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COMPARING THE EFFECTS OF LEARNING THE STRUCTURE STRATEGY VIA
WEB-BASED TRAINING OR CLASSROOM TRAINING ON THE RECALL OF
NEAR AND FAR TRANSFER TEXTS.

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by

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ABSTRACT

The study examined the effects of two methods for training college students in a reading strategy: web-based and traditional/classroom training. Participants were randomly assigned to three conditions. Participants in the first condition received traditional/classroom training on using the problem/solution structure when reading and recalling information. Participants in the second condition received web-based training on using the problem/solution structure. Participants in the third condition were not trained on using the problem/solution structure. Then, all participants read and recalled two passages (near and far transfer tasks). Participants trained to use the problem/solution structure were expected to outperform those not trained on the near and far transfer tasks. Participants in the web-based condition were expected to have significantly better use of the top-level structure, total recall, and recall of main ideas than participants in the traditional/classroom training condition on the far transfer passage but not on the near transfer passage, to perform better on the training exercises and to have more positive attitudes toward training than participants in the traditional/classroom training condition. The data supported the first hypothesis in that participants taught to use the problem/solution structure performed significantly better on the use of the top-level structure measure. The hypothesis that participants in the web-based condition would perform better on the dependent measures on the far transfer but not on the near transfer passage was not supported by the data. The hypothesis that participants in the web-based condition would outperform those in the traditional/classroom condition on the training exercises was not supported. The hypothesis that participants in the web-based condition would have more positive attitudes was partially supported.

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CHAPTER 1

INTRODUCTION

The creation of flexible knowledge structures is crucial in our information age. The increasing amount of knowledge challenges performance on everyday and classroom cognitive tasks. Thus, it is necessary to promote the acquisition and use of flexible knowledge structures in order to enhance learners' acquisition and application of knowledge in a variety of contexts and domains.

One way to promote flexible knowledge is to teach knowledge that could transfer across tasks and domains. Transfer involves noticing the resemblance across cognitive tasks and creating connections between background and new information, thus resulting in meaningful, flexible knowledge (Salomon & Perkins, 1989). However, transfer is an effortful process. Catrambone and Holyoak (1989) and Theodorou (2000) demonstrated the difficulty of transfer with problem solving transfer tasks. It is therefore critical that educators realize that learners may have difficulty transferring under particular circumstances. Investigating factors influencing transfer, such as learners' characteristics, strategies, and materials, can provide educators and researchers with better insights on how to promote transfer.

The rate of generating new information has increased rapidly in the last fifty years. As a result, the cognitive demands on humans have increased in addition to the increased demands in the skills required to perform well not only in academic settings but also in the workforce. How then would transfer be promoted? One way to meet the increasing requirements of our information age and to promote transfer is using computers as a teaching aid. Implementing new instructional methods and using

technology to enhance learning could become a valuable tool for promoting transfer and the flexible use of knowledge. According to Griffin (1995), Hsu (1997), Lave and Wenger (1993) computer-based instruction can provide learners with more authentic, situated learning tasks that enable them to actively engage in their learning process. Technology can be a valuable tool in assisting learners to transfer information across tasks and domains, promoting the development of flexible schemata thus facilitating learning and problem solving (Hsu, 1997). Therefore, the effects of computer-aided instruction on problem solving and transfer need to be investigated in depth. Winn (1993) proposed that one of the purposes of instruction is to teach general skills students can transfer to a variety of situations, but also to teach knowledge pertaining to the particular task or domain. Additionally, Winn proposed that it is essential to train students to make inferences and to monitor their performance, as well as teach learners when and where it would be appropriate to transfer or use what they have previously learned. Computers can function as a dynamic tool to scaffold students through the process of acquiring knowledge on a situated, domain-specific environment, and through decontextualizing that information to form generic, flexible schemata that can be transferable to a variety of situations (Greenfield, Brannon, & Lohr, 1996; Taylor, Lintern, Julin, Talleur, Emanuel, & Philips, 1999; Yamamoto & Miya, 1999).

A number of studies examined transfer of skills taught with the use of computers (Fix & Wiedenbeck, 1996; Taylor et al., 1999; Yamamoto & Miya, 1999). Overall, these studies have provided evidence that skills taught with the use of computers do transfer, but cases of failure to transfer have been reported (Fix & Wiedenbeck, 1996). Computer tools that provide conditional and procedural knowledge can be used to promote transfer

and to prevent failure to transfer. Even though computer programs might support learning and transfer, more information is needed about their interaction with human learners.

The present study examined the effects of two methods for training college students in a reading strategy: web-based training and traditional/classroom training. Computer-based training refers to a training system in which a computer takes the role of the instructor. Computer-based training allows the learners to proceed at their own paces and to control their own learning experience. Web-based training is one type of computer-based training. Web-based training varies depending on its purpose and the characteristics of the learners. The advantages of web-based training include easy access and reduced travel expenses, the ability to use one's own computer, reduced cost for print materials, quick access at any time, access to revisions and up-to-date information, access of schematic drawings, reference manuals, databases, and technical experts on-line (Dyck & Mayer, 1989). With such advantages it is important to know whether learners in a web-based setting obtain as much understanding from their instruction as learners in the traditional classroom setting. The present study investigated this issue by comparing web-based instruction and traditional classroom instruction focused on teaching the structure strategy (Mayer, 1999; Meyer, 1975; Meyer, Brandt, & Bluth, 1980; Meyer, Young, & Bartlett, 1989). In addition this study investigated the effects of training learners in the use of this reading strategy on transfer to reading and recalling new passages.

This investigation examined whether participants taught to use the problem/solution structure transferred and used that structure to read and recall a near transfer passage and a far transfer passage. Near transfer refers to transferring information within the same domain by recognizing the similarity in the surface features

of two tasks. The existence of such surface similarities leads to the realization that the underlying structure is also the same. Far transfer refers to transferring information across domains that do not share the same surface features. In this case the learner needs to recognize the similarity in the underlying structure of two tasks without relying on surface similarities (e.g., Echevarria, 1995; Pressley & McCormick, 1995; Thorndyke, 1977).

In the present study a near transfer and a far transfer task were implemented. The near transfer task (medical problem of schizophrenia) had a similar topic (health-related topic) as well as the same structure as the training passages and reading materials. The far transfer task (either energy generation or vehicle for distribution wealth at death) shared the same underlying structure (problem/solution) as the training materials, but its topic shared no surface/topic similarity to the training passages (health topics).

This research was intended to explore whether web-based training with the structure strategy (Meyer et al. 1989; Meyer, 1975; 1985) can act as a learning tool, by investigating the effectiveness of web-based compared to traditional/classroom training on participants' transfer of the structure strategy and consequently on their recall of text information. Specifically, the study investigated the effects of two learning conditions (web-based training and traditional/classroom training) on college students' transfer of the structure strategy and on their recall performances.

The following research questions were generated:

1. Will web-based instruction about the problem/solution reading structure result in better performance than traditional/classroom instruction about this structure on total recall, recall of main ideas, and use of the problem/solution

structure to organize the recall of text information from near and far transfer tasks?

2. Will the type of training (traditional/classroom and web-based training) interact with transfer task (near and far transfer task)?
3. Will type of training (web-based and traditional/classroom training) influence performance on the training exercises and materials?
4. Will type of training (web-based and traditional/classroom training) influence participants' attitudes toward training?

CHAPTER 2

LITERATURE REVIEW

Web-based instruction, instruction about reading and text structure, and transfer are the foundational constructs in this research. The effect of web-based instruction on transfer of a strategy to identify and use text structure is the phenomenon investigated in this research. Therefore, in this section, the researcher will first review the theoretical and empirical evidences of instruction about reading and text structure as well as provide a brief overview about learner, text, and task variables that influence learning from text. Then, the researcher will report studies on transfer and the role of prior knowledge on transfer. After that there is a discussion on the research of instruction delivered by computers, which is followed by a discussion of the theoretical foundations of learning that need to be incorporated into computer training and a brief discussion on self-paced instruction.

Instruction about Reading and Text Structure

Text Structure

The structure of texts is an area of great interest in learning and instruction. In this section research regarding text structure and how it can facilitate understanding, learning, and remembering text information will be discussed.

Meyer (1975, 1985) proposed that authors organize ideas in text using specific structures and such organization influences learners' understanding and recall of text information. Meyer identified three levels of prose analysis. The micropropositional level

is the way ideas are organized in sentences as well as the way sentences are organized in the text. The macropropositional level refers to the logical organization of the passage. The top-level structure is the overall structure of a passage. Ideas are organized in a hierarchical manner with the most important or main ideas located high in the structure, while less important ideas or details are located low in the structure. The relationships among ideas in a passage determine the overall structure of the passage. Training learners to identify and use the overall structure of texts has increased the amount of information remembered (e.g., Meyer et al., 1989, Meyer & Poon, 2001).

Meyer (1975, 1985) identified five common structures authors use to organize text ideas. These are problem/solution, cause/effect, comparison, description, and sequence. Problem/solution involves a problem and a solution that responds to the problem or a question and its responsive answer. Cause/effect shows a causal relationship, involving a cause and an effect. Comparison involves comparing two or more things/ideas and determining how they are similar and/or different. Description provides characteristics or attributes about a specific topic. Sequence shows the order of occurrence for events or the order of steps to perform a task. Cook and Mayer (1988) and Gordon (1990) proposed similar categorizations of text structures; they proposed the following structures: generalization, enumeration, sequence, compare/contrast, and cause/effect.

The problem/solution structure was selected for training in the present study because of its importance and use in college and everyday life. The problem/solution structure is widely used in scientific journals, research reports in magazines, and medical information. College students are very likely to have to study and remember information

from such texts. Therefore, it is important to train students in identifying and correctly using this particular structure when reading and studying.

