Appendix I).

A third limiting factor was that the order of the source passages in the treatments was not counter-balanced. In both treatments, the politics passage preceded the ballet passage. The order of presentation may therefore account for a potentially better performance on the second passage simply due to prior practice with the first passage. However, this researcher intentionally used the order of the source passages in the treatment design as a scaffold for students to learn a new, multi-step summary writing process. With the politics passage presented first, students had the opportunity to summarize a topic typically perceived as more interesting prior to working on a topic of lesser interest, according to the interest rankings of previous pilot studies with similar students (see Appendix B).

A fourth limiting factor related to the interpretation of the source passages for summary writing. Oftentimes in literature there is a purposeful natural ambiguity of text that precludes having only one interpretation. Students' ability to formulate multiple interpretations of literary passages is, in fact, a desired learning outcome in most literature courses. However, due to the straightforward expository style of the passages

in this study, there was no intent to capture alternative interpretations, and the limitation was considered beyond the scope of this study.

A fifth limiting factor concerned the interpretation of pictorial images. The images selected in this study were capable of limiting or skewing the interpretation of the source passages. It also is possible that particular images in this study may even have had negative effects on students' ability to accurately interpret the source passages. However, this researcher addressed this limitation by using favorable images selected by college students in a previous pilot study who had the same characteristics of the intact groups participating in this study. Students in the previous pilot study had rated an array of images on a Likert scale for how well each image represented a corresponding idea in the source passages (see Appendix G).

A sixth limiting factor was that the perceived complexity of the pictorial maps may have hampered students' interpretation of source passages in the visual treatment. As illustrated in Chapter Two, Graphic Strategies and Methodological Problems, some visual designs may be rather complex and require some training in order to interpret them accurately (e.g., knowledge maps). However, to address the limitation, this researcher designed pictorial maps that had relatively simple, straightforward visual features and wording. Students also had time to practice using a pictorial map to interpret an introductory passage prior to summarizing the source text in the visual format treatment.

The seventh limiting factor was that both the verbal and visual format treatments specifically instructed students to "not write notes" while summarizing the passages, and this instruction may have curtailed some routine ways to process text. Although the "no note-taking" instruction is a valid concern, this researcher assumed that most students in

this study were novices in their summarizing ability and wanted to provide only one clear strategy for all students. In fact, based on expertise reversal effect theory, allowing notes for students who may already be experienced note-takers might be redundant guidance that placed unnecessary, excessive load on their working memory resources and would become counter-productive (Kaluga, Ayres, Chandler, & Sweller, 2003).

Conclusions

This study contributes to the learning and instruction literature by providing empirical evidence that a *visual* (pictorial map) tutorial was significantly more effective than a *verbal* (underline/circle text) tutorial for summarizing paragraph-length passages. Furthermore, the visual tutorial was significantly more effective than the verbal tutorial in teaching college students two of the most important features of a quality summary: (1) identifying main ideas of the source text and (2) restating the source text in one's own words and style.

The pictorial map developed by this researcher shows promise as a new visual scaffold for research. It conveniently borrows salient features from knowledge maps, concept maps, and graphic organizers, and uses basic journalism questions to organize the visual framework. The numerous hybrid components (e.g., images, partial labels, directional lines) and the way they may separately influence learning also limits this researcher in drawing further conclusions about this specific visual scaffold. However, the effect of the topic interest variable on a quality summary may be further examined through the lens of the post-treatment satisfaction survey.

Students in both the visual and verbal groups reported on the survey that the high-interest politics passage was "easier to summarize" and "more interesting" than the low-interest ballet passage. They also reported that the low-interest ballet passage was "more complex" and "uninteresting." These perceptions may have accounted for the different results between the politics and ballet summaries: in both treatment groups the politics summaries were of higher quality than the ballet summaries. One may reasonably infer therefore that interest contributed at least partially to the differences in quality. Unfortunately, more direct conclusions about the relationship between topic interest and summary quality cannot be made because certain questions were not asked in the satisfaction survey; for example, "Did your interest in the subject matter (politics or ballet) make it easier for you to summarize the passage?"

On the post-treatment summarization knowledge test students in both treatment groups significantly increased their average summarization knowledge scores. Even though the specific format of the treatments was not significant in the scoring ($M = 8.12$ for visual versus $M = 8.30$ for verbal), the overall increase in summarization knowledge indicated that students benefited from both treatments. In addition, 70% of the students in this study reported they had no prior formal summarization instruction, yet 85% of the students gave extremely positive comments on the value of the tutorials (see Appendix K). Although the lack of prior training was not surprising, the positive student ratings and empirical results should be encouraging to educators and researchers alike that a well designed 1-½-hour tutorial may dramatically improve summarization skills.

Implications for Research

Future researchers are encouraged to study the effects of visual scaffolds in summary writing. The first critical stage of this complex cognitive process (i.e., summarizing) requires the comprehension of main ideas and propositions in a source passage. Previous studies have examined how visual adjuncts, particularly knowledge maps, enhance the cognitive links between reading comprehension and capturing main ideas (e.g., Hall, Hall, & Saling, 1999; Chang, Sung, & Chen, 2002). This experiment should provide added empirical evidence to support more studies that test the effects of pictorial maps on comprehension.

Since the pictorial map is a hybrid graphic strategy with many distinct features, each component requires scrutiny. Researchers should continue to look at the effects of concrete versus abstract images, and detailed versus relational images for depicting the idea units in a source text (e.g., David, 1998). The effects of partially complete labels compared to fully complete labels and directional links scaffolds should be further explored (e.g., Yin, Vanides, Ruiz-Primo, and Ayala, 2005). In addition, the journalism questions in the pictorial map could be tested in various forms, such as comparing the formats of partially blank questions that must be filled in, to formats with only four or five questions rather than six, to formats with only questions and no images.

Future researchers should be encouraged to study pictorial maps with different types of source passages (i.e., narrative, expository, descriptive) and their effects on the quality of summaries. What are the effects of using different passage lengths (e.g., paragraph versus page-length text)? How does paragraph complexity (e.g., explicit topic sentence paragraph versus tacit meaning paragraph) affect quality? What are the effects

of counter-balancing the order of source passages (e.g., low-interest content followed by high-interest content versus high-interest content followed by low-interest content)? How do different levels of topic interest and prior knowledge affect quality summaries?

Research has shown that reading skills, topic interest, and prior knowledge are aptitudes affecting comprehension and summarizing ability (e.g., Alexander, Kulikowich, & Schulze, 1994; Schiefele & Krapp, 1996). High-skill readers, for example, process information differently than low-skill readers: high-skill readers focus more on relational knowledge while low-skill readers focus more on details when summarizing text (Waddill and McDaniel, 1992, 1993). Studies could be conducted on the interaction between students with different reading-levels or ESL students and various pictorial maps comprised of detailed or relational idea units and examining the effects on summary quality.

The popular Flesch-Kinkaid Reading Ease and Grade Level scores were used to analyze the complexity and readability of the two source passages. Both source passages were roughly equivalent in both reading ease ("difficult-very difficult") and grade levels (14.2 and 14.4). Flesch-Kinkaid is a single-dimension metric based on the length of words and sentences, and it is an easy metric to compute (Flesch, 1948). However, future researchers are encouraged to use more powerful text analysis tools, such as the Coh-Metrix for computing multiple text characteristics and levels of language-discourse and therefore ensuring more equivalency in the difficulty of the source passages and more accuracy in interpreting the summary quality (Graesser, McNamara, & Kulikowich, 2011). The goal in exploring new tools to analyze text should be to develop the most efficient instruction to support reading comprehension and summary writing skills.

Implications for Practice

Summary writing is a valuable skill at every grade level across the college curriculum. It provides instructors with a quick evaluation of how well students understand main ideas and proportional relationships to other concepts. It improves reading comprehension, critical thinking, and the ability to synthesize information and reduce accidental plagiarism in research writing. Unfortunately, studies have shown that instructors in upper division courses cannot assume that summary writing ability will improve as students advance through college. Roig (1997), for instance, found that the paraphrasing ability of freshman was significantly better than sophomores, and juniors paraphrased better than seniors. Therefore, instructors and students, especially in subjects requiring large amounts of reading, may see a standalone summary tutorial as a convenient and efficient tool to help them meet some course and learning objectives. Upper division instructors who have time and resources available could develop a library of source passages and representative public-domain images for customized instruction. If instructors want to introduce students to key theories or more difficult material in a course, they could substitute new passages from textbooks or supplemental readings. If a 1-1/2-hour tutorial is too long for a normal class period, students could complete a self-paced instructional booklet at home.

However, the creation of pictorial map tutorials with carefully chosen photos and other detailed graphic features may easily exceed the technical skills and time available for many college instructors. Therefore, how to maintain or enhance summary writing skills based on a pictorial map tutorial may quickly become a problem. Three, six, or nine months after the initial pictorial map training and without a step-by-step booklet,

will students continue to ask journalism questions, visualize images for main ideas, and see linking lines for propositional constructs when they have to summarize sources for research? Or will the processes learned originally in a structured format be forgotten or ignored under more practical conditions? Answers to these questions are outside the scope of this study, and instructors who see value in maintaining students' summary writing skills will be challenged to develop creative strategies until research provides some practical, time-saving techniques.

With the popularity of online and blended courses however, an ideal solution for integrating summary writing instruction into all levels of the college curriculum could be for the information technology staff to collaborate with subject-matter experts and implement web-based tutorials accessible to students and instructors at any time.

Final Summary

Inadvertent plagiarism is a widespread problem among college students. A root cause is the misunderstanding of rules and expectations about how source passages should be properly restated. Summarizing and paraphrasing instruction is one way to address this problem. However, text-based tools that rely on underlining and circling main ideas in a passage may only be partially effective in encouraging students to use their own language and writing style when restating text.

The purpose of this study was to explore whether a visual strategy (pictorial map) was more effective in teaching students to summarize than a customary text-based strategy (underline/circle text). Dual coding and cognitive load theories provided a strong theoretical rationale for the benefits of graphically scaffolded instruction.

Scaffolds enhance mental imagery and free up cognitive resources to restate text in one's own wording and writing style. K-12 materials use visual scaffolds to teach summarizing, but college instruction does not, even though older students continue to have problems understanding passages with implicitly stated ideas. Furthermore, this study introduced topic interest as a scaffold to actively engage students with the source text.

The findings revealed that both text-based and pictorial map tutorials improved students' summary knowledge skills. However, the visual strategy (pictorial map) helped students write significantly better summaries than the verbal strategy (underline/circle main ideas). The pictorial map also was a better adjunct for capturing main ideas and writing a summary in one's own words and style. High-interest content, on the other hand, did not produce significant improvements in the quality of summary writing. Overall, this experiment demonstrated that a pictorial map was a viable and practical learning adjunct. It also generated sufficient empirical data to warrant more research on the uses of pictorial maps in summary writing. Furthermore, the treatment tutorial can be easily modified by instructors who want to improve their students' summary writing skills using subject matter in courses taught throughout the curriculum.

REFERENCES

Alexander, P.A. (1998). The nature of disciplinary and domain learning: The knowledge, interest, and strategic dimensions of learning from subject-matter text. In C. Hynd (Ed.), *Learning from text across conceptual domains* (pp. 263-287). Mahwah, NJ: Erlbaum.

Alexander, P.A., & Jetton, T.L. (1996). The role of importance and interest in the processing of text. *Educational Psychology Review, 8,* 89-121.

Alexander, P.A., Schallert, D.L., & Hare, V.C. (1991). Coming to terms: How researchers in learning and literacy talk about knowledge. *Review of Educational Research, 61,* 315-343.

Alvermann, D.E. (1981). The compensatory effect of graphic organizers on descriptive text. *The Journal of Educational Research, 75*(1), 44-48.

Alvermann, D.E. (1986). Graphic organizers: Cueing devices for comprehending and remembering main ideas. In J.F. Baumann (Ed.) *Teaching main idea comprehension* (pp. 210-226). Newark, DE: International Reading Association.

American Psychological Association. (2010). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC.

Anderson, J. R. (1990). *Cognitive psychology.* New York: Freeman.

Anderson, J.R. (1993). Rules of the mind. Hillsdale, New Jersey: Erlbaum.

Anderson, V., & Hidi, S. (1988). Teaching students to summarize. *Educational Leadership (46)*4, 26-28.

Atkinson, R.K., & Renkl, A. (2007). Interactive example-based learning environments: Using interactive elements to encourage effective processing of worked examples. *Educational Psychology Review, 19.* DOI 10.1007/s10648-007-9055-2.

Ausubel, D.P. (1968). *Educational psychology: A cognitive view.* New York: Holt.

Baddeley, A.D. (1986). *Working memory.* New York: Oxford University Press.

Barron, R.F., & Schwartz, R.M. (1984). Graphic postorganizers: A spatial learning strategy. In C.D. Holley, & D.F. Dansereau (Eds.), *Spatial learning strategies* (pp. 275-289). Orlando, FL: Academic Press.

Barry, E.S. (2006). Can paraphrasing practice help students define plagiarism? *College Student Journal, 20*, 377-384.

Basil, M.D. (1994). Multiple resource theory: Application to television viewing. *Communication Research, 21*, 177-207.

Bean, T.W., & Steenwyk, F.L. (1984). The effect of three forms of summarization instruction on sixth-graders' summary writing and comprehension. *Journal of Reading Behavior, 16*, 287-306.

Beck, I.L, McKeown, M.G., & Worthy, J. (1995). Giving text voice can improve students' understanding. *Reading Research Quarterly, 30*, 220-238.

Berkowitz, S.J. (1986). Effects of instruction in text organization on sixth-grade students' memory for expository reading. *Reading Research Quarterly, 21*, 161-178.

Bernard, R.M. (1990). Using extended captions to improve learning from instructional illustrations. *British Journal of Educational Technology, 21*, 215-225.

Biggs, J. (2001). Enhancing learning: A matter of style or approach? In R.J. Sternberg & L Zhang (Eds.). *Perspectives on thinking, learning, and cognitive styles* (pp. 73-102). Mahwah, NJ: Erlbaum.

Boscolo, P., & Mason, L. (2003). Topic knowledge, text coherence, and interest: How they interact in learning from instructional texts. *The Journal of Experimental Education, 71*(2), 126-148.

Bransford, J.D. (1979). *Human cognition: Learning, understanding, and remembering.* Belmont, CA: Wadsworth.

Bransford, J.D., Brown, A.L., & Cocking, R.R. (2000). *How people learn: Brain, mind, experience, and school*. Washington, D.C.: National Academy Press.

Brosius, H. B., Donsbach, W., & Birk, M. (1996). How do text-pictures relations affect the informational effectiveness of television newscasts? *Journal of Broadcasting & Electronic Media, 40*, 180-195.

Brown, A. L., & Day, J.D. (1983). Macro-rules for summarizing texts: The development of expertise. *Journal of Verbal Learning and Verbal Behavior, 22*, 1-14.

Brown, A. L., Day, J.D., & Jones, R.S. (1983). The development of plans for summarizing texts. *Child Development, 54*, 968-979.

Brown, A.L., Bransford, J.D., Ferrara, R.A., & Campione, J.C. (1983). Learning, remembering, and understanding. In J. Flavell & E.M. Markman (Eds.),

Handbook of child psychology: Vol. 3, Cognitive development (4th ed., pp. 515-629). New York: Wiley.

Camperell, K., & Reeves, C. (1982, October). *Effects of training junior college students to use networking techniques to understand and study technical tests.* Presentation, 26th Annual Meeting of the College Reading Association, Philadelphia, PA.

Carney, R. N., & Levin, J.R. (2002). Pictorial illustrations still improve students' learning from text. *Educational Psychology Review, 14*(1), 5-26.

Casazza, M.E. (1992). Teaching summary writing to enhance comprehension. *Reading Today, 9,* 28.

Chandler, P., & Sweller. J. (1991). Cognitive load theory and the format of instruction. *Cognition and Instruction, 8,* 293-332.

Chang, K.E., Chiao, B.C., Hsiao, R.S., & Chen, S.W. (2000). A programming learning system for beginners—A completion stategy approach. *IEEE Transaction on Education, 43,* 211-220.

Chang, K.E., Sung, Y.T., & Chen, I. D. (2002). The effect of concept mapping to enhance text comprehension and summarization. *The Journal of Experimental Education. 71*(1), 5-23.

Chmielewski, T.L., & Dansereau, D.F. (1998). Enhancing the recall of text: Knowledge mapping training promotes implicit transfer. *Journal of Educational Psychology, 90*(3), 407-413.

Clark, J.M., & Paivio, A. (1991). Dual coding theory and education. *Educational Psychology Review, 3,* 149-210.

Clarke, I., Flherty, T., & Yankey, M. (2006). Teaching the visual learner: The use of visual summaries in marketing education. *Journal of Marketing Education, 28,* 218-226. DOI: 10.1177/0273475306291466.

Clines, R.H., & Cobb, E.R. (2006). *Research writing simplified: A documentation guide*. Boston, MA: Pearson Education.

Cole, J., Muenz, T., Ouchi, B., Kaufman, N., & Kaufman, A. (1997). The impact of pictorial stimulus on written expression output of adolescents and adults. *Psychology in the Schools, 34*(1), 1-9.

Cordova, D.I., & Lepper, M.R. (1996). Intrinsic motivation and the process of learning: Beneficial effects of contextualization, personalization, and choice. *Journal of Educational Psychology, 88,* 715-730.

Cowan, N. (2001). The magical number 4 in short-term memory: A reconsideration of mental storage capacity. *Behavioral and Brain Sciences, 24*, 87-114.

Cronbach, L.J. (Eds.). (2002). *Remaking the concept of aptitude: Extending the legacy of Richard E. Snow.* Mahwah, NJ: Erlbaum.