Training learners to effectively use reading strategies to improve their reading comprehension is crucial. Being able to efficiently organize and remember information one has read is important in educational settings, professional development, and even maintaining one's independence with increasing age (Meyer, Talbot, Poon, & Johnson, 2001). Cook and Mayer (1988) argued that expository text has an underlying, top-level structure and that readers' failure to comprehend and to retain text information may result from their lack of awareness of this top-level structure. Learners' lack of awareness of text structure can influence the types of processing strategies they choose (Loman & Mayer, 1983). Students aware of text structure are more likely to use a meaningful reading strategy and to focus on conceptual information, while learners who lack awareness of text structure tend to use a default, list strategy (Loman & Mayer, 1983; Meyer et al., 1980; Meyer, et al., 1989). Thorndyke (1977) and Thorndyke and Hayes-Roth (1979) argued that knowledge of text structure can be used to guide students' encoding of facts. Text structure can be effectively used by readers to facilitate their processing, understanding, and recall of information they encounter in texts (Meyer et al., 1980; 1989; Cook & Mayer, 1988).

Training learners in the structure strategy (Meyer, 1982; Meyer, 1985; Meyer et al., 1980; 1989; Meyer & Poon, 2001; Meyer & Rice, 1983) involves teaching how to detect and how to utilize the structure the author used to organize ideas in a passage to facilitate one's reading comprehension and recall. The role of the structure strategy in reading comprehension and recall has been examined in a number of research studies

(Bartlett, 1978; Cook & Mayer, 1988; Gordon, 1990; Kardash & Noel, 2000; Loman & Mayer, 1983; Lorch & Lorch, 1995; Lorch & Lorch, 1985; Lorch, Lorch, & Inman, 1993; Meyer et al., 1980, 1989, 2002; Meyer & Poon, 2001; Meyer & Wijekumar, in press; Sagerman & Mayer, 1987; Samuels, Tennyson, Sax, Mulcahy, Schermer, & Hajovy, 1988; Slater, Graves, & Piche, 1985; Williams, Hall, Kristen, Stafford, DeSisto, & DeCani, 2006). The results of these studies have indicated that utilizing the structure of expository text improves reading comprehension and recall of ideas from text.

Learner, Text, and Task Variables

Meyer and her colleagues (Meyer & Rice, 1983; Meyer et al., 1989) have identified learner, text, and task variables as three groups of factors influencing reading comprehension. Learner (e.g., background knowledge, learning strategies, individual differences in reading speed, attention when reading) and text variables (e.g., signaling, text structure, font size, color, and type) are important in learning from text. A plethora of research studies have addressed issues related to learner and text variables and their importance in acquiring effective skills for reading comprehension (e.g., Britton, Glynn, Meyer, & Penland, 1982; Dee-Lucas & Di Vesta, 1980; Kardash & Noel, 2000; Loman & Mayer, 1983; Lorch & Lorch, 1995; Meyer et al., 1980; 1989; 1998; Rickards, Fajen, Sullivan, & Gillespie, 1997; Sagerman & Mayer, 1987).

Task variables, such as the pace of presenting information or the way information is presented (e.g., printed materials, web-based materials, time pressure) also can influence individuals' ability to learn and recall information from text. Meyer, Talbot, and Florencio (1998) found that when reading passages at a slower pace (90 words per minute) younger and older adults showed better recall of information than at a faster pace

(130 words per minute). Meyer and Poon (1997) found that presenting information on computers enabled young individuals to learn more efficiently, while presenting older adults with information on computers impeded their performance. One possible reason for these results is that older individuals may have been less familiar with reading information from a computer monitor. Additionally it is possible that text variables such as font size and type, or other factors such as monitor brightness, may have impeded older adults' performance.

The task variable of web-based versus classroom instruction in the structure strategy was investigated in the present study. The role of web-based training on the acquisition and use of reading comprehension strategies is a relatively new issue. The use of computers in teaching reading " is an important and essentially unexplored field" (National Reading Panel, 2000, p. 23). Recently in the current decade research and development has begun in the area of computerized reading instruction (e.g., McNamara, in press, Meyer & Wijekumar, in press), but comparisons have not been made between such computerized instruction and traditional/classroom delivery of the same instruction. Therefore, it is important to examine learning of the problem-solution structure from web-based materials as opposed to learning it in a traditional/classroom setting.

Transfer

Transfer is particularly important in reading comprehension. Reading is one of the most common and one of the most important ways individuals acquire knowledge. Learners' ability to transfer a reading strategy would improve the way they organize and store information in memory, the way they connect new information with prior knowledge, the way they interpret knowledge, as well as their ability to remember what

they read. A number of research studies have investigated transfer of reading strategies (Loman & Mayer, 1983; Meyer & Poon, 2001; Meyer, Rice, Bartlett, & Woods, 1979; Rickards et al., 1997; Theodorou, 2000; Thorndyke, 1977). These studies provided evidence supporting the hypothesis that once trained to use the structure of passages to facilitate reading comprehension, learners transfer that structure to facilitate their reading and recall of novel, structurally similar passages.

This investigation examined transfer of the problem/solution structure (Meyer et al., 1980; 1989) from training to reading and recalling two new passages (a near and a far transfer passage). Most of the training materials (e.g., examples of passages with problem/solution structure and practice passages) were about mental health and nearly all of the training materials fall under the general topic of health. The near transfer passage dealt with one mental health problem (Schizophrenia). This passage not only shared the same structure as the training materials (problem/solution), but also was about a topic similar to the ones participants read during training. On the other hand, the far transfer passage (Trusts passage or Fast Breeder Reactors passage) was organized with the same structure as the training materials (problem/solution) but was about a topic not relevant to mental health.

Transfer refers to one's ability to notice and utilize corresponding information from a familiar domain to a novel, unfamiliar one (Gick & Holyoak, 1983; Smagorinsky & Smith, 1992). For transfer to occur it is necessary that certain requirements are met. One such requirement is the existence of an acquisition task or domain. Through involvement in such tasks, the learner acquires information about the principles governing the task or the domain. A second element of transfer is the existence of a

novel, target task/domain. It is essential for the novel task to involve the same principles/structure as the acquisition task. Thus, the learner is required to not only notice the underlying structure of the acquisition task, but also needs to attend to the structure of the novel task. Additionally, the learner has to recognize that the two tasks share the same structure, and to map shared elements from the acquisition to the target task. Finally, the learner has to be prepared to apply information learned at the acquisition phase to facilitate performance on the target task. According to Salomon and Perkins (1989), different degrees of transfer can occur depending on learners' representations of knowledge, ways they initiate search for background information, and strength of connections between concepts in long-term memory. On the near transfer passage learners in the structure strategy conditions should be able to easily transfer the problem/solution strategy because not only is the passage structure the same on the near transfer passage to the one they learned in training, but also the topic of the passage matches the types of topics used in the training materials.

However, on the far transfer passage, only the passage structure was the same and the content of the text provided no cues to facilitate transfer. Thus, greater mastery of the strategy would be required for the far transfer task. Fifth-grade children with less proficient reading, typing, and computer skills than college students displayed less transfer of the structure strategy on far transfer tasks than near transfer tasks after learning the strategy on-line (Meyer et al., 2002). In the present study the more proficient college readers who learned the strategy on-line were not expected to be hampered on the far transfer task. In fact, compatible with the work of Greenfield et al. (1996), students learning the strategy on-line were expected to be more engaged in learning the strategy

and more proficient on the far transfer task than students learning the strategy in the traditional/classroom condition.

Role of Prior Knowledge in Transfer of Learning

The role of prior knowledge is extremely important in transfer. It is widely accepted that knowledge and understanding are based on previous experience (Blackwell, 2003). Learning is a complex process that involves thinking, memory, perception, and actions of individuals in interaction with the world around them. Learning thus results in understanding and knowledge, which is unique for each person. As a result the design of effective learning environments must address goals for learners that take into account the uniqueness of each individual's learning. One factor that needs to be taken into serious consideration is learners' prior knowledge, conceptual frameworks or schemata. What learners know serves as the basis for future learning. The way learners organize and represent knowledge in long-term memory determines what they pay attention to, how they perceive it, and what they judge as relevant or important. If learners do not form the appropriate conceptual frameworks of the information they are taught, then they are not likely to be successful in transferring that knowledge to solve new tasks in the future (Blackwell, 2003). Transfer is therefore more successful when the original learning occurs in multiple contexts in multiple ways (Mann, 2002). According to Mann, learning becomes context specific and learners must actively work at being able to transfer that learning to new situations. It is therefore crucial for learners to see many examples so that they can compare and store the underlying rules or principles rather than surface information for future use. Additionally, existing knowledge must be organized in a way

that is easily accessible and usable. That is the reason why forming good knowledge representations is so important in transfer.

Catrambone and Holyoak (1989) conducted a series of five studies to investigate the role of schema quality as a predictor of immediate transfer. The five studies by Catrambone and Holyoak shed some light on the complexity of transfer. One of the most important findings from these studies was that comparing or summarizing two analogous base stories facilitated transfer more than comparing an analogous and a disanalogous base story. This finding indicated that comparing two base analogs resulted in enriched schemata and in frequent transfer. However, adding a third base analog did not improve transfer significantly, compared to reading two base stories. Additionally, the results indicated that participants were more likely to transfer after they were given hints regarding the similarity of the base stories and the target problem. Furthermore, an important finding was that questions aimed at focusing participants' attention on the similarities between the base and target tasks facilitated transfer, whereas more general comparison questions did not. Catrambone and Holyoak's research provided evidence that the creation of good schemata or good knowledge frameworks in long-term memory is important for transfer.

Instruction Delivered by Computers

In recent years computers have emerged as an instructional aid and are an increasingly popular means of acquiring knowledge. According to Griffin (1995), Hsu (1997), and Lave and Wenger (1993) computer-based instruction can provide learners with more authentic, situated learning tasks that enable them to actively engage in their learning processes. Additionally, computers can function as a dynamic tool to scaffold

students through the process of acquiring knowledge on a situated, domain-specific environment, and through decontextualizing that information to form generic, flexible schemata that can be transferred to a variety of situations (Hsu, 1997). This is particularly important when a teacher cannot be present or in learning outside the classroom settings. In an environment where learners are required to work on their own to acquire new knowledge computers can provide feedback, detect learners' prior knowledge, adjust the teaching materials to the learner's prior knowledge. Additionally, computers can guide learners in their learning through the implementation of step-by-step instruction (Graesser, in press; Graesser, Wiemer-Hastings, Wiemer-Hastings, Harter, Person, N., & the Tutoring Research Group, 2000).

The increasing demands of our Information Age make it necessary to modify our existing methods of training and to adapt new, more appropriate methods. All learners and in particular college students are increasingly required to acquire information presented on computers. Thus, it is essential to investigate how students learn such information and whether computer-based instruction is as effective as traditional training in the classroom with printed materials. Learning with computers allows students to: (a) work at their own pace, (b) review materials as often as desired, (c) access information and learn from home, (d) test their own performance, (e) correct their errors, and (f) work individually as well as in groups. There are two general advantages of web-based in comparison to traditional learning: (a) web-based materials allow learners access to newest and always updated information and (b) web-based materials allow access to multiple users in different places at the same time and provide them with the opportunity to communicate with each other on-line. In the area of teaching reading comprehension

strategies for example, the use of web-based training materials may allow a great number of learners to access training materials without the need for the presence of an instructor. There are certain disadvantages to working with computerized and web-based materials: (a) learners may not be able to monitor their own learning and performance, (b) learners who work individually do not learn how to cooperate with a group, and (c) learners may not have the appropriate guidance to avoid misunderstandings or to improve their metacognitive awareness. Obviously, computers cannot be treated as panacea and need to be carefully implemented in the learning process in order to obtain optimal results.

A solution to this problem is attempted through a new line of research on intelligent tutors (Wijekumar & Meyer, in press; Graesser, in press; McNamara, in press). According to Baylor (1999) and Callear (1999), intelligent agents can be used as tools for human learning. Their main functions involve managing large amounts of information, serving as experts, and creating programming environments for the learners (Baylor, 1999). Other uses, according to Callear, involve managing students' learning, teaching new information using multimedia techniques, and producing learning models. Patel, Kinshuk, and Russel (1999) argued that intelligent tutoring can be used within a cognitive apprenticeship environment to help decompose learning tasks into smaller components. Siemer-Matravers (1999) argued that the objective of intelligent agents is to provide a teaching tool that adapts to the students background knowledge, skills, needs, and interests. Thus, a primary function of these systems is to diagnose learners' cognitive state based on initial performance at the same time accounting for motivation, attention, and students' learning preferences (Aimeur & Frasson, 1996; Siemer-Matravers, 1999).

Research on intelligent tutoring has provided evidence that intelligent tutoring can improve learning and result in improved performance on problem solving tasks (Aimeur & Frasson, 1996; Ainsworth, Grimshaw, & Underwood, 1999; Wood & Wood, 1999). Wood and Wood investigated the effects of using an intelligent tutoring program to teach students about algebra. Participants in this study were first tested on their knowledge on algebra. Then they were trained to solve algebraic equations through the use of a computer-based tutoring program (QUADRATIC). They were then administered an algebraic test. The same test was administered again after four weeks. Wood and Wood found that high knowledge learners performed better on transfer tasks than low knowledge learners following training with intelligent agents. Additionally, seeking help from the intelligent agent increased the chances of success of both high and low knowledge learners. Moreover, they found that participants did transfer the solution to the equation they were taught to the solution of more complex equations in the algebraic test they were administered after the training. Aimeur and Frasson (1996), Ainsworth et al. (1999) and Callear (1999) also found that intelligent agents have positive effects on learning. However, their research revealed that intelligent tutoring has to be developed in a way that provides users with a wide selection of strategies and modes to choose from, in order to accommodate different learning styles. Ainsworth argued that when learners have different degrees of experience and expertise with different knowledge representations, it is essential that the intelligent tutoring program presents a choice of multiple representations to allow learners to work with their preferred choice. Allowing learners to choose the representations they want to learn from will enable them to exploit the representations, which they feel most familiar to them. In addition, representational

preferences do not depend only on prior experiences or prior knowledge but on a number of variables such as locus of control, field dependence, verbal ability, vocabulary, age, or even gender.

Technology can be used both inside and outside classroom settings to study phenomena that would otherwise be impossible to teach, such as simulations of earthquakes and volcano eruptions (Hsu, 1997). Computer-based simulations involving activities that enable the students to explore scientific phenomena promote the acquisition of knowledge and problem solving skills. Additionally, according to Hsu, computer-based simulations allow students to make observations in a realistic situated system. Using computer-based simulations and instruction has other advantages such as increasing learners' motivation (Greenfield, Camaioni et al., 1996) and promoting active learning in authentic, meaningful contexts. Additionally, research findings indicate that using computer-based training and testing procedures may result in knowledge that is transferable across a variety of tasks (Greenfield, Camaioni et al., 1996; Greenfield, Brannon, & Lohr, 1996; Taylor, Lintern, Julin, Talleur, Emanuel, & Philips, 1999; Yamamoto & Miya, 1999).

Meyer, Middlemiss, Theodorou, Brezinski, McDougall, and Bartlett (2002) investigated the effect of older adults providing web-based tutoring on the structure strategy to fifth-grade students. One third of the fifth-graders who participated in the study received web-based tutoring on the structure strategy from older adults. A second group of fifth-graders received the same web-based training materials without tutoring. Finally, the third group of fifth-graders did not receive training on the structure strategy. Overall, the results indicated that students receiving web-based training on the structure

strategy with the help of tutors improved on the total number of ideas they remembered and recalled significantly more ideas than participants not trained with the structure strategy. However, there were no significant differences between participants receiving web-based structure strategy training with the help of tutors and participants receiving web-based structure strategy training without the help of tutors on the total number of ideas remembered. Additionally, children trained to use the structure strategy remembered more important information as opposed to children who did not receive training with the structure strategy. Finally, an important finding was that children were more likely to transfer the structure strategy to reading materials of similar length and topics to those used in training (near transfer). On the other hand, children were less likely to transfer the structure strategy to reading and recalling longer passages and to a writing task (far transfer). These findings are important since they provide evidence that web-based training with a reading comprehension strategy can facilitate children's reading comprehension and recall of text information. However, to accurately determine the role and the effects of web-based training with such strategies it is necessary to compare the effects of web-based training to traditional classroom training as well as to no training.

Computer-based and web-based training does not allow students to have the same kind of interactions with other students and with a teacher as in a traditional, classroom-based learning situation. Yeung (2001) argued that web-based training is not a panacea for all training problems. Rather, it is appropriate for teaching certain skills, such as software applications or management skills. The question for the proposed study is whether web-based instruction is as effective in teaching the problem/solution structure

as the traditional/classroom instruction has been shown to be. If web-based training is as effective or more effective than classroom instruction, this would be an accessible, fast, economical way to train learners in reading strategies.

Web-based and traditional/classroom training differ on a number of variables. Questions that need to be addressed when comparing traditional and web-based training include: (a) how are the training materials organized, (b) at what pace are materials presented, (c) is there an instructor, (d) what is the level of interaction between the instructor and the student or the computer and the student, (e) are there differences between learners who prefer web-based and those who prefer traditional/classroom training, and (f) can the student interact with other students and at what extent.

Wang and Newlin (2000) investigated whether learners who choose web-based materials differ to those who prefer traditional/classroom training in cognitive-motivational and demographic characteristics. They examined college students in two sections of the same Statistical Methods in Psychology course; a web-based section and a traditional/classroom section. They found that students who chose to register in the web-based section tended to participate in different study groups (in chat room sessions) and studied more hours compared to students in the traditional/classroom section. However, participants in the web-based section had lower grades on the final exam and lower final course grades than participants in the traditional/classroom section. One possible explanation is that testing conditions on the final exam were unfamiliar (individual testing in a classroom setting as opposed to collaborating with classmates in on-line chat rooms) to students in the web-based condition. As a result they did not perform as well as expected on the final exam. Another interesting finding was that students in the web-

based section tended to have a higher external locus of control compared to students in the traditional/classroom training condition.

Theoretical Foundations of Learning to Incorporate into Computer Training

Pressley and McCormick (1995) argued that computer software should be carefully designed in order to promote good learning; such good learning is the interaction among strategic and non-strategic knowledge, metacognition, and motivation that occur in a normally functioning brain. In designing computer-training materials, one should carefully consider learner, task and instructional variables. As far as the learner is concerned, computer-training materials should first draw learners' attention to the specific content and provide appropriate feedback. Additionally, computerized training materials should aim at increasing the meaningful processing of information taught. The aim of computer software should be to provide learners with both strategic and non-strategic knowledge, but also the awareness of when and how to use what they are taught by enabling them to actively build on their existing knowledge bases. Furthermore, computerized training programs should be motivating and carefully designed to draw learners' awareness to the important information in the materials.

Arguments in favor of using computers in learning and instruction are primarily based on situated learning and constructivism theories (Hsu, 1997; Lave & Wenger, 1993). Learning is unique to each individual as a result of prior knowledge, thinking, memory, perceptions, the actions of the individual, and the interaction with the environment. Thus, each learner constructs his/her conceptual framework. Computers could be valuable tools in providing different learners with the opportunity to construct knowledge in a variety of contexts and in multiple ways. Computers can function as a

dynamic tool to scaffold learners through the process of creating flexible knowledge representations or schemata that can transfer to a variety of situations.