Cronbach, L.J. & Snow, R.E. (1977). *Aptitudes and instructional methods: A handbook for research and interactions.* New York: Irvington.

Daneman, M., & Ellis, M. (1995). Memory for expository text: The effects of verbal and pictorial enhancement. *Educational Psychology, 15*(2), 115-126.

Dansereau, D.F. (1989, March). *Knowledge maps: An analysis of spatial/verbal processing.* Presentation, American Educational Research Association, San Francisco, CA.

David, P. (1998). News concreteness and visual-verbal association: Do news pictures narrow the recall gap between concrete and abstract news? *Human Communication Research, 25*(2), 163-299.

Day, J.D. (1980). *Training summarization skill: A comparison of teaching methods.* Unpublished doctoral dissertation, University of Illinois.

Day, J.D., & Cordon, L.A. (1993). Static and Dynamic Measures of Ability: An Experimental Comparison. *Journal of Educational Psychology, 85*(1), 75-82.

Dean, R.S., & Kulhavy, R.W. (1981). The influence of spatial organization in prose learning. *Journal of Educational Psychology, 73*(1), 57-64.

Dewey, J. (1946), Peirce's Theory of Linguistic Signs, Thought, and Meaning. *The Journal of Philosophy, 43*(4), 85-95.

DiCecco, V.M., & Gleason, M.M. (2002). Using graphic organizers to attain relational knowledge from expository text. *Journal of Learning Disabilities, 35*, 306-320.

Dole, J.A., Duffy, G.G., Roehler, L.R., & Pearson, P.D. (1991). Moving from the old to the new: Research o reading comprehension instruction. *Review of Educational Research, 61,* 239-264.

Dunston, P.J. (1992). A critique of graphic organizer research. *Reading Research & Instruction, 31,* 57-65.

Enchanted Learning. *Star structure of the graphic organizer.* Retrieved March 8, 2010, from http://www.enchantedlearning.com/graphicorganizers/.

Enchanted Learning. *Star structure of the graphic organizer with 5 W's & 1 H.* Retrieved March 8, 2010, from http://www.enchantedlearning.com/graphicorganizers /5ws/circles5.shtml.

Ercegovac, Z., & Richardson, J. (2004). Academic dishonesty, plagiarism included, in the digital age: A literature review. *College & Research Libraries, 7,* 301-318.

Felder, R.M, & Silverman, L.K. (1988). Learning and teaching styles in engineering education. *Engineering Education, 78*(7), 674-681.

Felder, R.M., & Spurlin, J. (2005). Applications, reliability and validity of the indexof learning styles. *International Journal of Engineering Education, 21*(1), 103-112.

Feldman, S., Anderson, V., & Mangurian, L. (2001). Teaching effective scientific writing: Refining students' writing skills within the Towson Transition Course. *Journal of College Science Teaching, 30,* 446-449.

Fish, S. (2011). *How to Write a Sentence: And How to Read One*. New York: Harper Collins.

Friend, R. (1987). *Teaching summarization as a study technique.* Paper presented at the meeting of the Professional Organization of the Higher Education Opportunity Program, Syracuse, NY.

Gajadhar, J. (1998). Issues in plagiarism for the new millennium: An assessment odyssey. Retrieved April 30, 2010, from ultiBase Articles at http://ultibase.rmit.edu.au/ Articles/dec98/gajad1.htm

Garcia, M.R., & Stark, P. (1991). *Eyes on the news.* St. Petersburg, FL: Poynter Institute.

Garner, R. (1985). Text summarization deficiencies among older students: Awareness or production ability? *American Educational Research Journal, 22*, 549-560.

Garner, R., & Gillingham, M.G. (1991). Topic knowledge, cognitive interest, and text recall: A microanalysis. *Journal of Experimental Education, 59*, 310-319.

Garner, R., Gillingham, M.G., & White, C.S. (1989). Effects of "seductive details" on macroprocessing and microprocessing in adults and children. *Cognition Instruction, 6*, 41-57.

Garner, R., & McCaleb, J.L. (1985). Effects of text manipulations on quality of written summaries. *Contemporary Educational Psychology, 10*, 139-149.

Gerjets, P., & Scheiter, K. (2003). Goal configurations and processing strategies as moderators between instructional design and cognitive load: Evidence from hypertext-based instruction. *Educational Psychologist, 38,* 33-41.

Goetz, E.T., & Sadoski, M. (1995). The perils of seduction: distracting details or incomprehensible abstractions? *Reading Research Quarterly,* 500-511.

Golinkoff, R.M. (1976). A comparison of reading comprehension processes in good and poor comprehenders. *Reading Research Quarterly, 11,* 623-659.

Graesser, A.C., & McNamara, D.S. (2011). Coh-Metrix: Providing Multilevel Analyses of Text Characteristics. *Educational Researcher,* June/July, 223-247.

Griffin, C.C., & Tulbert, B.L. (1995). The effect of graphic organizers on students' comprehension and recall of expository text: A review of the research and implications for practice. *Reading & Writing Quarterly, 11,* 73-89.

Griffin, C.C., Malone, L. D., & Kameenui, E. J. (1995). Effects of Graphic Organizer Instruction on Fifth-Grade Students. *The Journal of Educational Research, 89*(2), 98-107.

Grigorenko, E.L., & Sternberg, R.J. (1997). Thinking styles, abilities, and academic performance. *Exceptional Children, 63,* 295-312.

Grimes, T. (1991). Mild auditory-visual dissonance in television news may exceed viewer attentional capacity. *Human Communication Research, 18,* 268-298.

Guri-Rosenblit, S. (1989). Effects of a tree diagram on students' comprehension of main ideas in an expository text with multiple themes. *Reading Research Quarterly, 24,* 236-247.

Hacker, D., & Sommers, N. (2011). *A Writer's Reference.* Bedford/St. Martin's: New York.

Hall, R. H., Dansereau, D. F., & Skaggs, L. P. (1992). Knowledge-maps and the presentation of related information domains. *The Journal of Experimental Education, 61,* 5-18.

Hall, R. H., & O'Donnell, A. M. (1996). Cognitive and affective outcomes of learning from knowledge-maps. *Contemporary Educational Psychology, 21,* 291-302.

Hall, R. H., & Sidio-Hall, M. A. (1994). The effect of color enhancement on knowledge-map processing. *The Journal of Experimental Education, 62,* 209-217.

Hall, R.H., Hall, M.A., & Saling, C.B. (1999). The effects of graphical postorganization strategies on learning from knowledge maps. *The Journal of Experimental Education, 67*(2), 101-112.

Hare, V., & Borchardt, K. (1984). Direct instruction of summarization skills. *Reading Research Quarterly, 21,* 62-78.

Harris, R.A. (2002). The plagiarism handbook: Strategies for preventing, detecting, and dealing with plagiarism. *Adolescence, 37*(147), 647.

Hartley, J. (1998). *Learning and studying: A research perspective*. London: Routledge.

Hibbing, A.N. & Rankin-Erickson, J.R. (2003). A picture is worth a thousand words: Using visual images to improve comprehension for middle school struggling readers. *The Reading Teacher*, *56*(8), 758-770.

Hidi, S., & Anderson, V. (1987). Producing written summaries: Task commands, cognitive operations, and implications for instruction. *Review of Educational Research, 56,* 473-493.

Hidi, S. & Baird, W. H. (1986). Interestingness—A neglected variable in discourse processing. *Cognitive Science, 10,* 179-194.

Hidi, S., & Baird, W.H. (1988). Strategies for increasing text-based interest and students' recall of expository texts. *Reading Research Quarterly, 23,* 465-483.

Hidi, S., & Renninger, K.A. (2006). The four-phase model of interest development. *Educational Psychologist, 41*(2), 111-127.

Hill, M. (1991). Writing summaries promotes thinking and learning across the curriculum—But why are they so difficult to write? *Journal of Reading, 34,* 536-539.

Holley, C.D., & Dansereau, D.F. (1980/1981, Winter). Controlling for transient motivation in cognitive manipulation studies. *Journal of Experimental Education, 49,* 84-91.

Holmes, B.C. (1987). Children's inferences with print and pictures. *Journal of Educational Psychology*, *79*(1), 14-18.

Hmelo-Silver, C.E. (2006). Design principles for scaffolding technology-based inquiry. In A.M. O"Donnell, C.E. Hmelo-Silver, & G. Erkens (Eds.), *Collaborative reasoning, learning and technology* (pp. 147-170). Mahwah, NJ: Erlbaum.

Jackson, P. (2006). Plagiarism instruction online: Assessing undergraduate students' ability to avoid plagiarism. *College & Research Libraries, 67*(5), 418-428.

Johnson, N. (1983). What do you do if you can't tell the whole story? The development of summarization skills. In *Children's Language*, Vol. 4, edited by K.E. Nelson. Hillside, N.J.: Erlbaum.

Kalyuga, S. (2005). Prior knowledge principle. In R. Mayer (Ed.), *Cambridge handbook of multimedia learning* (pp. 325-337). New York: Cambridge University Press.

Kalyuga, S. (2006). *Instructing and testing advance learners: A cognitive load approach.* New York: Nova Sciences.

Kalyuga, S. (2007). Enhancing instructional efficiency of interactive e-learning environments: A cognitive load perspective. *Educational Psychology Review, 19,* 387-399.

Kalyuga, S., Ayres, P., Chandler, P., & Sweller, J. (2003). The Expertise Reversal Effect. *Educational Psychologist, 28*(1), 23-31.

Kao, M.T., & Lehman, J.D. (1997). *Scaffolding in a computer-based constructivist environment for teaching statistics to college students.* Paper presented at the annual meeting of the American Educational Research Association, Chicago.

Katayama, A.D., & Robinson, D.R. (2000). Getting students "partially" involved in note-taking using graphic organizers. *Journal of Experimental Education, 68,* 119-133.

Kinchin, I.M. (2000). Using concept maps to reveal understanding: A two-tier analysis. *School Science Review, 81,* 41-46.

Kim, A., Vaughn, S., Wanzek, J., & Wei, S. (2004). Graphic organizers and their effects on reading comprehension of students with LD: A synthesis of research. *Journal of Learning Disabilities, 37,* 105-118.

Kintsch, E., & Kintsch, W. (1997). Learning from text. In E.D. DeCorte & F.E. Weinert (Eds.). *International encyclopedia of developmental and instructional psychology* (pp. 519-524). Amsterdam: Elsevier.

Kintsch, E., Steinhart, D., Stahl, G., LSA Research Group. Matthews, C., & Lamb, R. (2000). Developing summarization skills through the use of LSA-based feedback. *Interactive Learning Environments, 8,* 87-109.

Kintsch, W. (1980). Learning from text, levels of comprehension, or: Why anyone would read a story anyway. *Poetics, 9,* 87-89.

Kintsch, W. (1998). Comprehension: A paradigm for cognition. New York: Cambridge University Press.

Klausman, J. (1999). Teaching about plagiarism in the age of the internet. *Teaching English in the Two-Year College,* 27, 209-212.

Kools, M., van de Wiel, M., Ruiter, R., Crüts, A., Kok, G. (2006). *Health Education & Behavior, 33*(6), 760-772.

Krapp, A. (2002). Structural and dynamic aspects of interest development: Theoretical considerations from an ontogenetic perspective. *Learning and Instruction, 12,* 383-409.

Lampert, L.D. (2004). Integrating discipline-based anti-plagiarism instruction into the information literacy curriculum. *Reference Services Review, 32*(4), 347-355.

Landau, J.D., Druen, P.B., & Arcuri, J.A. (2002). Methods for helping students avoid plagiarism. *Teaching of Psychology, 29,* 112-115.

Lasarenko, J. (1996). Teaching paraphrase, summary, and plagiarism: An integrated approach. *Exercise Exchange,* 41, 10-12.

Lathrop, A. & Foss, K. (2000). Student cheating and plagiarism in the internet era. A wake-up call. Englewood, Colorado: Libraries Unlimited.

Leeds-Hurwitz, W. (1993). *Semiotics and communication: Signs, codes, cultures.* Hillsdale, NJ: Lawrence Erlbaum.

Levie, W.H., (1987). Research on pictures: A guide to the literature. In D.M. Willows & H.A. Houghton (Eds.), *The psychology of illustration: Vol. 1. Basic research* (pp. 1-50). New York: Springer-Verlag.

Levie, W.H., & Lentz, R. (1982). Effects of text illustrations: A review of research. *Educational Communication and Technology Journal, 30,* 195-232.

Levin, J.R. (1973). Inducing comprehension in poor readers: A test of a recent model. *Journal of Educational Psychology, 65,* 19-24

Levin, J.R. (1981). On functions of pictures in prose. In F.J. Pirozzolo & M.C. Witrock (Eds.), *Neuropsychologicial and cognitive processes in reading* (pp. 203-228). New York: Academic Press.

Levin, J.R. (1983). Pictorial strategies for school learning: Practical illustrations. In Pressley, M., and Levin, J.R. (eds.), Cognitive Strategy Research: Educational Applications, Springer, New York, pp. 213-237.

Levin, J.R., Anglin, G.J., & Carney, R.N. (1987). On empirically validating functions of pictures in prose. In D.M. Willows & H.A. Houghton (Eds.), *The psychology of illustration: Vol. 1. Basic research* (pp. 51-85). New York: Springer-Verlag.

Levin, J.R., Divine-Hawkins, P., Kerst, S.M., & Guttmann, J. (1974). Individual differences in learning from pictures and words: The development and application of an instrument. *Journal of Educational Psychology, 66,* 296-303.

Levin, J.R., & Mayer, R.E. (1993). Understanding illustrations in text. In Britton, B.K., Woodward, A., & Brinkley, M. (Eds.), *Learning from textbooks*, (pp. 95-113). Hillsdale, NJ: Erlbaum.

Litzinger, T.A., Lee, S.H., Wise, J.C., & Felder, R.M. (2005). A study of the reliability and validity of the felder-soloman index of learning styles. *Proc. 2005 Annual ASEE Conference*, Washington, DC.

Livesay, G.A., Dee, K.C., Nauman, E.A., & Hites, L.S. (2002). *Engineering student learning styles: A statistical analysis using Felder's Index of Learning Styles*, presented at 2002 Annual Conference of the American Society for Engineering Education, Montreal, Quebec.

Mannes, S.M., & Kintsch, W. (1987). Knowledge organization and text organization. *Cognition and Instruction, 4*, 91-115.

May, C., Campbell, S., & Doyle, H. (2000). Research misconduct: A pilot study of British addiction researchers. *Addiction Research, 6*(4), 371-373.

Mayer, R.E. (1979). Can advance organizers influence meaningful learning? *Review of Educational Research, 49*, 371-383.

Mayer, R.E. (2001). *Multimedia learning.* New York: Cambridge University Press.

Mayer, R.E. (2005). Principles for managing essential processing in multimedia learning: Segmenting, pretraining, and modality principles. In R.E. Mayer (Ed.), *The Cambridge handbook of multimedia learning* (pp. 169-182). New York: Cambridge University Press.

Mayer, R.E., & Gallini, J.K. (1990). When is an illustration worth ten thousand words? *Journal of Educational Psychology, 82*, 715-726.

Marsh, R.I., Landau, J.D., & Hicks, J.L. (1997). Contributions of inadequate source monitoring to unconscious plagiarism during idea generation. *Journal of Experimental Psychology, 23*, 889-897.

McCabe, D.L. (2001). Cheating. *American Educator (Winter),* Retrieved on September 6, 2009.

McCagg, E.C., & Dansereau, D.F. (1991). A convergent paradigm for examining knowledge mapping as learning and recall strategy. *Journal of Educational Research, 84*, 317-324.

Mintzes, J.J., Wandersee, J.H., & Novak, J.D. (1997). *Teaching science for understanding*. San Diego, CA: Academic Press.

Mitchell, M. (1993). Situational Interest: Its multifaceted structure in the secondary school mathematics classroom. *Journal of Educational Psychology, 85*(3), 424-436.

Moore, D.W., & Readence, J.E. (1980). A meta-analysis of the effect of graphic organizers on learning from text. In M.L. Kamil, & A.J. Moe (Eds.), *Perspectives in reading research and instruction* (pp. 213-217). Twenty-ninth Yearbook of the National Reading Conference.

Moore, D. W., & Readence, J. E. (1984). A quantitative and qualitative review of graphic organizer research. *Journal of Educational Research, 78*(1), 11-17.

Mousavi, S.Y., Low, R., & Sweller, J. (1995). Reducing cognitive load by mixing auditory and visual presentation modes. *Journal of Educational Psychology, 87*, 319-334.

Nelson, D.L., Ree, V.S., & McEvoy, C.L. (1977). Learning to order pictures and words: A model of sensory and semantic encoding. *Journal of Experimental Psychology: Human Learning and Memory, 3*, 485-497.

Novak, J.D., & Gowin, D.B. (1984). *Learning how to learn.* New York: Cambridge University Press.

Novak, J.D., & Musonda, D. (1991). A twelve-year longitudinal study of science concept learning. *American Educational Research Journal, 28*, 117-153.

O'Donnell, A. M., Dansereau, D.F., & Hall, R.H. (2002). Knowledge maps as scaffolds for cognitive processing. *Educational Psychology Review, 14*(1), 71-86.

Ollerenshaw, A., Aidman, E., & Kidd, G. (1997). Is an illustration always worth ten thousand words? Effects of prior knowledge, learning style, and multimedia illustrations on text comprehension. *International Journal of Instructional Media, 24*, 227-238.

Paas, F., Renkl, A., & Sweller, J. (2003). Cognitive load theory and instructional design: Recent developments. *Educational Psychologist, 38*(1), 1-4.

Paivio, A. (1971). *Imagery and verbal processes.* New York: Holt, Rinehart & Winston.