How well a strategy that has been taught is learned and executed by the learners depends on a number of conditions (Pressley & McCormick, 1995). The first condition is that learners have the strategy stored in long-term memory. Secondly, learners need to have knowledge of when and how to apply the strategy (conditional knowledge). The third condition is that learners have appropriate declarative knowledge to use along with the strategy. In addition, it is essential for learners to have sufficient working memory to activate the strategy. In this study students were taught strategic and non-strategic knowledge as well as conditional knowledge regarding when and where the problem/solution structure could be used.

In addition to all the above conditions, learners need to be motivated to use the strategy in a new problem or learning situation. Students are not always motivated to learn more or use what they already know. If learners think that the strategy will not help them or they simply do not find a new learning situation interesting they are not likely to use what they already know to complete a novel task. If learners expect that they will fail in a task they will be less likely to attempt to use a strategy they had been taught. If, on the other hand, learners expect that they will succeed in a task they will be more likely to attempt to use their existing knowledge to help them solve a novel task. Thus, presenting materials in a way that attracts the learners or makes them believe that they can do well on the tasks at hand is extremely important. Even though computerized training materials should be interesting, it is not necessary to present them in game form. Research has shown that children taught with game-like programs did not perform better than children

taught with drill-and-practice programs (Lepper & Malone, 1987; Malone & Lepper, 1987; Rieber, 1991).

Instructional variables are extremely important and should be carefully considered when designing computerized training materials. Since learners differ on a number of characteristics, such as short-term and long-term memory, prior knowledge, metacognition, motivation, using a single instructional approach would not satisfy the diverse needs of all learners. Therefore, a wide spectrum of instructional approaches should be implemented in computer-training materials to accommodate as many learners as possible. For example, a computerized-training program might involve direct explanation. Thus, the program could explain or model a strategy and then learners practice what they were taught. However, since learners might have a hard time learning something new the first time, a different instructional approach such as guided participation, with the program providing step-by-step directions as to how to accomplish a task, can be implemented. This might not help all the learners accomplish a task. Thus, the computerized-training program might also implement scaffolding (providing those students who have difficulty with subtle hints by suggesting strategies and directing learners' attention to important aspects of the task).

Feedback is extremely important in learning. If learners are provided feedback about when they are right or wrong, learning is more rapid than if they are not given feedback (Pressley & McCormick, 1995). In both the traditional classroom (e.g., Shunk & Rice, 1993) and with computers (Anderson, Corbett, Koedinger, & Pelletier, 1995) feedback improves the effectiveness of instruction. Feedback provides information as to what has been learned and what remains to be learned. It stimulates learners to reflect on

their responses. Immediate feedback gives learners the opportunity to directly see the effects of their actions (Marshall, 1999). If feedback informs the learner of the correctness of the solution as well as explanations regarding the reasonableness of the learner's answer it will be more effective and will help the learner construct a more adequate understanding of what was taught (Pressley & McCormick, 1995). Feedback is an aspect of computer-supported learning that may help learners become metacognitively aware thus facilitating knowledge transfer (Hogle, 1996; Marshall, 1999). In the present study feedback was provided immediately after most training exercises. The feedback consisted of step-by-step explanations of the process of analyzing each passage using the problem/solution structure.

Self-Paced Instruction

Self-paced instruction is important in learning. Learners who set their own pace while studying are more likely to actively learn the material and to create knowledge that is flexible and thus particularly transferable across a variety of tasks (Greenfield, Camaioni et al., 1996; Greenfield, Brannon, & Lohr, 1996; Taylor et al., 1999; Yamamoto & Miya, 1999). Self-paced learning may thus increase learners' interest in a learning task. As a result, learners will be more motivated and more engaged in their task. Motivation, according to Meyer and Poon (2001) influences the focusing of attention and understanding in addition to the enjoyment of a task. Learners who are motivated are more likely to put more effort and to be more persistent to attend to and to work towards successfully completing a task. If learners put more effort toward completing a task they are more likely to be more successful in their learning, thus creating stronger and more flexible knowledge representations that may be transferable to other tasks in the future.

According to Aimeur and Frasson (1996), knowledge acquisition is facilitated by the interaction of the learner with the teaching materials and the instructional system (computer) when the learning process is controlled/paced by the learner. That is one of the main reasons than many intelligent tutoring systems in the past have not yielded the expected results and have not resulted in significantly improved learning by the learners; the intelligent tutor was in control of the learning rather than the learner himself/herself. Aimeur and Frasson hypothesized that learners tend to be more motivated to engage in cognitive tasks when they are in control of their own learning. To examine this hypothesis they created an intelligent tutoring program based on the theory of learning by disturbing; that providing an intelligent tutor that acts as a troublemaker, giving both right or wrong suggestions to the learner, would allow the learners to decide themselves as to the correctness of the tutor's suggestions and as to what they needed to do to accomplish their task at hand. The results of this study indicated that learning by disturbing does enable learners to decide on their own as to their next steps in completing a task. Additionally, this method gives better results for people having good background knowledge in the domain, and seems to not facilitate learning for people with little background knowledge.

Conclusions

The literature review revealed the following gaps in existing research:

- Little has been done in the area of comparing web-based or computer-based training to traditional/classroom training and their effects on cognitive tasks. To accurately determine the role and the effects of web-based training with teaching

- strategies it is necessary to compare the effects of web-based training to traditional classroom training as well as to no training.
- There have been arguments that computers can teach certain kinds of information (i.e., software applications, management skills). However, further research needs to be conducted to investigate how effective web-based would be in teaching other kinds of knowledge such as reading strategies.
 - Empirical studies concerning ways that web-based learning could be used for supporting classroom instruction need to be conducted. Although there has been extensive research on traditional/classroom training, there needs to be more research on the interdependence between web-based training and traditional/classroom training.
 - More empirical studies need to be conducted to investigate the effects of web-based instruction on learners' motivation, interest, metacognition, problem solving, and formation of flexible, transferable background knowledge.
 - More empirical research is needed on how individual differences influence web-based learning.

Rationale and Hypotheses

Instruction in the structure strategy, regardless of method of instruction, was expected to support past research findings showing that this training increased measures of reading performance (e.g., Meyer et al., 1989). Thus, participants in the web-based training and the traditional/classroom training were predicted to have higher total recall scores, main idea scores, and top-level structure scores than participants in the control training condition. This superiority of the groups with problem/solution structure

training was expected on both the near transfer passage and the far transfer passage. The current investigation was based on the assumption that providing learners with step-by-step instruction, feedback, numerous examples and training exercises on using the problem/solution structure strategy would facilitate the construction of good, solid knowledge structures. Since transfer is not likely to occur without well-organized background knowledge, it was expected that forming a good knowledge base framework would facilitate transfer of the structure strategy.

The web-based training and traditional/classroom training were the same in the strategy, examples, and practice exercises presented and the sequence and organization of these training materials. The materials in the web-based training condition followed the same organization as the materials in the traditional/classroom training. The two training conditions differed on the pace of presenting the materials. The web-based training was paced by the student with all feedback coming from the computer, while the classroom training was paced by the instructor with feedback coming from the instructor and the training materials. The feedback provided in the computer and in the paper-and-pencil training materials was identical. To determine whether the pace of reading the instructional materials differed between the two conditions (traditional/classroom and web-based condition), the time taken by participants to go over these materials was recorded. However, both groups were given the same total time (90 minutes) to complete the training. Consequently, participants in the web-based training condition had the opportunity to reread information on a web-page, while participants in the traditional/classroom training condition went through the training materials only once with the instructor/experimenter. To determine whether participants in the web-based

training condition viewed pages more than once the number of hits on each web page was recorded. Additionally, participants in the web-based training condition did not have an experimenter/instructor available while they were studying the materials and responding to the various practice tasks. Both methods of instruction demonstrated modeling of the use of the strategy, the web-based training on-line in a short multimedia presentation and the traditional/classroom training live before the class. The experimenter also allowed participants in the traditional/classroom training condition to share some of their answers with the group and provided them with brief feedback. In the web-based training condition participants worked individually and did not interact with each other. Participants in both training conditions as well as the control condition evaluated and provided suggestions for improving the training materials.

Participants in the web-based training condition set their own pace for studying the training materials and were expected to actively learn the material creating knowledge of the structure strategy that is particularly transferable across a variety of tasks (Greenfield, Camaioni et al., 1996; Greenfield, Brannon, & Lohr, 1996; Taylor et al., 1999; Yamamoto & Miya, 1999). As a result, it was expected that participants in the web-based training condition would outperform participants in the traditional/classroom training condition on total recall, recall of main ideas, and use of top-level structure on the far transfer passage, but not the near transfer passage. This expectation was based on the assumption that participants receiving web-based training would have constructed stronger conceptual frameworks than participants in the traditional/classroom training condition. Therefore, they would be better able to identify and use the problem/solution structure equally well in the near transfer passage as well as in the far transfer passage.

Participants in the traditional/classroom training condition on the other hand were assumed to have good enough mental representations of the problem/solution structure to help them perform well on the near transfer passage, but not on the more difficult due to lack of surface similarity far transfer passage.

Since the participants in both problem/solution structure training conditions worked on the same exercises, their performance during the training was compared on their use of the top-level structure, total recall, and accurate identification of signaling words (e.g., "problem," "hazard") in the practice exercises. This comparison between the two training conditions examined participants' involvement in training and understanding during training. Also, participants in the two training conditions were compared on their attitudes toward the training. Participants in the web-based training condition were expected to have more positive attitudes toward the training than participants in the traditional training condition.

The present study examined the following hypotheses:

1. Participants receiving problem/solution structure instruction in the web-based training condition and the traditional/classroom training condition will have higher total recall scores, main idea scores, and top-level structure scores than participants in the control training condition on the near transfer passage and on the far transfer passage.
2. There will be no significant differences between the performance of participants in the two problem/solution structure training conditions on total recall scores, main ideas scores, and top-level structure scores on the near transfer passage. However, participants receiving structure strategy instruction

in the web-based training condition will score significantly higher on total recall scores, main idea scores, and top-level structure scores than participants in the traditional/classroom strategy instruction on the far transfer passage. That is, there will be a statistically significant interaction between type of instruction and transfer task.

3. Participants receiving problem/solution structure instruction in the web-based training condition will score significantly higher on top-level structure, total recall, and identification of signaling on the training exercises than participants in the traditional/classroom strategy instruction.
4. Participants receiving problem/solution structure instruction in the web-based training condition will have more positive attitudes toward training than participants in the traditional/classroom training condition.

CHAPTER 3

METHODS

Research Design

The study was a pretest-post-test control group design (see Figure 1). The independent variable was training condition (problem/solution structure web-based training, problem/solution traditional training, and no structure training/control condition). The dependent variables were (a) total number of ideas recalled from the near transfer (schizophrenia) and the far transfer (trusts or fast breeder reactors passages), (b) the number of main ideas and details remembered from the two passages, and (c) top-level structure scores. Additionally, participants' performance on the total number of ideas recalled, top-level structure scores, and use of signaling in the training/practice exercises were examined to determine their involvement in the training. Participants' opinions about the training program were also examined.

Participants were randomly assigned to three conditions. All participants first read and recalled a pretest passage to get a measure of their performance prior to training. The topics of the pretest and far transfer passage were counterbalanced and randomly assigned to participants within the three experimental conditions. The pretest passage for half of the participants in each of the three conditions was the trusts passage; the other half read and recalled the fast breeder reactors passage. Participants in the first condition were given traditional/classroom training on using the problem/solution structure when reading and recalling information. Participants in the second condition received web-based training with the same materials on using the problem/solution structure.

Participants in the third condition were not trained on using the problem/solution structure and were not given information about the existence of reading structures for organizing text information. Instead, participants in this condition completed a web-based training course offered by The Pennsylvania Training University on using Hypertext Markup Language (HTML) for developing web pages. Finally, all participants read and recalled two passages to determine the effects of the web-based and traditional training on students' performance. The first passage (near transfer) was a passage about schizophrenia. The second passage (far transfer task) was either the trusts passage or the fast breeder reactors passage. The reason for counterbalancing the trusts and fast breeder reactors passages over the pretest and second post-test tasks was to make sure that differences in students' performances prior to and after training were due to treatment and not the result of different aspects of the passages.

Participants

Data for the proposed study were collected during the spring 2002 semester. Students participating were 99 undergraduate students at The Pennsylvania State University enrolled in introductory courses in Educational Psychology. All students received extra credit points for their participation in the study. Six of the participants were dropped out of the statistical analyses due to the fact that they were already familiar with the structure strategy through participation in prior structure strategy training. Thus, only the data for 93 students were entered in the analyses. Participants were randomly assigned to three conditions. Participants in the traditional/classroom training condition were 37, and four participants with prior training were dropped from this condition ($N=33$). Participants in the web-based training condition were 35, and no participants

were dropped from this condition ($N=35$). Participants in the control condition were 27, and two participants with prior structure strategy training in the control condition were dropped ($N=25$).

Materials

General Reading Instructions. Instructions provided information about the passages and recall tasks and how to report ideas remembered from the passages; a copy of the instructions can be found in Appendix A. After reading a passage, participants were asked to do a recall task, in which they placed the text in an envelope and then wrote all they could recall from the passage.

Problem/Solution Structure Training Materials (Traditional Training). The training materials (Meyer et al., 1989) for the problem/solution traditional training included a definition of the problem/solution structure, signaling words to help the reader identify the problem/solution organizational structure of passages, and a template for writing with the problem/solution structure. Additionally, the training materials included a number of short passages for students to practice recognizing the problem/solution structure and reading and recalling of text information using the problem/solution structure (see Appendix B). Furthermore, the experimenter modeled use of the problem/solution strategy with a passage on osteoporosis (see Appendix B). Participants in the traditional/classroom training condition individually read and found the structure and the signaling words for a number of short passages. Participants in this condition received brief feedback from the instructor, as well as written feedback included in the training materials. Other than the brief feedback and the instructions provided by the instructor there was no other communication between the instructor and the participants.

Participants were not allowed to work in groups during the session nor to communicate in any way with other participants in their session.

Problem/Solution Structure Training Materials (Web-based Training). The training materials for the web-based training condition included the same definition, signaling words, and template for the problem/solution structure as the traditional training materials (<http://www.personal.psu.edu/staff/e/s/est113/training> - see Appendix C).

Additionally, participants worked with the same short practice passages as the traditional training condition. Participants read and recalled these passages on-line. The web-based materials for participants in this condition included an on-line video of the experimenter modeling use of the problem/solution strategy with a passage about osteoporosis.

Participants in this condition received the same written feedback as participants in the traditional/classroom training condition. Other than the instructions provided by the instructor there was no other communication between the instructor and the participants. Participants worked individually with no feedback from the instructor and were not allowed to work in groups or to communicate in any way with other participants during their research session.

No Training/Control Condition Materials. The materials for the no strategy training/control condition included web-based training on HTML (<http://cac.psu.edu/training/Web201>). Additionally, participants received a set of general instructions about how to work on the HTML materials (see Appendix D). Other than the instructions provided by the instructor there was no other communication between the instructor and the participants. Participants worked individually with no feedback from

the instructor and were not allowed to work in groups or to communicate in any way with other participants during their research session.

Pretest and Post-test Materials

Schizophrenia Passage. The first post-test task administered was a passage about schizophrenia (Meyer, 1975; Meyer et al., 1989). The passage contained 506 words and 191 scorable idea units and it was organized with the problem/solution structure. Participants in all conditions received the same version of the schizophrenia passage that was organized with the problem/solution structure and contained signaling words matching this structure (see Appendix E). This passage served as a near transfer task, to determine whether participants who read short passages about mental health issues during training would correctly identify and use the problem/solution structure on a longer passage about a different mental health issue.

Trusts Passage. The trusts passage (see Appendix F) was administered either during the pretest or the post-test 2. The trusts passage was organized with the problem/solution structure and included signaling words for this structure. It contained 506 words and 191 scorable idea units (Meyer et al., 1989). All participants received the same version of this passage about trusts, vehicles for solving some problems in distributing wealth at death. The trusts passage served as a far transfer task when administered at post-test 2 and recall from it was examined to determine whether participants used the problem/solution structure while reading and recalling information from a passage on a topic not related to the training materials.

Fast Breeder Reactors Passage. The fast breeder reactors passage (see Appendix G) was administered either at pretest or at post-test 2. This passage was organized with

the problem/solution structure and included signaling words for this structure. It contained 506 words and 191 scorable idea units (Meyer, 1975; Meyer et al., 1989). All participants received the same version of this passage about problems with current energy needs and sources and nuclear breeder reactors as a possible solution to these problems. The fast breeder reactors passage also served as a far transfer task when administered at post-test 2.

Questions on the Second Post-test Passage. Participants could receive up to seven points on questions about the second post-test passage (Meyer et al., 1989; Appendix H). The same questions were used for both the trusts and the fast breeder reactors passages. Participants reading trusts answered these questions in respect to the passage they read. Participants reading the fast breeder reactors passage responded to these questions regarding the fast breeder reactors passage. These questions were: (a) what are the three related problems discussed in the article (3 points), (b) what does the author say is the solution to these problems (1 point), and (c) give three reasons provided by the author to explain why the proposed solution will solve some of the problems (3 points).

Verbal Ability Measure. The Quick Word Test (Borgatta & Corsini, 1964, 1993) was administered to assess verbal ability (see Appendix I). This is an 80-item multiple-choice test for which participants had to read a word and choose among four given words the one closest to the meaning of the original word. The original 100-item Quick correlates 0.83 with the Wechsler Adult Intelligence scale (Meyer & Rice, 1983). The Cronbach alpha coefficient for the 80-item Quick was estimated to be above 0.92. According to Ainsworth (1999) and Winn (1987), variables such as verbal ability and vocabulary provide learners with a rich source of domain representations, which allow

them to construct new knowledge representations. Such knowledge can then be used to identify the underlying structure of a cognitive task, particularly in the case of reading comprehension or reading recall tasks. Since the present study involves such reading comprehension and recall tasks it was judged appropriate, if not necessary to investigate participants' verbal ability.

Opinions about Training Program. Participants were asked to evaluate the training program, to express their opinions about the way the training materials were presented and to suggest changes to improve the program. Two slightly different versions of this questionnaire were administered, one for the web-based training and control conditions (see Appendix J) and one for the traditional/classroom training condition (see Appendix K).

On-line Web-page Tracking Programs. To keep track of the time taken by participants in the web-based training condition to go over the training materials, two on-line web-page tracking programs were used. These programs were Sitestats (<http://www.sitestats.com>) and Extreme Tracking (<http://www.extremetracking.com>). These programs provided information regarding the time participants logged onto each web page of the web-based training materials as well as the web pages each participant visited during training and the number of hits on each web page by each participant.

Procedure

Students participated in one session lasting approximately three hours. All participants were given the same oral introductions by the researcher. Students signed up for one experimental session. The investigator then randomly assigned each experimental session to one of the following conditions: (a) traditional, classroom structure strategy

training, (b) web-based structure strategy training, and (c) no strategy training, control condition.