Paivio, A. (1983). The empirical case for dual coding theory. In J.C. Yuille (Ed.), *Imagery, memory, and cognition: Essay in honor of Allan Paivio* (pp. 307-332). Hillsdale, NJ: Erlbaum.

Paivio, A. (1986). *Mental representation: A dual coding approach.* New York: Oxford University Press.

Paivio, A. (1991). Dual coding theory: Retrospect and current status. *Canadian Journal of Psychology, 45*, 255-287.

Paivio, A., Yuille, J.C., & Madigan, S.A. (1968). Concreteness, imagery, and meaningfulness values for 925 nouns. *Journal of Experimental Psychology Monograph Supplement, 76*(1), 1-25.

Paris, S.G., Wasik, B.A., & Turner, J.C. (1991). The development of strategic readers. In R. Barr, M.L., Kamil, P.B., Mosenthal, & P.D. Pearson (Eds.). *Handbook of reading research* (Vol. 2, pp. 609-640). New York: Longman.

Peeck, J. (1993). Increasing picture effects in learning from illustrated text. *Learn. Instruct, 3*, 227-238.

Perkins, D. & Salomon, G. (1992). Transfer of learning. *Contribution to the International Encyclopedia of Education* (2nd ed.). Oxford, England: Pergamon Press.

Pressley, M., & Woloshyn, V. (1995). *Cognitive strategy instruction that really improves children's academic performance* (2nd ed.). Cambridge MA: Brookline Books.

Rayner, S., & Riding, R. (1997). Towards a categorization of cognitive styles and learning styles. *Educational Psychology, 17*(1-2), 5-27.

Reader, W., & Hammond, N. (1994). Computer-based tools to support learning from hypertext: Concept mapping tools and beyond. *Computers and Education, 12*, 99-106.

Reese, S. D. (1984). Visual -- verbal redundancy effects on TV news learning. *Journal of Broadcasting, 28*, 79-87.

Reinking, D.R., Hayes, D.A., & McEneaney, J.E. (1988). Good and poor readers' use of explicitly cued graphic aids. *Journal of Reading Behavior, 20*, 229-243.

Renkl, A., & Atkinson, R. (2003). Structuring the transition from example study to problem solving in cognitive skill acquisition: A cognitive load perspective. *Educational Psychologist 38*(1), 15-22.

Renninger, K.A., Hidi, S., & Krapp, A. (1992). *The role of interest in learning and development.* Hillsdale, NJ: Erlbaum.

Rewey, K.L., Dansereau, D.F., Peel, J.L. (1991). Knowledge maps and information processing strategies. *Contemporary Educational Psychology, 16,* 203-214.

Rewey, K. L., Dansereau, D. F., Skaggs, L. P., Hall, R. H., & Pitre, U. (1989). Effects of scripted cooperation and knowledge-maps on the recall of technical material. *Journal of Educational Psychology, 81,* 604-609.

Rice, G.E. (1994). Ned for explanations in graphic organizer research. *Reading Psychology: An International Quarterly, 15,* 39-67.

Riding, R.J., & Douglas, G. (1993). The effect of cognitive style and mode of presentation on learning performance. *British Journal of Educational Psychology, 63,* 297-307.

Rinehart, S.D., Stahl, S.A., & Erickson, L.G. (1986). Some effects of summarization training on reading and studying. *Reading Research Quarterly, 21,* 422-437.

Roig, M. (1997). Can undergraduate students determine whether text has been plagiarized? *The Psychological Record, 47*(1), 113-122.

Roig, M. (1999). When college students' attempts at paraphrasing become instances of potential plagiarism. *Psychology Reports, 84,* 973-982.

Roig, M. (2001). Plagiarism and paraphrasing criteria of college and university professors. *Ethics & Behavior, 11*(3), 307-323.

Rosenshine, B., & Meister, C. (1992). The Use of Scaffolds for Teaching Higher-Level Cognitive Strategies. *Educational Leadership,* 49(7), 26-33.

Ross, S.M., & DiVesta, F.J. (1976). Oral summary as review strategy for enhancing recall of textural material. *Journal of Educational Psychology, 68,* 689-695.

Royer, J.M., & Cable, G.W. (1976). Illustrations, analogies, and facilitative transfer in prose learning. *Journal of Educational Psychology*, 68, 205-209.

Rubman, C.N., & Waters, H.S. (2000). A, B seeing: The role of reconstructive processes in children's comprehension monitoring. *Journal of Educational Psychology, 92,* 503-514.

Sadoski, M. (2005). A dual coding view of vocabulary learning. *Reading & Writing Quarterly, 21,* 221-238.

Sadoski, M., Paivio, A., & Goetz, E.T. (1991). A critique of schema theory in reading and a dual coding alternative. *Reading Research Quarterly, 26,* 463-484.

Schab, F. (1991). Schooling without learning: Thirty years of cheating in high school. *Adolescence, 26*(104), 839-847.

Scheiter, K., & Gerjets, P. (2007). Learner control in hypermedia environments. *Educational Psychology Review, 19*. DOI 10.1007/x10648-007-9046-3.

Schiefele, U. (1999). Interest and learning from text. *Scientific Studies of Reading, 3,* 257-280.

Schnotz, W. (2002). Towards an integrated view of learning from text and visual displays. *Educational Psychology Review, 14*(1), 101-120.

Schmid, R.F., & Talaro, G. (1991). Concept mapping as an instructional strategy for high school biology, *The Journal of Educational Research, 84,* 78-85.

Schraw, G. (1998). Processing and recall differences among seductive details. *Journal of Educational Psychology, 90,* 3-12.

Schraw. G, & Dennison, R.S. (1994). The effect of reader purpose on interest and recall. *Journal of Reading Behavior, 26,* 1-18.

Schraw, G., Flowerday, T., & Lehman, S. (2001). Increasing situational interest in the classroom. *Educational Psychology Review, 13,* 211-224.

Schraw, G., & Lehman, S. (2001). Situational interest: A review of the literature and directions for future research. *Educational Psychology Review, 13,* 23-52.

Schuetze, P. (2004). Evaluation of a brief homework assignment designed to reduce citation problems. *Teaching of Psychology, 31,* 257-259.

Seery, N., Gaughran, W.F., & Waldmann, T. (2003). Multi-model learning in engineering education, *Proc. 2003 Annual ASEE Conference*.

Simmons, D.C., Griffin, C.C., & Kameenui, E.J. (1988). Effects of teacher-constructed pre- and post-graphic organizer instruction on sixth-grade science students' comprehension and recall. *Journal of Educational Research, 82*(1), 15-21.

Snow, R., & Jackson, D. (1992). *Assessment of conative constructs for educational research evaluation: A catalogue.* Washington, DC: US Department of Education, Office of Educational Research and Improvement.

Soto, J.G., Anand, S., & McGee, E. (2004). Plagiarism avoidance. *Journal of College Science Teaching, 33*(7), 42-48.

Spooren, W., Mulder, M., & Hocken, H. (1998). The role of interest and text structure in professional reading. *Journal of Research Reading, 21,* 109-120.

Sternberg, R.J. (1997). *Thinking Styles.* Cambridge, Cambridge University Press.

Stubbings, R. & Brine, A. (2003). Plagiarism and the role of the library. *Library and Information Update, 2*(12), 42-44.

Suzuki, N.S. (1985). Imagery research with children: Implications for education. In A.A. Sheikh & K.S. Sheikh (Eds.), *Imagery in Education* (pp. 179-198). Farmingdale, NY: Baywood.

Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*, 257-285.

Sweller, J. (1999). *Instructional design in technical areas*. Melbourne, Australia: ACER Press.

Sweller, J. (2003). Evolution of human cognitive architecture. In B. Ross (Ed.), *The psychology of learning and motivation* (vol. 43, pp. 215-266). San Diego, CA: Academic.

Sweller, J. (2004). Instructional design consequences of an analogy between evolution by natural selection and human cognitive architecture. *Instructional Science, 32,* 9-31.

Sweller, J. (2005). Implications of cognitive load theory for multimedia learning. In R.E. Mayer (Ed.), *Cambridge handbook of multimedia learning* (pp. 19-30). New York: Cambridge University Press.

Sweller, J., van Merriënboer, J.J. G., & Paas, F.G.W.C. (1998). Cognitive architecture and instructional design. *Educational Psychology Review, 10,* 251-296.

Taylor, B.M. (1982). Text structure and children's comprehension and memory for expository material. *Journal of Educational Psychology, 74,* 323-340.

Taylor, B.M. & Beach, R.W. (1984). The effect of text structure instruction on middle-grade students' comprehension and production of expository text. *Reading Research Quarterly, 19*, 132-146.

The Graphic Organizer. *Concept Map example for narrative story.* Retrieved March 8, 2010, from http://www.graphic.org/desmap.html.

Thorndyke, P.W. (1977). Cognitive structures in comprehension and memory of narrative discourse. *Cognitive Psychology, 9,* 77-110.

Tierney, R.J., & Shanahan, T. (1991). Research on the reading-writing relationship: Interactions, transactions, and outcomes. In R. Barr, M.L. Kamil, P.B. Mosenthal, & P.D. Pearson (Eds.), *Handbook on reading research* (Vol. 2, pp. 246-280). New York: Longman.

Tukey, J.W. (1990). Data-based graphics: Visual display in the decades to come. In *Proceedings of the meeting of the American Statistical Association: Sequicentennial Invited Paper Sessions* (pp. 366-381). Washington, DC: American Statistical Association.

van Dijk, T. A., & Kintsch, W. (1983). *Strategies of discourse comprehension.* New York: Academic Press.

van Merriënboer, J. (1990). Strategies for programming instruction in high school: Program completion vs. program generation. *Journal of Educational Computing Research, 6,* 265-287.

van Merriënboer, J. Kirschner, P., & Kester, L. (2003). Taking the load off a learner's mind: Instructional design for complex learning. *Educational Psychologist, 38*(1), 5-13.

van Merriënboer, J. & Sweller, J. (2005). Cognitive load theory and complex learning: Recent developments and future directions. *Educational Psychology Review, 17,* 147-177.

Waddill, P.J, & McDaniel, M.A. (1992). Pictorial enhancement of text memory: Limitations imposed by picture type and comprehension skill. *Memory & Cognition, 20*(5), 472-482.

Waddill, P.J., McDaniel, M.A., & Einstein, G.O. (1988). Illustrations as adjuncts to prose: A test-appropriate processing approach. *Journal of Educational Psychology, 80,* 457-464.

Wade, S.E., Buxton, W.M., & Kelly, M. (1999). Using think-alouds to examine reader-text interest. *Reading Research Quarterly, 34,* 194-216.

Wade-Stein, D., & Kintsch, E. (2004). Summary street: Interactive computer support for writing. *Cognition and Instruction, 22*(3), 333-362.

Walker, A. (2008). Preventing unintentional plagiarism: A method for strengthening paraphrasing skills. *Journal of Instructional Psychology, 35*(4), 387-395.

Weidenmann, B. (1989). When good pictures fail: An information-processing approach to the effect of illustrations. In Mandl, H., and Levin, J.R. (eds.), *Knowledge Acquisition from Text and Pictures*, Elsevier, Amsterdam, pp. 157-171.

Weigmann, D.A., Dansereau, D.F., Pitre, U., Rewy, K.L., & McCagg, E.C. (1990, April). *Individual differences in processing different spatial-verbal formats.* Presentation, Annual Meeting, American Educational Research Association, Boston, MA.

Wilhoit, S. (1994). Helping students avoid plagiarism. *College Teaching, 42,* 161-164.

Yin, Y., Ruiz-Vanides, M. A., Ayala, C.C., & Shavelson, R.J., (2005). Comparison of two concept-mapping techniques: Implications for scoring, interpretation, and use. *Journal of Research in Science Teaching, 42*(2), 166-184.

Young, M.S., & Stanton, N.A. (2002). Malleable Attentional Resources Theory: A new explanation for the effects of mental underload on performance. *Human Factors, 44*, 365-375.

Zillman, D., Knobloch, S., & Yu, H. (2001). Effects of photographs on the selective reading of news reports. *Media Psychology, 3,* 301-324.

Zwanenberg, N.V., Wilkinson, L.J., & Anderson, A. Felder and Silverman's Index of Learning Styles and Honey and Mumford's learning Styles Questionnaire: How do they compare and how do they predict? *Educational Psychology, 20*(3), 365-381.

Zywno, M.S. (2003). A contribution of validation of score meaning for felder-soloman's index of learning styles. *Proc. 2003 Annual ASEEE Conference,* Washington, DC.

APPENDIXES

APPENDIX A

Summarizing and Paraphrasing Guides/Fact Sheets, Web pages, Tutorials

CONTENTS

This listing and brief analysis of freely available summarization tutorials and guides was compiled by this researcher as a result of numerous Google searches using key words such as summary treatments, summary tutorials, free online guides for summary writing, free online guides for paraphrasing, summarizing, paraphrasing, plagiarism guides, plagiarism tutorials. The purpose of this list is to highlight key instructional and format characteristics that are relevant to my dissertation. Copies of the full documents are not included.

1. BOOKLET (PLAGIARISM, SUMMARY, PARAPHRASE)

Clines, R.H., & Cobb, E.R. (2006). *Research Writing Simplified* (5th ed.). Pearson Education, Inc. http://www.ablongman.com

Description: 79 pages, based on APA, 5th edition
Defines a Good Summary (p. 28):

1. It accurately reflects the meaning and intention of the original without distorting or slanting the information.

2. It is completely reworded to reflect your own vocabulary and writing style.

2. GUIDE/FACT SHEET (SUMMARY)

Summarizing a Research Article. (1997-2005). Retrieved from the University of Washington Web site: http://depts.washington.edu/psywc/handouts.shtml

Description: Divided into 2 parts: (2 pp.)

1. Reading the Article: to "underline key sentences or write the key points of each paragraph in the margin." Says to "read each section several time…ask yourself these question:…" Plagiarism: "Summarize points in your own words."

2. Writing the Summary: "To write a good summary, identify what information is important and condense that information for your reader."

3. GUIDE/FACT SHEET (SUMMARY)

Summarizing. (1992-1996). Retrieved from the University of Charleston, West Virginia, Web site:

http://www.ucwv.edu/shared/content/Page_objects/current_students/crc/Summarizing.pdf

Description: Adapted from Diana Hacker's *A Writer's Reference* (Boston: St. Martin's, 1992. 217-218) and Jane E. Aaron's *The Little, Brown Essential Handbook for Writers* (Boston: Longman, 1996. 101-102).

Divided into 5 parts: 3 pp:

1. Purpose
2. What a summary should contain
3. How to summarize
    i. Point 3: "highlight or underline" …"the portions that support the author's main idea"
    ii. Point 5: "don't include examples or details"
    iii. Point 8: "to avoid plagiarism…be sure to change the thesis, sentence structure, and vocabulary."
4. Checklist
5. Rememder

4. GUIDE/FACT SHEET (ABSTRACT)

Writing report abstracts. (1995-2009). Retrieved from The Writing Lab & The OWL at Purdue and Purdue University Web site: *http://owl.english.purdue.edu/owl/resource/656/01/*

Description: 2 pp. Excerpts from the sheet: Qualities Of A Good Abstract
An effective abstract: provides logical connections between materials

Steps For Writing Effective Report Abstracts
To write an effective report abstract, follow these four steps:

1. Reread your report with the purpose of abstracting in mind. Look specifically for these main parts: purpose, methods, scope, results, conclusions, and recommendations.
2. After you have finished rereading your report, write a rough draft WITHOUT LOOKING BACK AT YOUR REPORT.

5. GUIDE/FACT SHEET (PARAPHRASE)

Paraphrase. Write it in your own words. (1995-2009). Retrieved from The Writing Lab & The OWL at Purdue and Purdue University Web site: http://owl.english.purdue.edu/owl/resource/563/02/

Description: Divided into 2 parts: 2 pp.

1. Paraphrase: Write it in your own words
    a. Subsection three: 6 steps to effective paraphrasing
        i. Reread until you understand
        ii. Set original aside and write paraphrase on note card
        iii. Check your version for accuracy

    b. DEFINITION: uses one or more well-developed paragraphs, which are unified, coherent, concise, and able to stand alone

6. GUIDE/FACT SHEET (SUMMARY AND PARAPHRASE)

Paraphrasing and summarizing. (n.d.) Retrieved from the Academic Skills Office at the University of New England Web site: http://www.une.edu.au/tlc/aso/students/factsheets/paraphrasing.pdf

Description: 2pp. factsheet
Under Summary section:

- "Writing a summary requires a thorough understanding of the content of the text and the ability to paraphrase."

- Try to identify the main idea

7. GUIDE/FACT SHEET (SUMMARY)

Writing summaries. (n.d.). Retrieved from the Worcester State College, Massachusetts, Web site: http://wwwfac.worcester.edu/owl/teacher/writing_summaries.htm

Description: (1 page) 3 Steps:
1. read quickly
2. restate thesis
3. combine sentences

8. GUIDE/FACT SHEET (SUMMARY)

Kilborn, J. (1997). *Process for writing a summary.* Retrieved from Literary Education Online (LEO), The Write Place, at the St. Cloud State University Web

site: http://leo.stcloudstate.edu/acadwrite/summary.html

Description: 2 pages - states to read and underline main points.

- ¼ the length of the original

- This handout was adapted by Judith Kilborn with the author's permission from Donna Gorrell's *The Purposeful Writer: A Rhetoric with Readings*, 2nd ed. (Boston: Allyn and Bacon, 1993) for the Write Place, St. Cloud State University. It may be copied for educational purposes only. If you copy this document, please include our copyright notice and the names of the writers; if you revise it, please add your name to the list of writers.
  Last update: 28 September 1997
  URL: http://leo.stcloudstate.edu/acadwrite/summary.html

9. WEB PAGE/GUIDE/FACT SHEET (SUMMARY)

Drucker, P. (2006). *How to Summarize*. Retrieved from Advanced Technical Writing at the University of Idaho Web site: http://www.class.uidaho.edu/adv_tech_wrt/resources/general/how_to_summarize.htm

Description: 3 pages

- States to underline important ideas and circle key terms.

10. WEB PAGE/GUIDE/FACT SHEET (SUMMARY)

How to summarize (2000-2007). Retrieved from the Mantex Company at http://www.mantex.co.uk/samples/summary.htm

Description:

- States 1/10 of the original length.
- #8. Underline or make a marginal note of the main issues. Use a highlighter if this helps.

11. GUIDE/FACT SHEET (SUMMARY)

Learn to summarize (2005). Retrieved from the Academic Center at the University of Houston-Victoria, and Summer Leibensperger Web site: http://www.uhv.edu/ac/research/write/pdf/summarize.pdf

Description: 6 pages

- ½ the length of the original
- Gives examples of effective/ineffective summaries

12. WEB PAGE/GUIDE/FACT SHEET (SUMMARY)

How to summarize (n.d.) Retrieved from the University of Pittsburgh Web site: http://www.pitt.edu/~aboudmcg/Summary.html

Description:

- 1/5 to ¼ length of original
- Look for main ideas

13. WEB TUTORIAL (PARAPHRASE)

Rine, C. (1996). *Paraphrase Craze: A lesson in expository writing*. Retrieved from Beacon Learning Center Web site at *http://www.beaconlearningcenter.com/WebLessons/ParaphraseCraze/default.htm*

Description:
Subject(s): Language Arts (Grade 6 - Grade 8). Minimal interaction with popup answers, dropdown menus to questions and examples. Tells a story about students' assignments.
Students practice paraphrasing for expository writing.

How to:

1. read carefully
2. put it down and write in your own words; "sound like me"
3. did I get the important ideas?

14. WEB PAGE/GUIDE/FACT SHEET (SUMMARY)

Summarizing and note taking. (2005). Retrieved from Focus on Effectiveness, Northwest Regional Educational Laboratory, at http://www.netc.org/focus/strategies/summ.php

Description:

- Includes research/peer reviewed references to journal studies.

Summarizing software. (2005). Retrieved from Focus on Effectiveness, Northwest Regional Educational Laboratory, at http://www.netc.org/focus/strategies/summ.php

Description:

- Uses track changes to teach deletion of unnecessary words and highlight to teach key concepts. Includes research/peer reviewed references to journal studies.

15. WEB PAGE/GUIDE/FACT SHEET (SUMMARY)

Teaching paragraph summarization strategies. (1999-2005). Retrieved from the Special Connections at University of Kansas Web site: http://www.specialconnections.ku.edu/cgi-bin/cgiwrap/specconn/main.php?cat=instruction&subsection=rc/paragraph

Description: a teachers' resource

- Identify main ideas. Under tricks, use superordinate concepts.

16. WEB PAGE/FACT SHEET/GUIDE (SUMMARY)

Summarization techniques. (n.d.). Retrieved from the West Virginia Department of Education Web site: http://wvde.state.wv.us/strategybank/summarization.html

Description:

- List additional technique links on the page.

17. WEB PAGE/GUIDE/FACT SHEET (SUMMARY)

Melton, J. (n.d.). *Learning Tip #33: Summarizing Strategies Help Students Monitor Understanding, Clarify Thinking, and Strengthen Learning.* Retrieved from the KidBibs International Web site at: http://www.kidbibs.com/learningtips/lt33.htm

Description: k-6 level

18. WEB PAGE (PLAGIARISM/PARAPHRASING)

Plagiarism: What It is and How to Recognize and Avoid It. (2004). Retrieved from the Writing Tutorial Services at the Indiana University Web site: **http://www.indiana.edu/~wts/pamphlets/plagiarism.shtml#top**

Description: Strategies for Avoiding Plagiarism

1. Put in quotations everything that comes directly from text especially when taking notes.

2. Paraphrase, but be sure you are not just rearranging or replacing a few words. Instead, read over what you want to paraphrase carefully; **cover up the text with your hand, or close the text so you can't see any of it (and so aren't tempted to use the text as a "guide"). Write out the idea in your own words without peeking.**

3. Check your paraphrase against the original text to be sure you have not accidentally used the same phrases or words, and that the information is accurate.

19. WEB PAGE/GUIDE/FACT SHEET (SUMMARY)

Summarizing. (n.d.). Retrieved from the TeacherVision, Pearson Education, Web site at:
http://www.teachervision.fen.com/skill-builder/reading-comprehension/48785.html

20. WEB PAGE/GUIDE/FACT SHEET (SUMMARY)

Summarization (2006). Retrieved from Florida Online Reading-Professional Development (FOR-PD) at the Florida Department of Education and the University of Central Florida Web site:
http://forpd.ucf.edu/strategies/stratsummarization.html

Description: This is a more cognitive approach to summarizing which is good. Web page/fact sheet/guide with example teaching aids.

21. SOFTWARE (SUMMARY)

State the essence. (n.d.). Retrieved from the Latent Semantic Analysis Web site:
http://lsa.colorado.edu/essence

Description: "State the Essence"
Feedback / submit
Rates 1 -100

22. POWERPOINT PRESENTATION (ABSTRACT)

Writing scientific abstracts presentation. (n.d.). Retrieved from The Writing Lab & The OWL at Purdue and Purdue University Web site:
http://owl.english.purdue.edu/owl/resource/706/1/

Description: Powerpoint presentation: 10 slides

- Underline key sections

23. POWERPOINT SLIDES (SUMMARY)

Mellom, J. (n.d.) *Quoting, paraphrasing, and summarizing.* Retrieved from Bound Brook School District, Bound Brook, New Jersey, Web site at

http://bbrook.k12.nj.us/boundbrook/site/default.asp

Description: 15 slides. Under the summarizing slide:

- Try to identify the main idea or argument.

24. POWERPOINT SLIDES (SUMMARY)

Trueblood, J. (2007). GIST Reading Strategy.

Description: 10 slides. Describes GIST

http://ctteams.wikispaces.com/Effective+Teaching+Strategies

- **ETS Handouts from Jane Cook's ETS 4 Session Workshop Series at Windham Middle School** - Below are Word documents that Jane Cook developed for her ETS Workshop series. They contain information and resources related to the effective teaching strategies researched by Marzano and his colleagues:

- HANDOUT for Effective Teaching Strategies Session 1 developed by Jane Cook.doc
- HANDOUT for Effective Teaching Strategies Session 2 developed by Jane Cook.doc
- HANDOUT for Effective Teaching Strategies Session 3 developed by Jane Cook.doc
- HANDOUT for Effective Teaching Strategies Session 4 developed by Jane Cook.doc

25. **Other websites:**

http://www.tv411.org/lessons/cfm/reading.cfm?str=reading&num=6&act=1
Very fundamental presentation about summarizing using slides. Grade school level.

http://www.mantex.co.uk/samples/summary.htm
Mantex description follows.

http://reading.ecb.org/teacher/summarizing/index.html
Grade school level. Short videos (put into your own words)

http://www.netc.org/focus/strategies/summ.php
Focus on Effectiveness. Web page/fact sheet/guide follows.

http://www.specialconnections.ku.edu/cgi-bin/cgiwrap/specconn/main.php?cat=instruction&subsection=rc/paragraph

University of Kansas, Special Connections. Web page/fact sheet follows.

http://www.kidbibs.com/learningtips/lt33.htm
Grade school level. Web page/fact sheet/guide follows.

http://wvde.state.wv.us/strategybank/summarization.html
West Virginia Department of Education summarization techniques. Web page/fact sheet follows.

http://www.teachervision.fen.com/skill-builder/reading-comprehension/48785.html
TeacherVision, Pearson Education. Web page/fact sheet/guide follows.

http://forpd.ucf.edu/strategies/stratsummarization.html
This is a more cognitive approach to summarizing which is good. Web page/fact sheet/guide with example teaching aids.

http://www.lib.usm.edu/legacy/plag/paraphrasing.php

http://www.readingrockets.org/strategies/summarizing

http://www.bridgewater.edu/WritingCenter/Workshops/summariztips.htm

http://chiron.valdosta.edu/dtwasieleski/artisumm.htm

http://www.liketoread.com/read_strats_summarize.php

http://www.montgomeryschoolsmd.org/departments/development/resources/strategies/index.shtm

http://owl.english.purdue.edu/owl/resource/563/01/

APPENDIX B

Topic Interest Inventory (blank form)

TOPIC INTEREST INVENTORY

PRINT YOUR NAME: _____

The common definition for *interest* is a sense of concern with and curiosity about someone or something. The purpose of this inventory is to rank your personal interest in subjects you typically like to read about in newspapers, magazines or books. Please follow the step-by-step procedure below. Do not skip any steps.

Procedure

1. Open your envelope. It has 3 *Interest Level* cards (High, Medium, Low) and 11 *Subject Interest* cards. Place the *Subject Interest* cards in their order of interest—from the *most interesting* (first card) to the *least interesting* (last card) to you. You may arrange these subject cards on the table or in your hands. Please take your time and think about your interest in each subject. Do not write on the cards.

2. When you are finished ranking the subject cards from the most to least interesting, write the ranking numbers from 1 (*most interesting*) to 11 (*least interesting*) next to their subjects listed below. There should be no ties in your ranking.

   __ Local & National News
   __ World News
   __ Opinion – Editorial
   __ Education
   __ Travel
   __ Sports
   __ Technology
   __ Health
   __ Arts (including Music, Literature, Theatre, Dance)
   __ Politics
   __ Science

3. Now spread out the three *Interest Level* cards in front of you and lay your *Subject Level* cards in piles that correspond to high, medium, or low interest level for you. Your cards don't have to be in a specific rank order in the interest piles. Think of this process as merely grouping them according to your interest level. Again, please take your time and think about your interest level in each subject.

4. After you finish grouping your interest cards into high, medium, and low level piles, write the corresponding letter of your interest level next to each subject listed below by placing an H for High, M for Medium, and L for Low interest:

__ Local & National News	__ Technology
__ World News	__ Health
__ Opinion – Editorial	__ Arts
__ Education	__ Politics
__ Travel	__ Science
__ Sports	

5. Please insert all the cards and this inventory back into your envelope and return it to the facilitator. Make sure your name is printed clearly at the top of this form. **THANK YOU!**

APPENDIX C

Grading Rubric for Summaries

Grading Rubric for Summaries

LEVELS/ CRITERIA	Needs to Improve 1	Adequate 2	Proficient 3	Exemplary 4	Score
I. MAIN IDEAS: Captures only the main ideas of original text.	Does not restate main ideas or vaguely covers main ideas.	Some main ideas are restated and incomplete grasp of main ideas.	Most main ideas are restated and fairly good grasp of main ideas.	Completely restates only main ideas and obviously has clear grasp of main ideas.	
II. ACCURATE: Reflects meaning without distorting or slanting information.	Obviously distorted or inaccurate or very slanted information.	Some distortion or inaccuracies of the original information.	Only slight slanting or minor inaccuracy of the original information.	Objectively and accurately presented information.	
III. WORDS & STYLE: Written in own words and sentence structure.	Obviously same words/phrases and sentence structure as original. Four or more grammar and punctuation errors and/or very awkward.	Many of the same words/phrases and similarities in sentence structure as original. No more than three errors in grammar and punctuation and/or somewhat awkward.	Mostly in own words/phrases and sentence structure. No more than two minor errors in grammar and punctuation (no comma splices, run-ons or fragments) and/or slightly awkward.	All in own words/phrases (except brief subject and/or factual words) and sentence structure. No grammatical or punctuation errors and natural style.	
IV. CONCISELY ORGANIZED: Omits unnecessary details from original text and is well organized.	Includes too many unnecessary details or very wordy or information seems randomly placed and disjointed.	Includes some unnecessary details or some wordiness or information is only somewhat organized and hard to follow or choppy.	May include only a couple of unnecessary details and slightly wordy but information is arranged in an orderly and logical manner.	Concisely worded, has no unnecessary details and information is well organized and easy to read with transitions.	
V. LENGTH: Between 1/4 to 1/3 the length of the original text.	Not a summary and about same length as original or much less than 1/4 (15% or less) of original.	Summary is longer than 1/2 of original or less than 1/4 (16% - 20%) of original.	Summary is between 1/3 to1/2 the length of original or less than 1/4 (21% - 24%) of original.	Summary is appropriate length -- between 1/4 to 1/3 of original.	

COMMENTS:

Total: _____

APPENDIX D

Summary Writing Tutorial: Booklet A

Summary Writing Tutorial: Introduction

Purpose:

The purpose of this tutorial is to learn how to write a summary. You will write two summaries.

Contents:

This tutorial has six sections that will take you one hour and 30 minutes to complete. You will have one three-minute break about halfway through the material. You must complete all sections and write your responses in this booklet. You need to stop at the end of each section when you see the instructions for you to STOP. Do not turn the page until you are told to do so by your instructor.

Section	Minutes	Contents
-	2	Introduction
1	10	Summarization: Pre-test
2	12	Instructions for How to Write a Summary
3	25	Summary Writing: Politics
	3	Break
4	25	Summary Writing: Ballet
5	8	Summarization: Post-test
6	5	Satisfaction Survey
	90	Total time (1 hr. 30 min.)

Confidentiality:

All responses are anonymous and confidential. They will be used for research only. Do not write your name in this booklet. Enter your individual code only.

Your individual code is the first three letters of your mother's maiden name plus the last four digits of your Social Security Number. For example, if your mother's maiden name were *Brown* and the last four digits of your Social Security Number were *4997*, your code would be *Bro4997*. Please enter your seven-digit code on the lines below:

____ ____ ____ ____ ____ ____ ____

Thank you in advance for your time in taking this tutorial.

Section 1

Summarization: Pre-test

- **You have 10 minutes to complete this section.**

Please turn to the next page now.

SUMMARIZATION: PRE-TEST

There are three ways to include information from original sources into a research paper: quotations, paraphrases, and summaries. The following 10 questions focus only how to write a summary.

PLEASE CIRCLE EITHER T or F FOR THE FOLLOWING STATEMENTS.

		CIRCLE ONE	
1	Your summary of an original paragraph should be a shorter version, only about 1/2 to 3/4 (50%-75%) as long as the original.	T	F
2	Your summary should concisely capture only the main ideas of the original text.	T	F
3	Your summary should restate the main ideas of the original text in your own words.	T	F
4	Your summary should restate the main ideas of the original text in a writing style similar to the original text.	T	F
5	Your summary should include minor details in the original text.	T	F
6	Your summary should be a subjective interpretation of the original text.	T	F
7	Your summary may not have the same general order of ideas as the original text.	T	F
8	Your summary may borrow phrases from the original text without using quotation marks.	T	F

9 **READ THE ORIGINAL TEXT BELOW:**

Not so long ago, Target was the popular kid on the block, and Wal-Mart was working diligently to soften its image among some as an uncool bully. What a difference a year makes. A widening housing crisis, sporadic spikes in food and fuel prices, and a massive meltdown in the global financial markets have led to a reversal of fortunes among the nation's top two discount retailers. Now Target is the one trying to get noticed. (76 words)

SELECT THE BEST SUMMARY BY CIRCLING THE APPROPRIATE LETTER ON THE RIGHT.

SUMMARY A: A
After a year of financial crisis the images of Wal-Mart and Target have reversed. Wal-Mart is now perceived positively and Target must rebuild their image. (25 words; 33% as long as original)

SUMMARY B: B
A year can make a big difference. Wal-Mart was once viewed as the uncool bully and Target had a better image. Now Target has to try to be the popular kid again. (32 words; 42% as long as original)

SUMMARY C: C
It was only a year ago that Target was considered more popular than Wal-Mart, and Wal-Mart needed a strategy to improve its tough guy image. The housing crisis and food prices, to mention a few problems, have led to a reversal in who is getting noticed among these top two retailers. (51 words; 67% as long as original)

10 **READ THE ORIGINAL TEXT BELOW:**

When Karyn Hodgen's son was 7, money went through his hands like sand through a sieve. As soon as he got a couple of dollars from his allowance or a birthday gift, it was spent. Frustrated, his parents sat him down one night at the computer and showed him—on an Excel spreadsheet—how a single $100 investment could pile up faster than a stack of Lego bricks. (68 words)

SELECT THE BEST SUMMARY BY CIRCLING THE APPROPRIATE LETTER ON THE RIGHT.

SUMMARY A: A
Karyn's 7-year-old spent money freely but then his parents showed him how quickly it can be saved. (19 words; 27% as long as original)

SUMMARY B: B
Allowances and birthday gift dollars went through the hands of Karyn's son's like a sieve until his parents showed him in an Excel spreadsheet how quickly money piles up. (29 words; 42% as long as original)

SUMMARY C: C
Karyn's 7-year-old son would spend money without thinking. Frustrated, his parents demonstrated—via a spreadsheet—how a small investment can grow faster than stacking up plastic bricks. (27 words; 40% as long as original)

End of Section 1

STOP

Please do not turn the page until you are instructed to do so.

Section 2

Instructions for How to Write Summary

- **Your instructor will guide you through this section.**
- **You have 12 minutes to complete this section.**

Please turn to the next page now.

INSTRUCTIONS FOR HOW TO WRITE SUMMARY

1. What are the benefits of writing a summary?

- A summary is a good way to smoothly integrate information from other sources into an academic paper because it is written in your own words and writing style.
- A summary helps you to better understand what you read and then to use the information to more clearly support your own ideas in an academic paper.
- A summary is often more effective and efficient than a quotation when you include information from other sources in an academic paper.