Participants were allotted 15 minutes for reading and recalling each of the pretest and post-test passages. Training with the problem/solution structure took 90 minutes. To determine the exact time required for the problem/solution structure training and to ensure that participants in all conditions would be allotted the same amount of time for training, a traditional/classroom training condition was conducted first. The time taken by that training session (90 minutes) was the time allotted for the other training sessions. The time allotted for responding to the Quick Word Test was 15 minutes. The time allotted for answering the questions about the final passage read in the session was 5 minutes. Finally, the time allotted for responding to the opinions about training questionnaire was 10 minutes.

During the session, participants in the traditional/classroom training condition first read the general reading instructions (Appendix A) and then read, and recalled the pretest passage (trusts or fast breeder reactors). Then, they were trained on the problem/solution structure by the experimenter in a traditional classroom setting. They received a booklet with information about the problem/solution structure, signaling words, and a template to help them when reading and recalling information from passages organized with the problem/solution structure (Meyer et al., 1989). The experimenter explained the information provided in the participants' booklets and provided an example of how to use the problem/solution structure when reading and recalling text information with a passage about problems and a solution for osteoporosis. The osteoporosis article was organized identically to the pretest and post-test passages

and contained the same number of words. Then, participants had the opportunity to individually practice reading, recalling, and composing short passages organized with the problem/solution structure.

Participants in the web-based training condition first read general reading instructions (Appendix A) and then read and recalled the pretest passage (trusts or fast breeder reactors) in paper-and-pencil form. Then, they were instructed by the experimenter to carefully read and follow the instructions on their computer monitors. The experimenter also mentioned to the students that they would be allotted 80 minutes (exact time matched the time of traditional training condition) to work on the training materials and that they would not be allowed to move to the next task prior to the end of the allotted time. Participants in this condition read the same information about the problem/solution structure in the same order as participants in the traditional training condition. Additionally, their training materials included a short video of the experimenter modeling the use of the problem/solution structure with the osteoporosis passage. Then, they had the opportunity to individually practice reading, recalling, and composing short passages organized with the problem/solution structure on-line and were asked to submit all their responses to the experimenter on-line.

Participants in the no structure strategy training/control condition first read the general reading instructions (Appendix A) and then read and recalled the pretest passage (trusts or fast breeder reactors). Then, they worked on a short web-based training program about using Hypertext Markup Language (HTML) to develop web pages. The experimenter instructed the students that they would be allotted approximately 90 minutes (time matched to the other conditions) to work on the training materials and that

they would not be allowed to move to the next task prior to the end of the allotted time. They worked individually on the training program's assignments and attempted to develop their own web pages.

All participants then read the passage about schizophrenia (near transfer task). They were asked to write down all they could remember from the passage using words from the passage or their own words, and to write in complete sentences, rather than just listing words remembered. Participants were instructed to underline no more than three important sentences in the passage. The time allotted for reading and recalling the passage was 15 minutes.

Upon completing their recalls of the schizophrenia passage, all participants responded to the Quick Word Test (Borgatta & Corsini, 1964, 1993). The time needed to complete this task was 15 minutes. This task served as a buffer task between the schizophrenia and the post-test 2 passage (trusts or fast breeder reactors).

Participants then read, recalled, and answered questions about the post-test 2 passage (far transfer task). Participants who read and recalled trusts passage during pretest read and recalled fast breeder reactors during post-test 2. Participants who read fast breeder reactors during pretest read and recalled the trusts passage for post-test 2. All participants were instructed to underline no more than three important sentences in the passage while reading. They were asked to write down all they could remember from the passage using words from the passage or their own words, and to write in complete sentences, rather than just listing words remembered. The time allotted for reading and recalling the passage and answering the questions was 20 minutes.

Scoring Procedures

The prose analysis system by Meyer (1975, 1985) was used to score students' recall protocols. The purpose of scoring was to examine participants' recall of topic content and of relationships among aspects of the topic content. Nine criteria were considered while scoring the organization of top-level structure used to organize recall from a passage (Meyer, 1985; for a detailed description see Appendix L). Three recall protocols were collected from each participant; one for the schizophrenia passage, one for the trusts passage, and one for the fast breeder reactors passage. Ten percent of the recalls from each of the three passages were randomly selected and scored by the same scorer approximately four years later to determine the intrarater reliability coefficients, measured by Pearson product-moment correlation coefficients, for the total number of ideas and main ideas recalled from each passage and the intrarater reliability for top-level structure. The intrarater reliability score for the total number of ideas recalled from the schizophrenia passage was .94; for main ideas the intrarater reliability was .94 and for top-level structure .90. The intrarater reliability score for the total number of ideas recalled from the trusts passage was .86; for main ideas the intrarater reliability was .91 and for top-level structure .88. The intrarater reliability score for the total number of ideas recalled from the fast breeder reactors passage was .92; for main ideas the intrarater reliability was .91 and for top-level structure .95.

Participants' answers on the trusts and on the fast breeder reactors passage questions were scored using the same criteria described by Meyer et al. (1989). The questions were relevant to the main problem and solution ideas in the trusts and in the

fast breeder reactors passages. There were 7 possible points for the questions on each of the two passages.

For the scoring of the Quick Word Test, the scoring key provided by Borgatta and Corsini (1993) was used. Each correct answer received one point for a total of 80 possible points.

Figure 1

Research design

<u>Condition</u>	<u>Task</u>			
	Pretest (1/2 Fast Breeder Reactors 1/2 Trusts)	Post-test 1 (Schizophrenia)	Quick Word Test	Post-test 2 (1/2 Trusts 1/2 Fast Breeder Reactors)
Web-based Structure Strategy Instruction				
Traditional Structure Strategy Instruction				
No Training with Structure Strategy /Control Condition				

Dependent variables:

- 1) Use of top-level structure (TLS)
- 2) Total number of ideas recalled
- 3) Recall of main ideas

CHAPTER 4

RESULTS

Effects of Passage Topic

Passage topic for the pretest and far transfer post-test was counterbalanced. Participants within each training group were randomly assigned to read either the Fast Breeder Reactor Passage or the Trust Passage on the pretest; they read the alternate passage on the post-test. A MANOVA was calculated to investigate differences between the two passage topics on total recall, recall of main ideas, and use of top-level structure scores. The results of this analysis indicated that the two passage topics were significantly different (Wilks's Lambda = 0.14; $F(3,89) = 183.32, p < 0.005$). The univariate Fs for total recall ($F(1,91) = 1.14, \text{MSE} = 206.33, p = 0.29$) and recall of main ideas between the two topics were not statistically significant ($F(1,91) = 0.02, \text{MSE} = 1.83, p = 0.88$). The univariate F for use of top-level structure was statistically significant ($F(1,91) = 7.34, \text{MSE} = 61.12, p < 0.005$). Participants recalling the Fast Breeder Reactors passage at pretest found it easier to identify and use the top-level structure of the passage as opposed to those who read and recalled the Trusts passage. The means and standard deviation scores for the three dependent variables are presented in Table 1.

Experimental Groups Prior to Training.

Prior to examining the effects of training with the problem/solution structure, the experimental conditions (problem/solution structure web-based training, problem/solution structure traditional training, and no training/control) were compared on

vocabulary scores, as measured by the Quick Word Test. Additionally, pretest scores on the total number of ideas recalled and use of top-level structure were compared to determine pre-training differences on recall and to examine whether participants in the three conditions varied in their use of the problem/solution structure prior to training. A multivariate analysis of variance (MANOVA) was calculated to examine whether the three experimental conditions varied on vocabulary, recall, or use of the strategy prior to instruction. The results of this analysis indicated that the three conditions were not significantly different prior to training (Wilks's Lambda = 0.90; $F(8,174) = 1.25$, $p = 0.27$); none of the univariate Fs were statistically significant (for vocabulary $F(2,90) = 1.69$, $MSE = 204.53$, $p = 0.19$, for total number of ideas recalled $F(2, 90) = 0.16$, $MSE = 30.00$, $p = 0.85$, for main ideas recalled $F(2, 90) = 0.17$, $MSE = 13.74$, $p = 0.83$, and for use of top-level structure $F(2, 90) = 1.42$, $MSE = 12.51$, $p = 0.25$). The means and standard deviation scores for vocabulary and pretest recall of total number of ideas and main ideas and use of top-level structure are presented in Table 2. The findings from these statistical analyses indicate that the three conditions were not statistically different prior to training on vocabulary, text recall, and use of the top-level structure.

Effects of Training on Recall Scores and on use of the Top-Level Structure.

The first hypothesis stated that participants receiving problem/solution structure instruction in the web-based and in the traditional/classroom training conditions will have higher total recall scores, main idea scores, and top-level structure scores than participants in the control training condition on the near transfer passage and on the far transfer passage. To investigate this hypothesis two separate MANOVAs were calculated, one for the near task and one for the far transfer tasks.

Near Transfer. The first MANOVA examined the differences among the three experimental conditions on total recall scores, main idea scores, and top-level structure scores on the near transfer (Schizophrenia) passage. The analysis revealed significant differences among the three experimental conditions (Wilks's Lambda = 0.77; $F(6, 176) = 4.125, p < 0.005$).

A follow-up one-way ANOVA showed significant differences among the three conditions on total recall scores ($F(2,90) = 3.57, MS = 377, p < 0.03$). As can be seen in Table 3, participants in the traditional/classroom training condition outperformed those in the control condition (Tukey_a = 0.03) but not those in the web-based training condition (Tukey_a = 0.18). Participants in the web-based training condition did not differ significantly from the control group on total recall (Tukey_a = 0.60). The results partially provide support to the hypothesis that participants in the two training conditions would outperform participants in the control condition on total recall scores. Participants in the traditional/classroom training condition did outperform those in the control condition. However, participants in the web-based training condition did not recall significantly greater information than participants in the control condition from the near transfer passage.