2. What are the basic features of a summary?

- A summary includes only the central ideas (essential meaning or main points) of a passage.
- A summary is a much shorter version of a passage--¼ to 1/3 (25%-33%) the length of the original.
- A summary restates the central ideas of a passage in your own words, sentence structure, and writing style. However, the *order* of the ideas may be the same as the original passage.

Original Source Text. Please read the following paragraph a couple of times. When you think you understand the central ideas of the paragraph, circle or underline what you feel are the main points.

The commissioners of the state's tourism and economic development agency, including some newly elected members and many veteran officials, met early Thursday at 8 a.m. at the old courthouse downtown. In their initial and tense deliberations they discussed and then hotly debated a common problem that is seriously impacting their confidence in making their economic forecasts for the upcoming fiscal year. The state of Arkansas, according to several independent national surveys, has a dreary image in the minds of many tourists who have never visited the state. This negative perception is a huge hurdle that these politicians feel incapable of understanding on their own and they decided to first hire an expensive consulting firm from New York to research and compile a report within one month for further study and analysis before they can move forward with their budget recommendations. *(140 words)*

DO NOT TURN THE PAGE UNTIL YOU ARE INSTRUCTED TO DO SO.

4. Summary of Original Source Text. Here is a summary of the previous passage. Notice how it restates the central ideas of the passage in different words, sentence structure, and writing style. Also notice how it is much shorter than the original text—between 1/4 to 1/3 the length of the original passage.

Arkansas commissioners debated the gloomy image tourists seem to have about their state that is preventing the commissioners from developing a financial forecast for the coming year. Therefore, they decided to hire a consulting firm to write a report to review before drawing up a new budget. (47 words = 33%)

5. In the next Section 3 you will be asked to circle or underline the main ideas of an original text passage, just like you did here for the previous passage, before you write your own summary.

End of Section 2

STOP

Please do not turn the page until you are instructed to do so.

Section 3

Summary Writing: Politics

- **You have 25 minutes to complete this section.**

Please turn to the next page now.

SUMMARY WRITING: POLITICS

STEP ONE. Please read and reread the following paragraph a couple of times. When you think you understand the central ideas (main points) of the paragraph, circle or underline what you feel are the main points. Do not write notes on this page.

In a stunning reversal, the House of Representatives on Friday, October 4, 2008, voted 263-171 to pass an historic $700 billion measure to rescue the financial sector, acting just days after initially defeating the plan. President Bush immediately signed the bill into law. Fifty-eight lawmakers who opposed the bill when it was defeated Monday by a 228-205 vote reversed their position and voted "yea." The Senate approved the measure Wednesday 74-25. "By coming together on this legislation we have acted boldly to help prevent the crisis on Wall Street from becoming a crisis in communities across our country," Bush said at the White House after the bill was approved.

[NOTE: There are 109 words in this text.]

STEP TWO. Write a summary based on your underlined or circled words. Restate only the central ideas (main points) of the paragraph. Use your own wording and writing style. Your summary should be at least 27 words (1/4 the length of original) and not exceed 36 words (1/3 the length of original). Please write neatly and clearly.

STEP THREE: After you have finished writing your summary above, compare your completed summary with the original paragraph. See if you left out any central ideas (main points) OR if you included any unnecessary details, redundant language, or minor details. If you need to edit your summary, please add, delete, or change the wording as needed. Make your corrections neatly and clearly so that all your words are completely legible. **You may turn to the next page** to write your final edited summary.

STEP THREE (continued). You may use this space to write your final edited summary.

End of Section 3

STOP

Please do not turn the page until you are instructed to do so.

Section 4

Summary Writing: Ballet

- **You have 25 minutes to complete this section.**

Please turn to the next page now.

SUMMARY WRITING: BALLET

STEP ONE. Please read and reread the following paragraph a couple of times. When you think you understand the central ideas (main points) of the paragraph, circle or underline what you feel are the main points. Do not write notes on this page.

In his music for "Coppélia" (1870), Delibes gave 19th-century ballet its first great narrative score with classic melody, orchestration, rhythm, and storytelling. The miracle of the overture's tune for the strings, a flood of slow sweetness and radiance, was overwhelming for the umpteenth time on Wednesday at New York City Ballet's production of this three-act ballet, conducted by Kaplow. This melody is reprised in Act II at the heart of the story. Dr. Coppélius — toymaker, inventor, magician — wheels, to center stage, the perfect young woman of (he thinks) his own manufacture, seated lifeless on her chair. Because we've seen his Coppélia before in Act I, we know one thing he doesn't: the feminine ideal seated on his portable throne is not the one he made but the capricious real-life Swanilda who intruded into his lair when he was out.

[NOTE: There are 139 words in this text.]

STEP TWO: Write a summary based on your underlined or circled words. Restate only the central ideas (main points) of the paragraph. Use your own wording and writing style. Your summary should be at least 35 words (1/4 the length of original) and not exceed 46 words (1/3 the length of original). Please write neatly and clearly.

STEP THREE: Now compare your completed summary above with the original paragraph to see if you left out any central ideas (main points) OR if you included any unnecessary details, redundant language, or minor details. If you need to edit your summary, please add, delete, or change the wording as needed. Make your corrections neatly and clearly so that all words are completely legible. **You may turn to the next page** to write your final edited summary.

STEP THREE (continued). You may use this space to write your final edited summary.

End of Section 4

STOP

Please do not turn the page until you are instructed to do so.

Section 5

Summarization: Post-test

- **You have 8 minutes to complete this section.**

Please turn to the next page now.

SUMMARIZATION: POST-TEST

There are three ways to include information from original sources into a research paper: quotations, paraphrases, and summaries. The following 10 questions focus only how to write a summary.

PLEASE CIRCLE EITHER T or F FOR THE FOLLOWING STATEMENTS.

		CIRCLE ONE	
1	Your summary may <u>not</u> borrow phrases from the original text <u>without</u> using quotation marks.	T	F
2	Your summary should be an objective restatement of the original text.	T	F
3	Your summary should restate the main ideas of the original text in your own writing style.	T	F
4	Your summary should capture every idea of the original text.	T	F
5	Your summary of an original paragraph should be a shorter version, only about 1/4 to 1/3 (25%-33%) as long as the original.	T	F
6	Your summary should <u>not</u> restate the main ideas of the original text in your own words.	T	F
7	Your summary should <u>not</u> include minor details in the original text.	T	F
8	Your summary may have the same general order of ideas as the original text.	T	F

9 **READ THE ORIGINAL TEXT BELOW:**

When Karyn Hodgen's son was 7, money went through his hands like sand through a sieve. As soon as he got a couple of dollars from his allowance or a birthday gift, it was spent. Frustrated, his parents sat him down one night at the computer and showed him—on an Excel spreadsheet—how a single $100 investment could pile up faster than a stack of Lego bricks. (68 words)

SELECT THE BEST SUMMARY BY CIRCLING THE APPROPRIATE LETTER ON THE RIGHT.

SUMMARY A: A
Karyn's 7-year-old son would spend money without thinking. Frustrated, his parents demonstrated—via a spreadsheet—how a small investment can grow faster than stacking up plastic bricks. (27 words; 40% as long as original)

SUMMARY B: B
Karyn's 7-year-old spent money freely but then his parents showed him how quickly it can be saved. (19 words; 27% as long as original)

SUMMARY C: C
Allowances and birthday gift dollars went through the hands of Karyn's son's like a sieve until his parents showed him in an Excel spreadsheet how quickly money piles up. (29 words; 42% as long as original)

10 **READ THE ORIGINAL TEXT BELOW:**

Not so long ago, Target was the popular kid on the block, and Wal-Mart was working diligently to soften its image among some as an uncool bully. What a difference a year makes. A widening housing crisis, sporadic spikes in food and fuel prices, and a massive meltdown in the global financial markets have led to a reversal of fortunes among the nation's top two discount retailers. Now Target is the one trying to get noticed. (76 words)

SELECT THE BEST SUMMARY BY CIRCLING THE APPROPRIATE LETTER ON THE RIGHT.

SUMMARY A: A
A year can make a big difference. Wal-Mart was once viewed as the uncool bully and Target had a better image. Now Target has to try to be the popular kid again. (32 words; 42% as long as original)

SUMMARY B: B
It was only a year ago that Target was considered more popular than Wal-Mart, and Wal-Mart needed a strategy to improve its tough guy image. The housing crisis and food prices, to mention a few problems, have led to a reversal in who is getting noticed among these top two retailers. (51 words; 67% as long as original)

SUMMARY C: C
After a year of financial crisis the images of Wal-Mart and Target have reversed. Wal-Mart is now perceived positively and Target must rebuild their image. (25 words; 33% as long as original)

End of Section 5

STOP

Please do not turn the page until you are instructed to do so.

Section 6

Satisfaction Survey

- **You have 5 minutes to complete this section.**

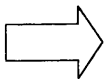
Please turn to the next page now.

SATISFACTION SURVEY

Directions: For each statement please circle the number that represents your level of agreement or disagreement (strongly disagree [1] to strongly agree [5]).

	Strongly Disagree				***Strongly Agree***
1. The paragraph on politics ($700 billion measure) was easy for me to summarize.	1	2	3	4	5
2. The paragraph on ballet (Coppelia) was easy for me to summarize.	1	2	3	4	5
3. The underlining/circling of words helped me to identify the main ideas in the paragraph on politics ($700 billion measure).	1	2	3	4	5
4. The underlining/circling of words helped me to identify the main ideas in the paragraph on ballet (Coppelia).	1	2	3	4	5
5. I found the paragraph on politics ($700 billion measure) to be interesting.	1	2	3	4	5
6. I found the paragraph on ballet (Coppelia) to be interesting.	1	2	3	4	5
7. This tutorial was a good way to learn how to summarize passages.	1	2	3	4	5
8. I had enough time to write my summaries.	1	2	3	4	5

Continue to the next page.



Directions: Please mark each item below that best describes you.

1. Your Gender: ☐ Female ☐ Male

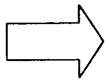
2. Your Age Bracket:
   - ☐ 20 – 29
   - ☐ 30 – 39
   - ☐ 40 – 49
   - ☐ 50 – 59
   - ☐ 60 and over

3. Your major:
   - ☐ Organizational Behavior/Leadership
   - ☐ Applied Economics
   - ☐ Public Administration
   - ☐ Other _____

4. Have you had instruction on how to write a summary in another college course?
   - ☐ Yes. How many courses? ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more
     How long ago? Year _____
   - ☐ No

5. Would you be willing to participate in a follow-up interview about this tutorial?
   ☐ Yes ☐ No

Continue to the next page.



Directions: Your comments are appreciated in the space below (optional).

You are done.

Thank you!

APPENDIX E

Summary Writing Tutorial: Booklet B

Summary Writing Tutorial

Booklet B

Summary Writing Tutorial: Introduction

Purpose:

The purpose of this tutorial is to learn how to write a summary. You will write two summaries.

Contents:

This tutorial has six sections that will take you one hour and 30 minutes to complete. You will have one three-minute break about halfway through the material. You must complete all sections and write your responses in this booklet. You need to stop at the end of each section when you see the instructions for you to STOP. Do not turn the page until you are told to do so by your instructor.

Section	Minutes	Contents
-	2	Introduction
1	10	Summarization: Pre-test
2	12	Instructions for How to Write a Summary
3	25	Summary Writing: Politics
	3	Break
4	25	Summary Writing: Ballet
5	8	Summarization: Post-test
6	5	Satisfaction Survey
	90	Total time (1 hr. 30 min.)

Confidentiality:

All responses are anonymous and confidential. They will be used for research only. Do not write your name in this booklet. Enter your individual code only.

Your individual code is the first three letters of your mother's maiden name plus the last four digits of your Social Security Number. For example, if your mother's maiden name were *Brown* and the last four digits of your Social Security Number were *4997*, your code would be *Bro4997*. Please enter your seven-digit code on the lines below:

____ ____ ____ ____ ____ ____ ____

Thank you in advance for your time in taking this tutorial.

Section 1

Summarization: Pre-test

- **You have 10 minutes to complete this section.**

Please turn to the next page now.

SUMMARIZATION: PRE-TEST

There are three ways to include information from original sources into a research paper: quotations, paraphrases, and summaries. The following 10 questions focus only how to write a summary.

PLEASE CIRCLE EITHER T or F FOR THE FOLLOWING STATEMENTS.

		CIRCLE ONE	
1	Your summary of an original paragraph should be a shorter version, only about 1/2 to 3/4 (50%-75%) as long as the original.	T	F
2	Your summary should concisely capture only the main ideas of the original text.	T	F
3	Your summary should restate the main ideas of the original text in your own words.	T	F
4	Your summary should restate the main ideas of the original text in a writing style similar to the original text.	T	F
5	Your summary should include minor details in the original text.	T	F
6	Your summary should be a subjective interpretation of the original text.	T	F
7	Your summary may not have the same general order of ideas as the original text.	T	F
8	Your summary may borrow phrases from the original text without using quotation marks.	T	F

9 **READ THE ORIGINAL TEXT BELOW:**

Not so long ago, Target was the popular kid on the block, and Wal-Mart was working diligently to soften its image among some as an uncool bully. What a difference a year makes. A widening housing crisis, sporadic spikes in food and fuel prices, and a massive meltdown in the global financial markets have led to a reversal of fortunes among the nation's top two discount retailers. Now Target is the one trying to get noticed. (76 words)

SELECT THE BEST SUMMARY BY CIRCLING THE APPROPRIATE LETTER ON THE RIGHT.

SUMMARY A: A
After a year of financial crisis the images of Wal-Mart and Target have reversed. Wal-Mart is now perceived positively and Target must rebuild their image. (25 words; 33% as long as original)

SUMMARY B: B
A year can make a big difference. Wal-Mart was once viewed as the uncool bully and Target had a better image. Now Target has to try to be the popular kid again. (32 words; 42% as long as original)

SUMMARY C: C
It was only a year ago that Target was considered more popular than Wal-Mart, and Wal-Mart needed a strategy to improve its tough guy image. The housing crisis and food prices, to mention a few problems, have led to a reversal in who is getting noticed among these top two retailers. (51 words; 67% as long as original)

10 **READ THE ORIGINAL TEXT BELOW:**

When Karyn Hodgen's son was 7, money went through his hands like sand through a sieve. As soon as he got a couple of dollars from his allowance or a birthday gift, it was spent. Frustrated, his parents sat him down one night at the computer and showed him—on an Excel spreadsheet—how a single $100 investment could pile up faster than a stack of Lego bricks. (68 words)

SELECT THE BEST SUMMARY BY CIRCLING THE APPROPRIATE LETTER ON THE RIGHT.

SUMMARY A: A
Karyn's 7-year-old used to spent money freely but then his parents showed him how quickly it can be saved. (19 words; 27% as long as original)

SUMMARY B: B
Allowances and birthday gift dollars went through the hands of Karyn's son's like a sieve until his parents showed him in an Excel spreadsheet how quickly money piles up. (29 words; 42% as long as original)

SUMMARY C: C
Karyn's 7-year-old son would spend money without thinking. Frustrated, his parents demonstrated—via a spreadsheet—how a small investment can grow faster than stacking up plastic bricks. (27 words; 40% as long as original)

End of Section 1

STOP

Please do not turn the page until you are instructed to do so.

Section 2

Instructions for How to Write Summary

- **Your instructor will guide you through this section.**
- **You have 12 minutes to complete this section.**

Please turn to the next page now.

INSTRUCTIONS FOR HOW TO WRITE SUMMARY

1. **What are the benefits of writing a summary?**

   - A summary is a good way to smoothly integrate information from other sources into an academic paper because it is written in your own words and writing style.
   - A summary helps you to better understand what you read and then to use the information to more clearly support your own ideas in an academic paper.
   - A summary is often more effective and efficient than a quotation when you include information from other sources in an academic paper.

2. **What are the basic features of a summary?**

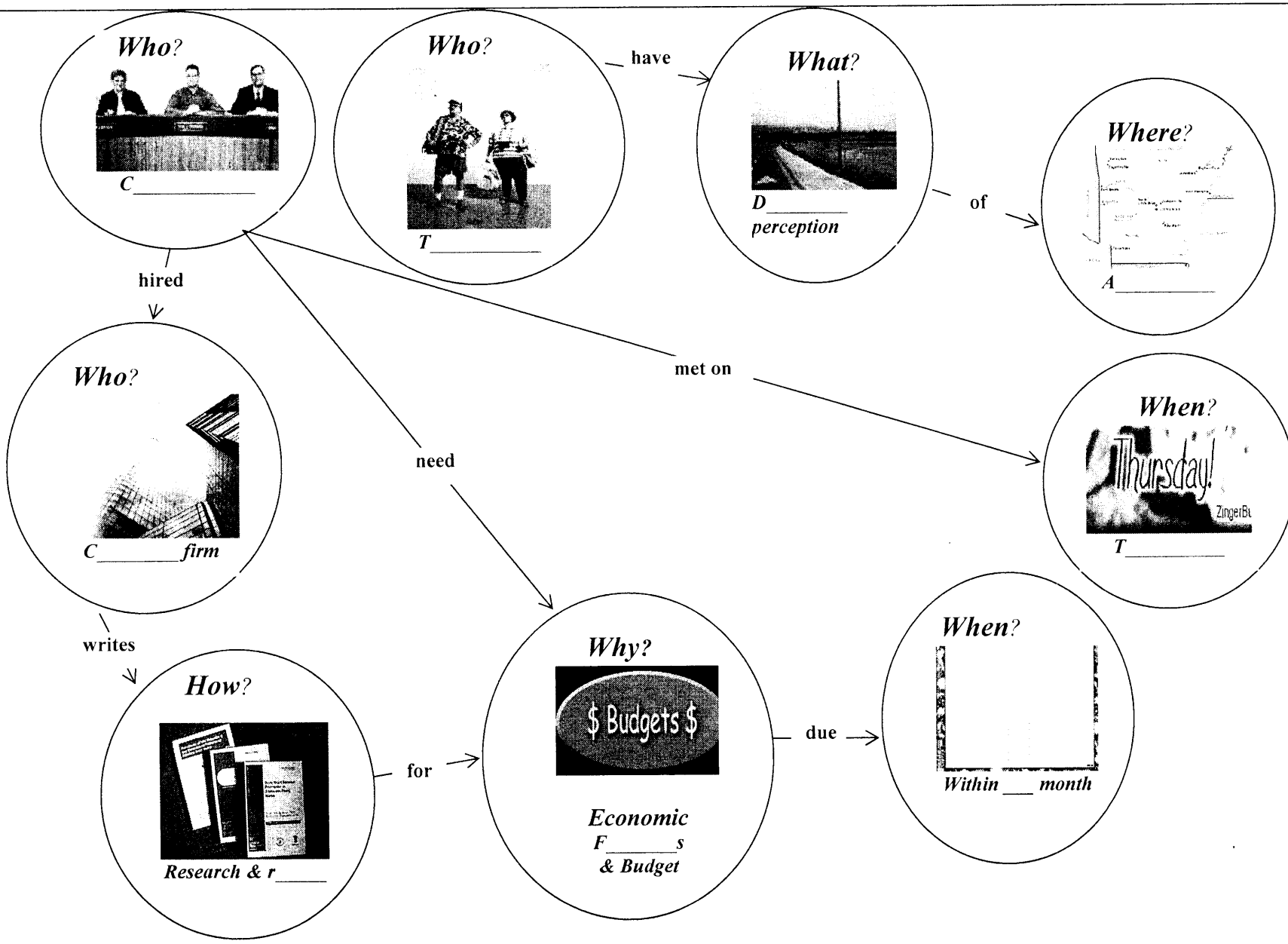
   - A summary includes only the central ideas (essential meaning or main points) of a passage.
   - A summary is a much shorter version of a passage--¼ to 1/3 (25%-33%) the length of the original.
   - A summary restates the central ideas of a passage in your own words, sentence structure, and writing style. However, the *order* of the ideas may be the same as the original passage.

. **Original Source Text.** Please read and reread the following paragraph a couple of times until you think you understand the central ideas of the paragraph.

The commissioners of the state's tourism and economic development agency, including some newly elected members and many veteran officials, met early Thursday at 8 a.m. at the old courthouse downtown. In their initial and tense deliberations they discussed and then hotly debated a common problem that is seriously impacting their confidence in making their economic forecasts for the upcoming fiscal year. The state of Arkansas, according to several independent national surveys, has a dreary image in the minds of many tourists who have never visited the state. This negative perception is a huge hurdle that these politicians feel incapable of understanding on their own and they decided to first hire an expensive consulting firm from New York to research and compile a report within one month for further study and analysis before they can move forward with their budget recommendations. *(140 words)*

DO NOT TURN THE PAGE UNTIL YOU ARE INSTRUCTED TO DO SO

4. Summary of Original Source Text. Here is a pictorial map of the previous passage. Fill in all the blanks below based on your understanding of the central ideas in the previous paragraph. Note how this pictorial map uses the questions *Who? What? Where? When? Why? How?* to connect the ideas. **You may look back at the original source passage. After you fill in all the blanks, study the images and linked line text**. DO NOT TURN TO NEXT PAGE.



4. **Summary of Original Source Text (CONTINUED).** Here is a summary of the original passage based on the pictorial map. Notice how it restates the central ideas of the passage in different words, sentence structure, and writing style. Also notice how it is much shorter than the original text—between 1/4 to 1/3 the length of the original passage.

Arkansas commissioners debated the gloomy image tourists seem to have about their state that is preventing the commissioners from developing a financial forecast for the coming year. Therefore, they decided to hire a consulting firm to write a report to review before drawing up a new budget. (47 words = 33%)

5. In the next Section 3 you will be asked to fill in the blanks of a pictorial map based on an original text passage, just like you did here for the previous passage, before you write your own summary.

End of Section 2

STOP

Please <u>do not turn the page</u> until you are instructed to do so.

Section 3

Summary Writing: Politics

- **You have 25 minutes to complete this section.**

Please turn to the next page now.

SUMMARY WRITING: POLITICS

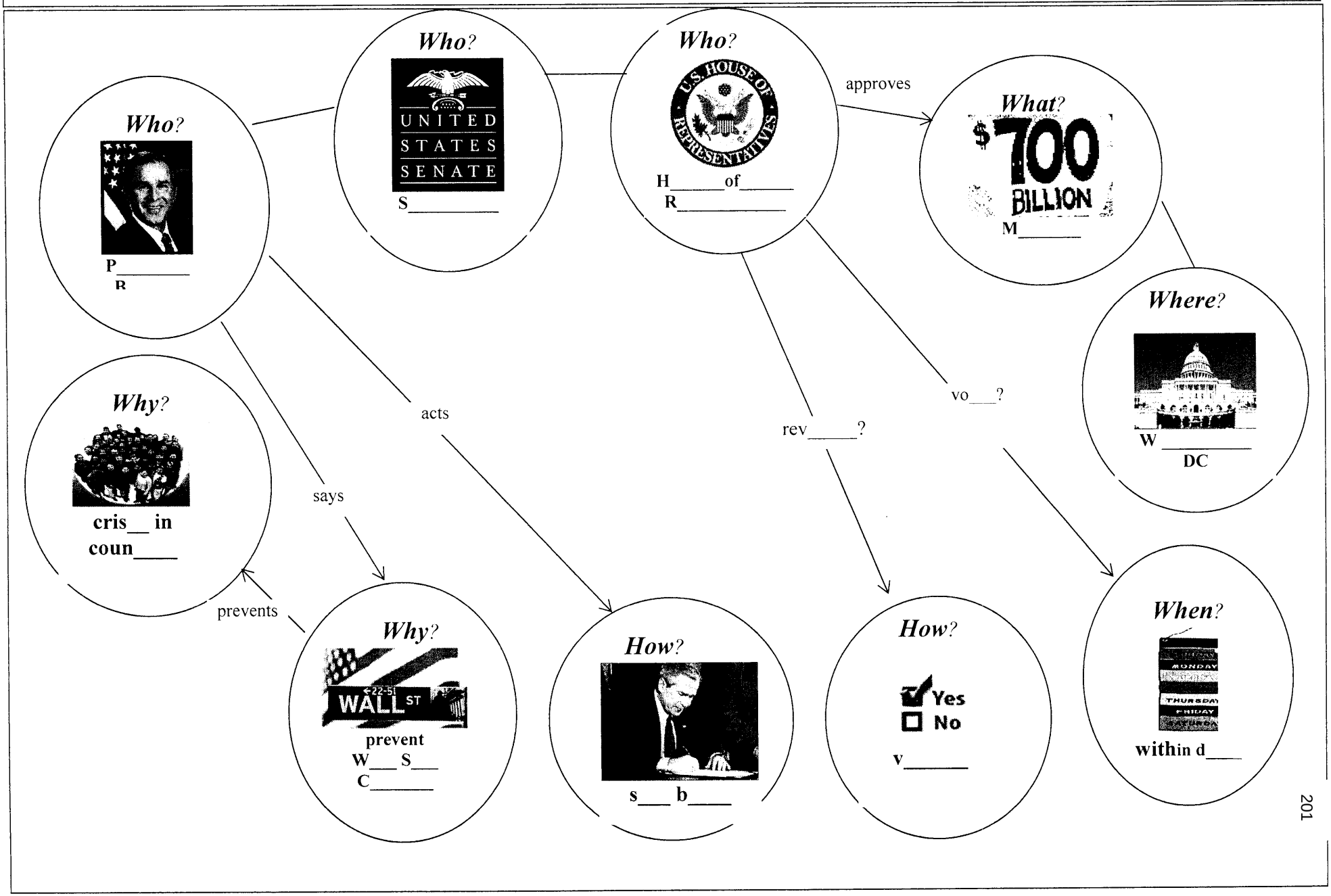
STEP ONE. Please read and reread the following paragraph a couple of times until you think you understand the central ideas (main points) of the paragraph. Do not write notes on this page.

In a stunning reversal, the House of Representatives on Friday, October 4, 2008, voted 263-171 to pass an historic $700 billion measure to rescue the financial sector, acting just days after initially defeating the plan. President Bush immediately signed the bill into law. Fifty-eight lawmakers who opposed the bill when it was defeated Monday by a 228-205 vote reversed their position and voted "yea." The Senate approved the measure Wednesday 74-25. "By coming together on this legislation we have acted boldly to help prevent the crisis on Wall Street from becoming a crisis in communities across our country," Bush said at the White House after the bill was approved.

[NOTE: There are 109 words in this text.]

DO NOT TURN THE PAGE UNTIL YOU ARE INSTRUCTED TO DO SO.

STEP ONE. Here is a pictorial map of the previous passage. Fill in all the blanks below based on your understanding of the central ideas in the previous paragraph. Note how this pictorial map uses the questions *Who? What? Where? When? Why? How?* to connect the ideas. **You may look back at the original text passage. After you fill in all the blanks, study the images and linked line text.** DO NOT TURN TO NEXT PAGE.



STEP TWO. Write a summary based on the pictorial map on the previous page. Restate only the central deas (main points) of the paragraph. Use your own wording and writing style. Your summary should be at least 27 words (1/4 the length of original) and not exceed 36 words (1/3 the length of original). You may flip back to the pictorial map as often as needed to write your summary but do not look at the original text passage. Please write neatly and clearly.

STEP THREE: After you have finished writing your summary above, compare your completed summary above with the original text paragraph. See if you left out any central ideas (main points) OR if you ncluded any unnecessary details, redundant language, or minor details. If you need to edit your summary, please add, delete, or change the wording as needed. Make your corrections neatly and clearly so that all your words are completely legible. **You may use the space below** to write your final edited summary.

End of Section 3

STOP

Please do not turn the page until you are instructed to do so.

Section 4

Summary Writing: Ballet

- **You have 25 minutes to complete this section.**

Please turn to the next page now.

SUMMARY WRITING: BALLET

STEP ONE. Please read and reread the following paragraph a couple of times until you think you understand the central ideas (main points) of the paragraph. Do not write notes on this page.

In his music for "Coppélia" (1870), Delibes gave 19th-century ballet its first great narrative score with classic melody, orchestration, rhythm, and storytelling. The miracle of the overture's tune for the strings, a flood of slow sweetness and radiance, was overwhelming for the umpteenth time on Wednesday at New York City Ballet's production of this three-act ballet, conducted by Kaplow. This melody is reprised in Act II at the heart of the story. Dr. Coppélius — toymaker, inventor, magician — wheels, to center stage, the perfect young woman of (he thinks) his own manufacture, seated lifeless on her chair. Because we've seen his Coppélia before in Act I, we know one thing he doesn't: the feminine ideal seated on his portable throne is not the one he made but the capricious real-life Swanilda who intruded into his lair when he was out.

[NOTE: There are 139 words in this text.]

DO NOT TURN THE PAGE UNTIL YOU ARE INSTRUCTED TO DO SO.

STEP ONE. Here is a pictorial map of the previous passage. Fill in <u>all</u> the blanks below based on your understanding of the central ideas in the previous paragraph. Note how this pictorial map uses the questions *Who? What? Where? When? Why? How?* to connect the ideas. **You may look back at the original text passage. After you fill in <u>all</u> the blanks, study the images and linked line text.** DO NOT TURN TO NEXT PAGE.

Who?

D_____

Who?

K_____

__ con_____?

What?

Th___ -____ ballet

Where?

NYC _____

Who?

Dr. C_____

comp_____?

thinks

does not know

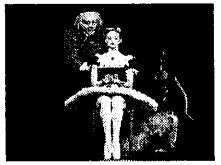
When?

W _____

Why?

real- ____S_____

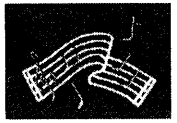
What?



perfect

w_____

How?



m_____

_____

_____

STEP TWO. Write a summary based on the pictorial map on the previous page. Restate only the central ideas (main points) of the paragraph. Use your own wording and writing style. Your summary should be at least 35 words (1/4 the length of original) and not exceed 46 words (1/3 the length of original).. You may flip back to the pictorial map as often as needed to write your summary but do not look at the original text passage. Please write neatly and clearly.

STEP THREE: After you have finished writing your summary above, compare your completed summary above with the original text paragraph. See if you left out any central ideas (main points) OR if you included any unnecessary details, redundant language, or minor details. If you need to edit your summary, please add, delete, or change the wording as needed. Make your corrections neatly and clearly so that all your words are completely legible. **You may use the space below** to write your final edited summary.

End of Section 4

STOP

Please do not turn the page until you are instructed to do so.

Section 5

Summarization: Post-test

- **You have 8 minutes to complete this section.**

Please turn to the next page now.

SUMMARIZATION: POST-TEST

There are three ways to include information from original sources into a research paper: quotations, paraphrases, and summaries. The following 10 questions focus only how to write a summary.

PLEASE CIRCLE EITHER T or F FOR THE FOLLOWING STATEMENTS.

		CIRCLE ONE	
1	Your summary may <u>not</u> borrow phrases from the original text <u>without</u> using quotation marks.	T	F
2	Your summary should be an objective restatement of the original text.	T	F
3	Your summary should restate the main ideas of the original text in your own writing style.	T	F
4	Your summary should capture every idea of the original text.	T	F
5	Your summary of an original paragraph should be a shorter version, only about 1/4 to 1/3 (25%-33%) as long as the original.	T	F
6	Your summary should <u>not</u> restate the main ideas of the original text in your own words.	T	F
7	Your summary should <u>not</u> include minor details in the original text.	T	F
8	Your summary may have the same general order of ideas as the original text.	T	F

9 **READ THE ORIGINAL TEXT BELOW:**

When Karyn Hodgen's son was 7, money went through his hands like sand through a sieve. As soon as he got a couple of dollars from his allowance or a birthday gift, it was spent. Frustrated, his parents sat him down one night at the computer and showed him—on an Excel spreadsheet—how a single $100 investment could pile up faster than a stack of Lego bricks. (68 words)

SELECT THE BEST SUMMARY BY CIRCLING THE APPROPRIATE LETTER ON THE RIGHT.

SUMMARY A: A
Karyn's 7-year-old son would spend money without thinking. Frustrated, his parents demonstrated—via a spreadsheet—how a small investment can grow faster than stacking up plastic bricks. (27 words; 40% as long as original)

SUMMARY B: B
Karyn's 7-year-old used to spent money freely but then his parents showed him how quickly it can be saved. (19 words; 27% as long as original)

SUMMARY C: C
Allowances and birthday gift dollars went through the hands of Karyn's son's like a sieve until his parents showed him in an Excel spreadsheet how quickly money piles up. (29 words; 42% as long as original)

10 **READ THE ORIGINAL TEXT BELOW:**

Not so long ago, Target was the popular kid on the block, and Wal-Mart was working diligently to soften its image among some as an uncool bully. What a difference a year makes. A widening housing crisis, sporadic spikes in food and fuel prices, and a massive meltdown in the global financial markets have led to a reversal of fortunes among the nation's top two discount retailers. Now Target is the one trying to get noticed. (76 words)

SELECT THE BEST SUMMARY BY CIRCLING THE APPROPRIATE LETTER ON THE RIGHT.

SUMMARY A: A
A year can make a big difference. Wal-Mart was once viewed as the uncool bully and Target had a better image. Now Target has to try to be the popular kid again. (32 words; 42% as long as original)

SUMMARY B: B
It was only a year ago that Target was considered more popular than Wal-Mart, and Wal-Mart needed a strategy to improve its tough guy image. The housing crisis and food prices, to mention a few problems, have led to a reversal in who is getting noticed among these top two retailers. (51 words; 67% as long as original)

SUMMARY C: C
After a year of financial crisis the images of Wal-Mart and Target have reversed. Wal-Mart is now perceived positively and Target must rebuild their image. (25 words; 33% as long as original))

End of Section 5

STOP

Please do not turn the page until you are instructed to do so.

Section 6

Satisfaction Survey

- **You have 5 minutes to complete this section.**

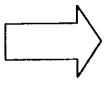
Please turn to the next page now.

SATISFACTION SURVEY

Directions: For each statement please circle the number that represents your level of agreement or disagreement (strongly disagree [1] to strongly agree [5]).

	Strongly Disagree				***Strongly Agree***
1. The paragraph on politics ($700 billion measure) was easy for me to summarize.	1	2	3	4	5
2. The paragraph on ballet (Coppelia) was easy for me to summarize.	1	2	3	4	5
3. The pictorial map (pictures/lines) helped me to identify the main ideas in the paragraph on politics ($700 billion measure).	1	2	3	4	5
4. The pictorial map (pictures/lines) helped me to identify the main ideas in the paragraph on ballet (Coppelia).	1	2	3	4	5
5. I found the paragraph on politics ($700 billion measure) to be interesting.	1	2	3	4	5
6. I found the paragraph on ballet (Coppelia) to be interesting.	1	2	3	4	5
7. This tutorial was a good way to learn how to summarize passages.	1	2	3	4	5
8. I had enough time to write my summaries.	1	2	3	4	5

Continue to the next page.



Directions: Please mark each item below that best describes you.

1. Your Gender: ☐ Female ☐ Male

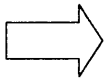
2. Your Age Bracket:
   - ☐ 20 – 29
   - ☐ 30 – 39
   - ☐ 40 – 49
   - ☐ 50 – 59
   - ☐ 60 and over

3. Your major:
   - ☐ Organizational Behavior/Leadership
   - ☐ Applied Economics
   - ☐ Public Administration
   - ☐ Other _____

4. Have you had instruction on how to write a summary in another college course?
   - ☐ Yes. How many courses? ☐ 1 ☐ 2 ☐ 3 ☐ 4 or more
     How long ago? Year _____
   - ☐ No

5. Would you be willing to participate in a follow-up interview about this tutorial?
   ☐ Yes ☐ No

Continue to the next page.