A second one-way ANOVA was calculated to examine differences among the three conditions on the top-level structure measure. The ANOVA showed significant differences among the three conditions on the top-level structure measure ($F(2,90) = 11.19, MS = 58.85, p < 0.01$). Participants in the traditional/classroom training condition performed significantly better than those in the control condition (Tukey_a = 0.00). Participants in the web-based training condition performed significantly better than

participants in the control condition on the top-level structure measure (Tukey_a = 0.00) There were no significant differences between participants in the traditional/classroom training and the web-based training conditions (Tukey_a = 0.57). The data supports the hypothesis that participants receiving instruction with the structure strategy would perform significantly better than participants in the control condition on the use of the top-level structure measure.

Contrary to predictions there were no significant differences among the three training conditions on recall of main ideas ($F(2, 90) = 2.23$, $MSE = 158.05$, $p = 0.11$). Table 3 presents the mean and standard deviation scores for total recall, main ideas, and top-level structure scores on the schizophrenia passage by condition.

Far Transfer. A second MANOVA was calculated to examine differences among the three conditions on total recall scores, main idea scores, and top-level structure scores on the far transfer (Fast Breeder Reactors or Trusts) passage. See Table 4 for the means and standard deviations on the far transfer task total recall, main idea scores, and top-level structure scores. The analysis showed significant differences among the experimental conditions (Wilks's Lambda = 0.82; $F(6, 174) = 2.91$, $p < 0.01$). The univariate Fs for total recall ($F(2, 89) = 0.77$, $MSE = 129.14$, $p = 0.47$) and for main idea scores ($F(2, 89) = 0.68$, $MSE = 55.60$, $p = 0.51$) using raw scores were statistically not significant. The univariate F for use of top-level structure was statistically significant ($F(2, 89) = 6.85$, $MS = 39.95$, $p < 0.01$). The findings regarding total recall scores and recall of main ideas did not provide support to the hypothesis that participants in the two training conditions would outperform participants in the control condition on the far transfer task.

Although main ideas were not affected by experimental condition on the far transfer task, there was some support for the positive effects of structure strategy training on far transfer in terms of how participants organized their recalls as measured by the top-level structure scores. Multiple comparison tests were calculated to examine the statistically significant difference among the conditions on the far transfer top-level structure scores. Participants in the traditional/classroom training condition performed significantly better than those in the control condition ($Tukey_a = 0.03$). Participants in the web-based training condition performed significantly better than participants in the control condition on the top-level structure measure ($Tukey_a = 0.07$). There were no significant differences between participants in the traditional/classroom training and the web-based training conditions ($Tukey_a = 0.93$). The hypothesis that participants in the traditional/classroom training condition and in the web-based condition would perform better than participants in the control condition on the use of the top-level structure measure on the far transfer task was supported by the data.

To further investigate the effects of training conditions on main ideas recalled on the transfer task, the question data were examined. To determine whether the three experimental conditions differed on their responses to the main idea questions answered after reading and recalling the last passage (trusts or fast breeder reactors) a one-way ANOVA was calculated. The results showed no significant differences among the three experimental conditions ($F(2,90) = 2.88$, $MS = 5.54$, $p = 0.06$). This corroborates the data from the recall of main ideas; the main idea question data also indicate that research condition did not influence significantly participants' understanding of main ideas.

In Table 5 the percentage of participants in each experimental condition using the problem and solution top-level structure (scores of 6 to 9 on the top-level structure scale) are displayed for the pretest, post-test 1 – near transfer, and post-test 2 – far transfer. As noted in Table 5 the control group shows stable performance across training with half of the participants organizing their recalls with a problem and solution top-level structure. In contrast, training gains are seen for both structure strategy training groups; the traditional/classroom structure strategy group jumps from 58% on the pretest to 94% on the post-tests. The web-based strategy group jumps from 63% on the pretest to about 71% on the post-tests.

To further investigate the use of the top-level structure three Chi-square analyses were conducted. Participants' top-level structure scores were recoded (scores of 6 or greater on the top-level structure scale were recoded as use of top-level structure, while scores of 1 through 5 were recoded as no use of top-level structure). In the first analysis use of top-level structure on the pretest was investigated ($\chi^2 (1, N = 68) = 1.42, p = 0.23$); 56% of the participants used the top-level structure at pretest (of these 42% were participants in the traditional/classroom condition and 58% were participants in the web-based training condition).

The second Chi-square analysis investigated use of the top-level structure on the post-test 1 passage (schizophrenia). The results ($\chi^2 (1, N = 68) = 0.65, p = 0.49$) indicated that 81% of the participants used the top-level structure on the schizophrenia passage (of these 51% were in the traditional/classroom condition and 49% were participants in the web-based training condition).

The third Chi-square analysis examined use of top-level structure on post-test 2 ($\chi^2 (1, N = 67) = 0.07, p = 0.78$). Interestingly, 83.5% of the participants used the top-level structure on post-test 2 (of these 50% were participants in the traditional/classroom training condition, while 50% were participants in the web-based training condition). It is apparent that use of the top-level structure increased from pretest to the two post-test tasks for students who received instruction with the structure strategy.

Interaction Between Training Condition and Transfer Task on Total Recall Scores, Main Idea Scores, and Top-level Structure Scores.

The second hypothesis posited that there would be no significant differences between the performance of participants in the two problem/solution structure training conditions on total recall scores, main idea scores, and use of top-level structure scores on the near transfer passage, but that participants in the web-based training condition would have significantly higher scores on these measures than participants in the traditional/classroom training condition on the far transfer passage. A significant main effect was expected for training condition, but not transfer task, and a significant interaction was expected between training condition and transfer task.

A MANOVA with repeated measures was calculated to examine the second hypothesis. A multivariate analysis of variance was conducted on the total recall scores, main idea scores, and use of top-level structure scores with repeated measures on transfer task: post-test 1 (near transfer task) and post-test 2 (far transfer task). The analysis showed no significant differences between the experimental conditions (Wilks' Lambda = 0.95; $F(3, 63) = 1.13, p = .34$) nor between the near and far transfer tasks (Wilks'

Lambda = .97; $F(3, 63) = .77$, $p = .51$). In addition, the predicted training condition by transfer task was not statistically significant (Wilks' Lambda = .997; $F(3, 63) = .07$, $p = .98$). It is clear from the repeated measures MANOVA analysis that the hypothesis that there would be no significant differences between the performance of participants in the two problem/solution structure training conditions on total recall scores, main idea scores, and use of top-level structure scores on the near transfer passage, but that participants in the web-based training condition would have significantly higher scores on these measures than participants in the traditional/classroom training condition on the far transfer passage was not supported. Contrary to predictions there were no significant differences between participants in the two experimental conditions on neither the near transfer nor the far transfer task.

Differences Between Two Problem/Solution Strategy Training Conditions on Training Exercises.

According to the third hypothesis, participants receiving problem/solution structure instruction in the web-based training condition were expected to score significantly higher on identification and use of top-level structure, total recall, and identification of signaling on the training exercises than participants in the traditional/classroom strategy instruction. To investigate this hypothesis, three MANOVAs were calculated. Participants' scores on the training exercises were added up and entered into the first MANOVA. These training exercises simply required participants to read and identify the top-level structure used in the passage, as well as underline the correct signaling words in the passage that cued readers to the structure.

The results indicated significant differences between the two training conditions (Wilks's Lambda = 0.70; $F(2, 44) = 9.75, p < 0.005$).

A follow-up one-way ANOVA was calculated to investigate differences between the two training conditions on identification of top-level structure in the training exercises. The results showed significant differences between participants in the traditional/classroom training condition and those in the web-based training condition ($F(1,45) = 13.72, MS = 15.53, p < 0.005$). Participants in the traditional/classroom training condition were significantly better than those in the web-based training condition at identifying correctly the organization of passages in the training exercises (see Table 7). This finding does not provide support to the hypothesis that participants receiving problem/solution structure instruction in the web-based training condition would score significantly higher on identification and use of top-level structure, total recall, and identification of signaling on the training exercises than participants in the traditional/classroom strategy instruction.

A second follow-up one-way ANOVA examined differences between the two training conditions on the identification of signaling words in the training exercises measure. The results of this analysis revealed significant differences between participants in the traditional/classroom training condition and participants in the web-based training condition ($F(1,45) = 12.36, MS = 69.15, p < 0.005$). Participants in the traditional/classroom training condition were significantly better than those in the web-based training condition at correctly identifying signaling words in the training exercises. Once again, this finding does not provide support to the third hypothesis. Table 7 presents the mean and standard deviation scores for the training exercises.

Another MANOVA was calculated to investigate the same hypothesis. The dependent variables in this analysis were the total recall and use of top-level structure from the Rat Allergies passage. Even though this passage was used as part of the training materials, it required participants to not only identify the top-level structure and the signaling words, but also to write all they could recall from the passage. Therefore, it was scored in a more elaborate and detailed manner. Since it was important to also examine participants' recall of ideas from this training passage, the data for this passage were analyzed separately. The results indicated no significant differences between the two training conditions (Wilks's Lambda = 0.98; $F(2, 49) = 0.54$, $p = 0.58$).

A third MANOVA was calculated to investigate the same hypothesis. The dependent variables in this analysis were the total recall and use of top-level structure from the Treating Manic-Depressive Illness passage. Even though this passage was used as part of the training materials, it required participants to not only identify the top-level structure and the signaling words, but also to write all they could recall from the passage. Therefore, it was scored in a more elaborate and detailed manner. Since it was important to also examine participants' recall of ideas from this training passage, the data for this passage were analyzed separately. The results indicated no significant differences between the two training conditions (Wilks's Lambda = 0.98; $F(2, 48) = 0.43$, $p = 0.65$). Clearly, there was no support for the third hypothesis predicting better performances within the training materials for students in the web-based training condition. Table 8 presents the mean and standard deviation scores for total recall, recall of main ideas, and use of the top-level structure on the rat allergies and the treating manic-depressive illness passages.