Directions: Your comments are appreciated in the space below (optional).

You are done.

Thank you!

APPENDIX F

Pilot Tutorial: How to Write a Summary from a Source Document (excerpt)

Findings: Post –Evaluation Discussion

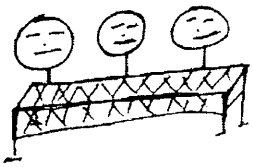
STEP 3. <u>Draw simple images of the key topics and points that were circled</u>.

(a) Let's use the following six journalistic questions to guide our choice of images:

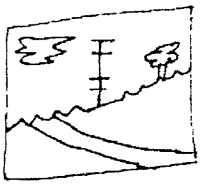
- *Who* are the people involved?
- *What* are the objects, events or ideas involved?
- *Where* are we or where is this?
- *When* is the time or the direction of time?
- *How* are people, objects, events, ideas related or impacting each other?
- *Why* do we know or want to know?

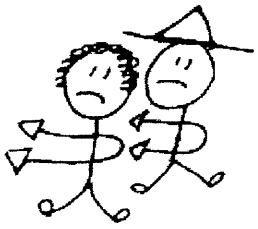
(b) Take a few minutes to think about each image.

***Who** are the people involved?* Commissioners debating…



***What** are the objects, events or ideas involved?* Dreary, negative perception… Tourists…



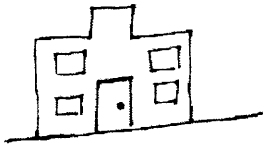


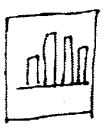
***Where** are we or where is this?* Arkansas…

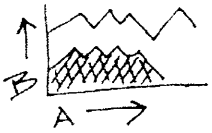
When *is the time or the direction of time?* Thursday… Within one month…

How *are people, objects, events, ideas related or impacting each other?*

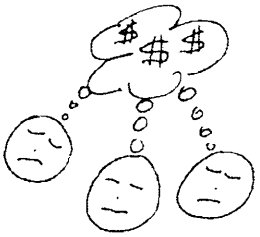
Consulting firm… Research and report…







Why *do we know or want to know?* Understand forecasts and budget for next fiscal year…



Post-Evaluation Discussion:

After the evaluation I had an open discussion with the class on the tutorial process for about 15 minutes. Except for one person who likes to draw, most of the class seemed to find the drawing steps non-productive. There were comments like "I hate to draw" and "Drawing is really difficult for me."

After I said that I was curious to know if the visual learning style students would find the visual thinking step (drawing pictures) of the tutorial easier or more enjoyable, a couple of students said that learning visually was a "whole lot different than drawing visuals because it's like you use another part of your brain." Another student said that if she was given the pictures in the tutorial to illustrate the same points they had to draw, it may have helped more because she was a visual learner. There seemed to be some agreement about the approach of using pictures.

A couple of students also mentioned that drawing did help them to get focused on some main ideas in the text but drawing did not help them as much in translating the text into their own words or writing style.

APPENDIX G

Representative Images Survey

Representative Images

		5 very representative 4 adequately representative 3 somewhat representative 2 not representative 1 counter representative
Commissioners of a State Agency		
A		5 4 3 2 1
B		5 4 3 2 1
C.		5 4 3 2 1
D		5 4 3 2 1

		5 very representative 4 adequately representative 3 somewhat representative 2 not representative 1 counter representative
Tourists		
A		5 4 3 2 1
B		5 4 3 2 1
C		5 4 3 2 1
D		5 4 3 2 1

		5 very representative 4 adequately representative 3 somewhat representative 2 not representative 1 counter representative
A dreary landscape		
A		5 4 3 2 1
B		5 4 3 2 1
C		5 4 3 2 1
D		5 4 3 2 1
E		5 4 3 2 1

		5 very representative 4 adequately representative 3 somewhat representative 2 not representative 1 counter representative
Arkansas		
A		5 4 3 2 1
B		5 4 3 2 1
C		5 4 3 2 1
D		5 4 3 2 1

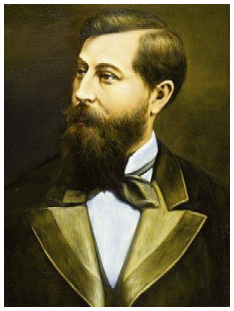
APPENDIX H

PHOTO THUMBNAILS

ART Treatment

 *Dr. Coppelia*
http://www.ballet.co.uk/albums/jr_rb_coppelia_1006/jr_rb_coppelia_heydon_500.jpg

 *Act II real-life Swanilda*
http://www.balett.dancemelody.com/coppelia/coppelia.jpg

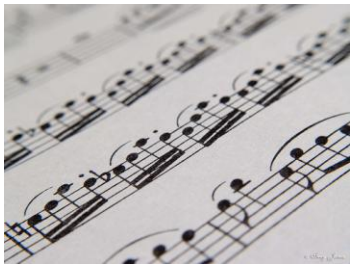
 *Composer Delibes*
http://www.festivaldeubeda.com/portal/images/festival2007/03_Delibes.jpg

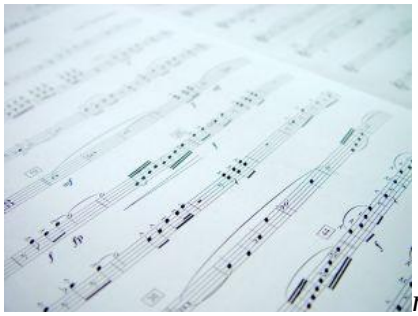
Conductor Kaplow
http://www.celebritywonder.com/thumb/Lawrence_Kaplow/LawrenceKapl_Granitz_7284696.jpg

Coppelia opera
http://www.galleryballet.com/images/Coppelia%20large.jpg


Coppelia three-act ballet

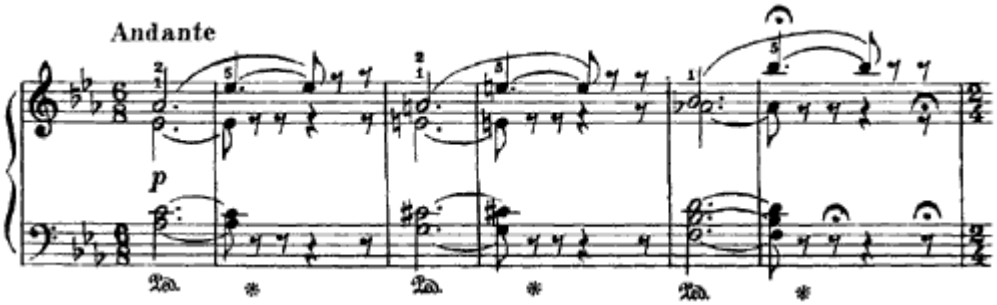
http://www.saratogaspastatepark.org/images/Coppelia-%20Borree1.jpg


music score

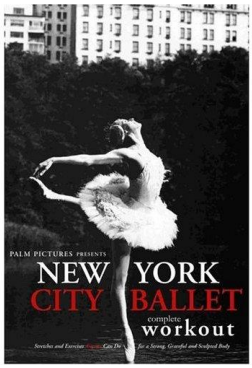

music score

http://www.trinityrichmond.net/files/My%20Sample%20Gallery/Musical%20Score.jpg


music score
http://www.k9stitches.com/musical%20score.jpg



http://en.wikipedia.org/wiki/L%C3%A9o_Delibes



New York City Ballet
http://g-ec2.images-amazon.com/images/I/5132J31V4ZL._SS500_.jpg

Wednesday

http://i281.photobucket.com/albums/kk205/dazj3/greetings/wednesday/wednesday_1.gif

Politics Treatment

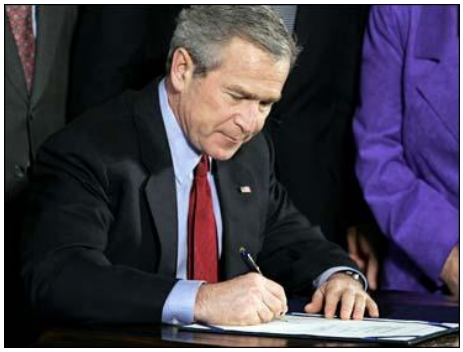
House of Representatives
http://www.cyberlearning-world.com/lessons/house_large_seal.gif

Senate
http://samhblum.com/wp-content/uploads/logos/senate.png

Congress
http://htschoemmortgage.com/florida_mortgage/wp-content/uploads/2008/05/us-congress.jpg

Bailout Bill
http://s.wsj.net/media/gavelmoney_C_20081210165526.jpg

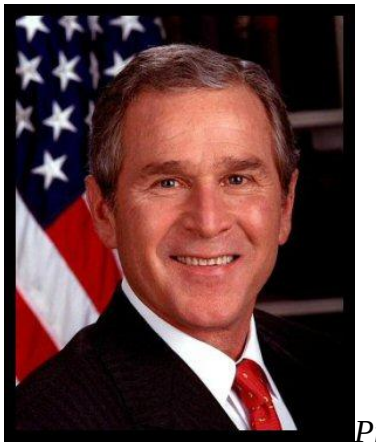
$700 billion measure
http://www.marketoracle.co.uk/Article6588.html


Bush signs bill
http://www.cbsnews.com/stories/2005/02/11/politics/main673159.shtml

Wall Street
http://www.currentbusinessnews.net/michael-moores-thoughts-on-the-700-billion-bailout-proposal/


crisis in communities
http://images.google.com/imgres?imgurl=http://www.investrightgroup.com/money%2520house.jpg&imgrefurl=http://www.investrightgroup.com/&usg=__oWkvUe8-Qg0PG3kZ5806OIZhePQ=&h=380&w=380&sz=159&hl=en&start=3&tbnid=6bxN_OcZm6nZ8M:&tbnh=123&tbnw=123&prev=/images%3Fq%3Dhouse%2Bof%2Bmoney%26hl%3Den%26sa%3DG


Crisis in communities
http://www.dudehisattva.com/bush%20burn%20dollar2.jpg


President Bush
http://www.bbspot.com/Images/News_Features/2005/01/bush.jpg


Money crisis

http://images.google.com/imgres?imgurl=http://toplinksolutions.com/images/bag%2520of%2520money.jpg&imgrefurl=http://richardstheone.blogspot.com/&usg=__5qSJJg2vdaIqWWrGBTOeNaJKpO0=&h=383&w=269&sz=23&hl=en&start=121&tbnid=O6bxYM9jlTiRnM:&tbnh=123&tbnw=86&prev=/images%3Fq%3Dmoney%2Bcrisis%26start%3D120%26ndsp%3D20%26hl%3Den%26sa%3DN

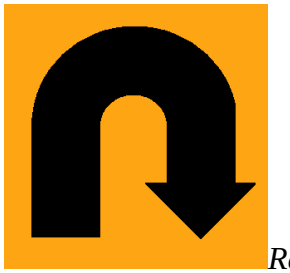
http://www.mycreditcrisisblog.com/2008/07/technorati.html


Money crisis
http://midnightraider.typepad.com/photos/uncategorized/2007/10/26/money.jpg

http://geography.about.com/library/blank/usa3.jpg


Washington D.C.
http://traveldk.com/dkimages/0-washington-dc_master.jpg

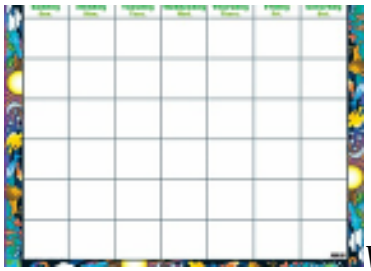
Within days
http://www.fairgotrading.com.au/images/7pkt_days_of_week_web.jpg



Reverse direction
http://upload.wikimedia.org/wikipedia/commons/e/e5/Aranho_U-turn_icon.png

Communities
http://www.e-agriculture.org/fileadmin/_temp_/forum.jpg

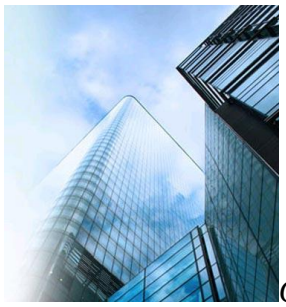
ARKANSAS Commissioners Treatment

 *Within month*

http://bksschoolhouse.com/cart-imgs/prod15574_lg.jpg


Thursday

http://i59.photobucket.com/albums/g285/Mumsyof3/happy_thursday_music_rose.jpg

 *Consulting firm*

http://www.sachsconsulting.com/images/company_building3.jpg

 *Research reports*

http://nramedia.com/images/report.jpg


Annual budget

http://villageofarcade.org/assets/images/Budgets_balloon.gif

APPENDIX I

Proctor Instructions

Proctor Instructions

The researcher will cover the following information and instructions with every proctor (faculty or administrator) who may assist in administering study, specifically ***Summary Writing Tutorials: Booklets A*** (control treatment-underlining/circling text).

1. The proctor's role is very important. Provide an overview of the study.

2. After receiving the signed consent forms, I will randomly assign students to separate pre-determined rooms.

3. As soon as students seated in your room, the proctor should explain his/her role.

   Students are participating in a timed experiment, so the proctor ensures the timeframes for each section are adhered to and distractions are minimal. Proctor may answer relevant questions and is responsible for supervising a successful process.

4. Make sure each student has a pencil or pen. Ask students to turn off cell phones. No laptops or other reading/writing materials are allowed.

5. Distribute the booklets. Ask them to open to the first page only. Emphasize that the process will be strictly timed. Inform them it is their responsibility to "Stop…and not turn the page" when they read these printed instructions, and it is the proctor's responsibility to "instruct them to turn the page." Let them know the proctor will track time manually and record it in the **chart** below.

   Proctor will make periodic "warning time" announcements ("time will be up in __ minutes"). Emphasize that the experiment was piloted by students, the times are reasonable, but they will need to focus, carefully read, and follow instructions exactly to gain the most from the experience. Advise students that if they finish before time is up, they should sit quietly and wait to be told to turn the page (it's okay to close your eyes!). Conversely, if students run out of time when the proctor says "time up," they should stop immediately and write "stop" in their booklet.

Chart

Section	Contents	Start time	Minutes	Finish Time
-	Introduction	_____	2	_____
1	Summarization: pre-test	_____	10	_____
2	Instructions	_____	12	_____
3	Summary: Politics	_____	25	_____
-	BREAK	_____	3	_____
4	Summary: Ballet	_____	25	_____
5	Summarization: post-test	_____	8	_____
6	Satisfaction survey	_____	5	_____
			90 total minutes	

6. Additional section notes for proctor:

- Introduction. Proctor should read the introduction page aloud. Quickly summarize the section by section contents area rather than read every word. Make sure all students have entered their seven-digit code before moving to the next section.

- Summarization: pre-test. If it is clearly obvious that EVERYONE has completed this section and they are finished checking their answers, you may ask if it is okay to move to the next section. Do not move ahead of the allotted time unless you are certain all students have agreed to do so.

- Instructions. Proctor should read items 1, 2, and 3 on the first page, including the "commissioners" paragraph. At the bottom of page it says "do not turn page" until instructed. Tell students this is to ensure that everyone spends enough time closely rereading the paragraph. Allow everyone an additional 4-5 minutes to reread the paragraph silently.

  After instructing students to turn the page, read item 4, including the summary. Ask if there are questions after reading the summary. Mention that "47 words = 33%" indicates the summary length compared to the original text.

- Summary: Politics. Students will work individually from this section forward. The proctor should not read any text aloud from the booklet. Remind students that neatness is important because their writing will be transcribed for assessment.

  If students ask you if it's okay to rewrite their summary in *step two*, say, "That's okay. Write it in the blank page opposite step two but be aware that time may expire before you're done."

  This is a good section for the proctor to make "time warning" announcements (e.g., "three minutes to go" and "one minute to go").

- Summary: Ballet. Same instructions as *Summary: Politics*.

- Summarization: post-test. Same as pretest instructions.

- Satisfaction Survey. Encourage students to take their time but try to answer the final question for their written feedback.

- Please collect all booklets when time has expired (1 hour, 30 minutes) and give them to the researcher.

THANK YOU SO MUCH FOR HELPING THE RESEARCHER!
YOUR ROLE IS CRITICAL IN MAKING THIS A SUCCESS!

APPENDIX J

Grading Rubric for Summaries: Individual Raters' Scores

Grading Rubric for Summaries: Individual Raters' Scores

Student summary	Independent Rater #1	Independent Rater #2	Ricky Rater #3	Same Scores ALL	Different Scores ALL	Same Scores I &III	Different Scores I &III
POLITICS							
1- JOH9541							
I. Main Ideas	**3**	**3**	**3**	**x**		**X**	
II. Accurate	4	4	4	x			
III. Words & Style	**3**	**2**	**2**		x		**X**
IV. Concisely Organized	4	4	4	x			
V. Length	3	3	3	x			
Total Score	17	16	16				
2- NEL9411							
I. Main Ideas	**2**	**2**	**2**	**x**		**X**	
II. Accurate	3	3	3	x			
III. Words & Style	**3**	**3**	**3**	**x**		**X**	
IV. Concisely Organized	3	3	3	x			
V. Length	3	3	3	x			
Total Score	14	14	14				
3- BNA4831							
I. Main Ideas	**2**	**2**	**2**	**x**		**X**	
II. Accurate	2	2	2	x			
III. Words & Style	**2**	**2**	**2**	**x**		**X**	
IV. Concisely Organized	3	2	2		x		
V. Length	4	4	4	x			
Total Score	13	12	12				
4- HAM4830							
I. Main Ideas	**2**	**2**	**2**	**x**		**X**	
II. Accurate	3	3	3	x			
III. Words & Style	**3**	**3**	**3**	**x**		**X**	
IV. Concisely Organized	2	3	3		x		
V. Length	3	3	3	x			
Total Score	13	14	14				
5- PON4486							
I. Main Ideas	**2**	**2**	**2**	**x**		**X**	
II. Accurate	2	2	2	x			
III. Words & Style	**4**	**4**	**4**	**x**		**X**	
IV. Concisely Organized	3	4	3		x		
V. Length	4	4	4	x			
Total Score	15	16	15				
SUBTOTAL POLITICS				21 (25)	4 (25)	9 (10)	1 (10)
AGREE %				84%	16%	90%	10%

Student summary	Independent Rater #1	Independent Rater #2	Ricky Rater #3	Same Scores ALL	Different Scores ALL	Same Scores I &III	Different Scores I &III
BALLET							
1- JOH9541							
I. Main Ideas	**1**	**1**	**1**	**x**		**X**	
II. Accurate	2	3	2		x		
III. Words & Style	**2**	**2**	**2**	**x**		**X**	
IV. Concisely Organized	3	3	3	x			
V. Length	1	1	1	x			
Total Score	9	10	9				
2 - NEL9411							
I. Main Ideas	**3**	**3**	**3**	**x**		**X**	
II. Accurate	3	3	3	x			
III. Words & Style	**3**	**3**	**3**	**x**		**X**	
IV. Concisely Organized	4	3	3		x		
V. Length	3	3	3	x			
Total Score	16	15	15				
3- BNA4831							
I. Main Ideas	**1**	**1**	**1**	**x**		**X**	
II. Accurate	1	1	1	x			
III. Words & Style	**1**	**1**	**1**	**x**		**X**	
IV. Concisely Organized	3	2	3		x		
V. Length	2	2	2	x			
Total Score	8	7	8				
4- HAM4830							
I. Main Ideas	**2**	**2**	**2**	**x**		**X**	
II. Accurate	3	3	3	x			
III. Words & Style	**2**	**3**	**3**		**x**		**X**
IV. Concisely Organized	2	2	2	x			
V. Length	3	3	3	x			
Total Score	12	13	13				
5- PON4486							
I. Main Ideas	**3**	**3**	**3**	**x**		**X**	
II. Accurate	4	4	4	x			
III. Words & Style	**3**	**4**	**3**		**x**		**X**
IV. Concisely Organized	3	3	4		x		
V. Length	4	4	4	x			
Total Score	17	18	18				
SUBTOTAL BALLET				19 (25)	6 (25)	8 (10)	2 (10)
AGREE %				76%	24%	80%	20%
GRAND TOTAL ALL				40 (50)	10 (50)	17 (20)	3 (20)
AGREE TOTAL %				80%	20%	85%	15%

Independent Rater #1 Scores for 10 Sample Summaries

Original Text: Politics						
Student	I. Main Ideas	II. Accurate	III. Words & Style	IV. Concisely Organized	V. Length	Total Score
1- JOH9541	3	4	3	4	3	17
2- NEL9411	2	3	3	3	3	14
3- BNA4831	2	2	2	3	4	13
4- HAM4830	2	3	3	2	3	13
5- PON4486	2	2	4	3	4	15
Original Text: Ballet						
Student	I. Main Ideas	II. Accurate	III. Words & Style	IV. Concisely Organized	V. Length	Total Score
1- JOH9541	1	2	2	3	1	9
2 - NEL9411	3	3	3	4	3	16
3- BNA4831	1	1	1	3	2	8
4- HAM4830	2	3	2	2	3	12
5- PON4486	3	4	3	3	4	17

Rater's Name: Michelle E. Smith, M.A. Ed.
Title: Senior Academic Advisor
Institution: Brandman University
Degree: Master of Arts in Education
Teaching or Administrative Experience in Higher Education (position-years): 12 years of university enrollment, teaching, and academic advising experience

Independent Rate #2 Scores for 10 Sample Summaries

Original Text: Politics						
Student	I. Main Ideas	II. Accurate	III. Words & Style	IV. Concisely Organized	V. Length	Total Score
1- JOH9541	3	4	2	4	3	16
2- NEL9411	2	3	3	3	3	14
3- BNA4831	2	2	2	2	4	12
4- HAM4830	2	3	3	3	3	14
5- PON4486	2	2	4	4	4	16
Original Text: Ballet						
Student	I. Main Ideas	II. Accurate	III. Words & Style	IV. Concisely Organized	V. Length	Total Score
1- JOH9541	1	3	2	3	1	10
2 - NEL9411	3	3	3	3	3	15
3- BNA4831	1	1	1	2	2	7
4- HAM4830	2	3	3	2	2	13
5- PON4486	3	4	4	3	4	18

Rater's Name: Michael Hill
Title: Site Director, Adjunct Professor
Institution: Brandman University, Chapman University System
Degree: M.P.A., M.A.Ed. (expected 2011)
Teaching or Administrative Experience in Higher Education (position-years): Brandman University, Chapman University System - 2.5 Years; American River College, Adjunct Professor, 1 Year.

Independent Rater #3 Scores for 10 Sample Summaries

Original Text: Politics						
Student	I. Main Ideas	II. Accurate	III. Words & Style	IV. Concisely Organized	V. Length	Total Score
1- JOH9541	3	4	2	4	3	16
2- NEL9411	2	3	3	3	3	14
3- BNA4831	2	2	2	2	4	12
4- HAM4830	2	3	3	3	3	14
5- PON4486	2	2	4	3	4	15
Original Text: Ballet						
Student	I. Main Ideas	II. Accurate	III. Words & Style	IV. Concisely Organized	V. Length	Total Score
1- JOH9541	1	2	2	3	1	9
2 - NEL9411	3	3	3	3	3	15
3- BNA4831	1	1	1	3	2	8
4- HAM4830	2	3	3	2	3	13
5- PON4486	3	4	3	4	4	18

Rater's Name: Ricky DeSoiza
Institution: University of San Francisco
Degree: Ed. D. candidate

APPENDIX K

SATISFACTION SURVEY: COMMENTS

Satisfaction Survey: Comments
Thematic Categories from Underline (UL) and Pictorial Map (PM) Groups

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Survey Statement: "Your comments are appreciated in the space below."

First Research Question on Format Condition

1. I thought the bubbles made it so much easier to write a summary. Having less words, but important facts was what made it easier to write summaries better and also not take up too much time.(pm)
2. The pictures/mind mapping was a helpful concept.(pm)
3. While the picture map helped to pick out the main points, it made organizing sentences difficult.(pm)
4. Very good example of summarizing technique by using visual fill-ins.(pm)
5. The pictures were not helpful to me. I preferred to circle key words on the original text.(pm)
6. The pictorial map was helpful, but my summaries come together better when I was allowed to see the original passage.(pm)
7. Maybe next time more writing and not so much circling.(ul)

Second Research Question on Content Condition

1. I didn't understand the point in the second paragraph.(ul)
2. I disliked the paragraph about Dr. Coppelia.(ul)
3. I did not like the second passage to summarize.(ul)
4. Ballet summary was the hardest because it had a lot of description. It was about solo description…Facts are easier to summarize for me.(ul)

5. The summary writing was a bit difficult in certain areas, especially in "Coppelia" but it helped me to learn how to summarize better and to understand the length it should be.(ul)
6. I thought the ballet one was a little bit confusing but overall I still learned something.(pm)
7. On ballet paragraph I suggest omitting toymaker and act III references at end. For me this made the pictorial outline confusing during transition to first and second draft summaries.(pm)
8. I few more minutes on ballet would increase comprehension. (pm)
9. I have a hard time summarizing something I have not interest in or no background knowledge of. The content was beyond my scope of knowledge because I am neither interested in politics nor in the ballet. I would have done better on a topic of interest.(pm)
10. I did not relate to the topics—but then again I guess that is best way to comprehend what is being said. (pm)
11. I really struggled with understanding the paragraphs, let alone summarizing them.(ul)
12. I found it easier to write a summary as the study progressed; however, the subject also became more convoluted. (pm)
13. It is very difficult to summarize a reading (i.e., ballet) that I do not understand.(pm)
14. The two passages chosen were a great representation of a simple and a more complex passage to summarize. This really helped to exercise the summarizing skill.(pm)

Positive Comments on Tutorial Treatment

1. Helped me to identify I need to learn this material in more depth—especially if I'm going into my masters.(ul)
2. Helped me to identify I need to learn this material in more depth—especially if I'm going into my masters.(ul)
3. Format was easy to follow. I had a better understanding by the end of the process.(ul)
4. This was fun. I think another example on writing a review type summary such as the ballet would have helped me. Overall this was a positive experience.(ul)
5. This very short tutorial had a great deal of helpfulness in writing a summary…I actually did not know how to write one correctly.(ul)
6. This is a good start in learning to write a summary.(ul)
7. Instructions were very clear and enough time given.(ul)
8. Instructions were well written.(ul)
9. The instructions given were clear and concise. I have a better understanding in creating a summary.(pm)
10. This was easy to understand, practical way to learn to summarize.(ul)
11. The exercise was very useful. I appreciated the steps in process that led to the exercise.(ul)
12. The content was well organized and easy to understand.(ul)
13. I found it very informative to learn how to summarize a paragraph this way.(ul)
14. I found it interesting with the summarized example how concise it was compared to my summaries. The example was a good indicator to compare my skills against. Good job.(ul)
15. It was a good tutorial on how to write a summary. Brief, but good.(ul)
16. I liked the technique with first asking questions to get us thinking about the concepts even though I did not know which answers were correct. The middle part is where it explains the technique to use when summarizing. The final section was a repeat of the first, but this time I know what was expected.(ul)
17. This was an interesting and helpful tutorial overall.(ul)
18. This was fun.(pm)
19. Good job. Enjoyed assisting in the research.(pm)
20. The tutorial was effective and easy to follow.(pm)
21. I liked the way the exercise went step by step.(pm)
22. Overall very good summary practice.(pm)
23. The exercise was easy to follow and understand.(pm)
24. Great test. I enjoyed taking it.(pm)
25. All in all the test design was manageable.(pm)
26. This method in teaching students summarization would benefit them when writing essays that include extensive research. Further it would aid in making the essay more interesting to the reader! I am grateful to be a part of what I believe to be essential to learn as part of building a solid foundation for being a great writer.(pm)
27. A tutorial on writing would be extremely helpful given the extent of the research I will need for the public administrator major.(pm)
28. This is a good tool for someone who has not had previous experience with summaries.(pm)
29. This was a nice exercise and refresher.(pm)
30. Nice approach to learning how to summarize.(pm)
31. The whole exercise helped me to learn to summarize.(pm)
32. This was very educational.(pm)
33. I found this tutorial to be helpful.(ul)
34. This was helpful.(pm)

Negative Comments and Improvements Suggested for Tutorial Treatment

1. Only complaint is we didn't go over answers to pretest or posttest.(ul)
2. Not knowing/going over answers to posttest makes room for doubt if I learned correctly or not.(ul)
3. The time allotment was really long.(ul)
4. I don't need as much time as allotted to complete each section.(ul)
5. We do not need as much time.(ul)
6. I could have used more time on step 3. It might be good to increase the time on the first summary by a minute or two.(pm)
7. The first question on the pretest tricked me about the length of the summary.(ul)
8. I could have written better, more concise summaries had there been more time allotted to complete them.(pm)
9. I did not find this process helpful in learning how to write summaries…I would not use this format to learn.(pm)
10. I liked…a pretest…and followed up with the post exam.(ul)
11. It would be more helpful if for one of the paragraphs…we received feedback from instructor.(ul)
12. I would have liked to have an example for reference.(ul)
13. I would have liked more examples to practice with and maybe see the suggested way of how it can be written. I am a visual learner and learn with examples and repetition.(ul)
14. A range of topical paragraphs would be helpful to pick from for reading and summarizing.(pm)
15. Color photos.(pm)

General Participant and Learning Comments

1. I don't think I had enough instruction on summarizing in my college experiences. I would like more guidance on summarizing in future classes.(ul)
2. I found this very challenging. I have never done this before. It was difficult for me. (ul)
3. It is the hardest part for me to write. I could use more work on them.(ul)
4. The English classes…at college…don't focus…on summaries.(ul)
5. I don't believe I was ever taught how to summarize. Thank you for this. I enjoyed the concept.(ul)
6. Summarizing paragraphs should be about 25-33% in length of the original paragraph.(ul)
7. I plan to use these new tools to help me in the future.(ul)
8. I had never been taught in this manner before, and with all the essays we have...it will be a great asset.(ul)
9. Interesting to see the difference in some of my answers from section 1 to 5. I believe this exercise helped my summarizing skills.(ul)
10. Thanks for doing this research. I hope this topic will be included in the next cohort's classes.(ul)
11. I learned how to summarize in essentially three steps. By section four I was reinforcing/applying knowledge.(ul)
12. It was a good exercise which got me to think extra hard to help me write a better summary.(ul)
13. For me writing is something I need time to group my thoughts and brainstorm. I'm not someone to just put something down without thinking it through. Sorry I didn't complete the assignment as well as I could.(pm)

14. This strategy for summary should be taught and given more focus so that students can think more about the contents of curriculum rather than just reading assignments.(pm)
15. What I learned is that I need to practice summarizing articles to make them more succinct and better use my own words. “Less is more.”(pm)

Note: For formatting purposes, some responses were condensed slightly by deleting unnecessary words such as *the, a/an, that, which.* When responses covered more than one research question or theme, they were divided and placed in separate categories for accurate analysis.

APPENDIX L

Permission Letter to Administer Tutorial: University of San Francisco

Permission Letter to Administer Tutorial: Brandman University

UNIVERSITY of SAN FRANCISCO

December 15, 2010

Institutional Review Board for the Protection of Human Subjects
University of San Francisco
2130 Fulton Street
San Francisco, CA 94117

Dear Members of the Committee:

On behalf of the USF School of Business and Professional Studies, I am writing to formally indicate our awareness of the research proposed by Mr. Ricky DeSoiza, a student at USF.

We are aware that Mr. DeSoiza intends to conduct his research by administering a tutorial on how to write a summary to our students. I am responsible for the Writing Program faculty.

I give Mr. DeSoiza permission to conduct his research on our regional campuses. If you have any questions or concerns, please feel free to contact my office at (415) 422 2126.

Sincerely,

Philip Hanson

Philip Hanson, Ph.D.
Associate Professor, Interdisciplinary Studies
Director, Writing Program
School of Business and Professional Studies
University of San Francisco

BRANDMAN University Chapman University System

SCHOOL OF ARTS & SCIENCES

December 15, 2010

Institutional Review Board for the Protection of Human Subjects
University of San Francisco
2130 Fulton Street
San Francisco, CA 94117

Dear Members of the Committee:

On behalf of Brandman University, I am writing to formally indicate our awareness of the research proposed by Mr. Ricky DeSoiza, a student at USF.

We are aware that Mr. DeSoiza intends to conduct his research by administering a tutorial on how to write a summary to our students. I am responsible for student and faculty affairs in the College of Arts and Sciences of Brandman University.

I give Mr. DeSoiza permission to conduct his research on our regional campuses at Travis AFB and Folsom. If you have any questions or concerns, please feel free to contact my office at (949) 341.9831.

Sincerely,

Pamela J. Monaco, Ph.D
Dean of Arts and Sciences
Brandman University
16355 Laguna Canyon Road
Irvine, CA 92618-3801

APPENDIX M

Informed Consent Form

INFORMED CONSENT FORM
UNIVERSITY OF SAN FRANCISCO

CONSENT TO BE A RESEARCH PARTICIPANT

Purpose and Background

Mr. Ricky DeSoiza, a graduate student in the School of Education at the University of San Francisco, is doing a study on how to write a summary of a text passage. Research indicates that college students may be confused about the standards and expectations for writing an acceptable summary. This researcher is interested in exploring different strategies in an instructional tutorial on how to write an acceptable summary. I am being asked to participate because I am a college student over the age of 18.

Procedures

If I agree to participate in this study, I will receive from me a booklet in which I will (1) answer some questions about summarization, (2) write two summaries, and (3) take a short satisfaction survey.

Risks of Participation

There are no known risks to participating in this study.

Benefits

The anticipated benefit of this study is a better understanding of how to write a summary of a source passage.

Costs/Financial Considerations

There are no financial costs to me as a result of taking part in this study.

Questions

I have talked with Mr. DeSoiza or his research assistant about this study and have had my questions answered. If I have further questions about the study, I may call him at 916-337-6880.

If I have any questions or comments about participation in this study, I should first talk with the researcher. If for some reason I do not wish to do this, I may contact the IRBPHS, which is concerned with protection of volunteers in research projects. I may reach the IRBPHS office by calling (415) 422-6091 and leaving a voicemail message, by e-mailing IRBPHS@usfca.edu, or by writing to the IRBPHS, Department of Psychology, University of San Francisco, 2130 Fulton Street, San Francisco, CA 94117-1080.

Confidentiality

I understand that the researcher will keep my identity and information confidential and share it only with people who have agreed to keep it confidential, such as his faculty advisor. All data will be protected in a file that only the researcher can access. Paper copies will be secured in a locked cabinet at the researcher's home, kept until the end of the study, and then erased.

Consent

I have been given a copy of the "Research Subject's Bill of Rights" and I have been given a copy of this consent to keep. PARTICIPATION IN RESEARCH IS VOLUNTARY. I am free to decline to be in this study, or to withdraw from it at any point. My decision as to whether or not to participate in this study will have no influence on my present or future status as a student. My signature below indicates that I agree to participate in this study.

_____

Participant's Signature Date of Signature

_____

Signature of Person Obtaining Consent Date of Signature