Attitudes Toward Training.

Participants receiving problem/solution structure instruction in the web-based training condition according to the fourth hypothesis were expected to have more positive attitudes toward training than participants in the traditional/classroom training condition. Since most participants' responses to the Opinions about Training Program questionnaire (Appendix J and Appendix K) yielded dichotomous data, they were analyzed using separate Chi-square analyses. The Chi-square analyses reported here are based on the traditional/classroom and web-based condition data only. Chi-square values comparing all three conditions are reported in Tables 9 and 10.

The first Chi-square analysis investigated participants' opinions as to whether the training they received would help them remember more from their reading in everyday life. The results showed that type of structure strategy instruction did not affect participants' beliefs as to whether training would influence their recall from everyday reading ($\chi^2 (1, N = 66) = 1.24, p = 0.26$); 93.75% of the students in the traditional/classroom training condition believed they would be able to remember more from reading in everyday life after their participation in the study, while 85.30% of the participants in the web-based training condition shared this belief. This suggests that participants in both training conditions felt they could use the structure strategy to help them in their everyday reading. Table 9 shows percentages and Chi-square analyses for all three experimental conditions.

The second question in the Opinions about Training Program questionnaire was whether participants felt their recall of classroom reading materials would improve after the research session. The results showed that condition for structure strategy training did

not affect participants' beliefs as to whether their recall of classroom reading materials would improve after the research session ($\chi^2 (1, N = 66) = 0.19, p = 0.66$); 81.25% of the students in the traditional/classroom training condition and 85.30% of the participants in the web-based training condition believed they would be able to remember more from their classroom readings after their participation in the study. This suggests that participants in the two training conditions felt they could use the structure strategy to help them with their classroom readings. Table 9 shows percentages and Chi-square analyses for all three conditions and indicates that few participants (28%) in the control condition without structure strategy instruction anticipated gain in memory of classroom reading after participating in the research study.

Another Chi-square analysis was calculated to determine participants' opinions regarding their ability to recall passages presented to them at the beginning and at the end of the research session. The results indicated that type of instruction used to deliver structure strategy instruction did not influence participants' belief as to whether their recall of passages changed after training with the structure strategy ($\chi^2 (1, N = 67) = 2.72, p = 0.09$); 84.85% of the participants in the traditional/classroom training condition believed they remembered more from the passages they read after they received training with the structure strategy (post-test1 and post-test 2), while 67.65% of the participants in the web-based training condition shared this belief. The results indicate that most of the participants in the two training conditions felt their recall of text improved after training with the structure strategy. Table 9 shows percentages and Chi-square analyses for all three conditions; only 36% of the control participants noted improvement in memory of texts at the end of the session.

The fourth question on the Opinions about Training Program questionnaire was whether participants' interest in reading increased after the research session. A Chi-square analysis was calculated to examine differences among the three conditions on this question. The results showed that regardless of the structure strategy condition, participants did not feel their interest in reading was increased ($\chi^2 (1, N = 67) = 0.97, p = 0.32$); only 24.24% of the students in the traditional/classroom training condition and 14.71% of the participants in the web-based training condition believed their interest in reading increased. Table 9 shows percentages and Chi-square analyses for all three conditions.

An additional Chi-square test was calculated to investigate students' opinions as to whether their enjoyment of reading increased after the research session. The results showed that regardless of the conditions for teaching the structure strategy, participants felt their enjoyment in reading was not increased ($\chi^2 (1, N = 67) = 0.97, p = 0.32$); only 24.24% of the students in the traditional/classroom training condition and 14.71% of the participants in the web-based training condition believed their interest in reading increased. Table 9 shows percentages and Chi-square analyses for all three conditions.

A sixth Chi-square analysis was calculated to examine whether participants felt they would remember different kinds of information from everyday reading after the research session. The results showed that structure strategy condition did not affect participants' beliefs as to whether training would influence the kind of information they would recall from their future everyday reading ($\chi^2 (1, N = 66) = 0.00, p = 0.93$); 87.50% of the students in the traditional/classroom training condition and 88.24% of the participants in the web-based training condition believed they would remember different

kinds of information from reading in everyday life after their participation in the study. This suggests that participants in the two training conditions felt that the training they received would cue them to look for different kinds of information in their everyday reading and that they could use the structure strategy to help them remember different kinds of information. Table 9 shows percentages and Chi-square analyses for all three conditions.

Another Chi-square test was calculated to examine whether participants felt they would be able to remember different kind of information from their classroom readings after the research session. Interestingly, the results showed that research condition did not affect participants' beliefs as to whether they would be able to recall different kind of information from their classroom reading materials after the research session ($\chi^2 (1, N = 92) = 1.26, p = 0.26$); 81.82% of the students in the traditional/classroom training condition and 91.18% of the participants in the web-based training condition believed they would be able to remember different kind of information from their classroom readings after their participation in the study. This suggests that participants in the two training conditions felt they could use the structure strategy to help them remember different kind of information from their classroom reading. Table 9 shows percentages and Chi-square analyses for all three conditions.

The eighth question on the Opinions about Training Program questionnaire was whether participants tried to figure out how a passage was organized when reading during the research session. The results of the Chi-square analysis showed that structure strategy condition did not affect participants in trying to figure out how a passage was organized when reading passages during the research session ($\chi^2 (1, N = 67) = 0.50, p = 0.48$);

90.91% of the students in the traditional/classroom training condition and 85.30% of the participants in the web-based training condition tried to figure out how the passages were organized during the session. Most of the participants that received structure strategy training, regardless of type of instruction, reported trying to figure out how the texts were organized. Table 9 shows percentages and Chi-square analyses for all three conditions; interestingly, most participants in all three conditions answered yes to this question indicating that they tried to figure out how a passage was organized.

The ninth question on the Opinions about Training Program questionnaire was whether participants tried to evaluate their interest in a passage while reading during the research session. The results of the Chi-square analysis showed that condition did not affect participants in trying to figure whether they were interested in a passage during the research session ($\chi^2 (1, N = 67) = 0.78, p = 0.37$); 63.64% of the students in the traditional/classroom training condition and 52.94% of the participants in the web-based training condition reported that they evaluated their interest in a passage during the session. Table 9 shows percentages and Chi-square analyses for all three conditions; most participants in all three conditions claimed to evaluate their interest in passages read during the study.

Question eleven on the Opinions about Training Program questionnaire was whether participants liked the way the materials were presented. The results of the Chi-square analysis showed that two conditions providing structure strategy training affected participants' opinions about the presentation of the training materials ($\chi^2 (2, N = 59) = 20.33, p < 0.01$); none of the participants in the traditional/classroom training condition reported they liked the way the materials were presented, 85.71% reported they

somewhat liked the way the materials were presented, and 14.29% said they did not like the way the materials were presented (see Table 10). In contrast, 51.61% of the participants in the web-based training condition said they liked the way the materials were presented, 45.16% said they somewhat liked the presentation of the materials, and only 3.23% said they did not like it. It is apparent from these findings that participants in the web-based training condition liked the way the materials were presented more than participants in the traditional/classroom training. The difference between the two training conditions could be due to the fact that the web-based training materials were presented in a more attractive way than the paper and pencil materials (see Appendices B and C). As seen in Table 10, about 48% of the participants in the control condition did not like the way their materials about HTML were presented on-line.

Question twelve on the Opinions about Training Program questionnaire assessed participants' interest in the materials. The results of the Chi-square analysis showed that instructional method for presentation of the structure strategy affected participants' interest in the training materials ($\chi^2 (2, N = 58) = 21.56, p < 0.01$); none of the students in the traditional/classroom training condition found the materials interesting, 55.56% said they found the materials somewhat interesting, while 44.44% said they did not find the materials at all interesting (see Table 10). In contrast, 51.61% of the participants in the web-based training condition said they found the materials interesting, 38.71% said they found the materials somewhat interesting, and only 9.58% said they did not find the materials interesting. It is apparent from these findings that participants in the web-based training found the materials more interesting than participants in the traditional/classroom training condition. The web-based training materials were presented in an easy to

comprehend, attractive way, thus yielding greater interest from the participants. Again, as seen in Table 10, 48% of the participants in the control condition did not find the materials interesting.

Another Chi-square analysis was calculated to investigate participants' opinions as to the difficulty of reading the materials they worked with in their training sessions. The results of the Chi-square analysis showed that the two structure strategy training conditions did not affect participants' opinion about difficulty of the training materials ($\chi^2 (2, N = 59) = 1.91, p = 0.38$) most of the participants in both groups found the materials of normal difficulty as seen in Table 10.

Question fourteen required participants to state whether they would be willing to participate in other similar studies. The results of the Chi-square analysis showed that structure strategy training conditions did affect participants' willingness to participate in a similar study in the future ($\chi^2 (2, N = 59) = 21.97, p = 0.00$); none of the participants in the traditional/classroom training condition said they would like to participate in similar studies in the future, 85.71% said they might participate again in a similar study, while 14.29% said they did not care to participate in similar studies (see Table 10). In contrast, 54.84% of the participants in the web-based training condition said they would like to participate in similar studies, 41.94% said that perhaps they would participate, while only 3.23% said they would not choose to participate in a similar study in the future. As seen in Table 10 about 29% of the participants in the control HTML training would not volunteer for similar studies.

Question ten on the Opinions about Training Program questionnaire (see Appendices J and K) was a free response item and required participants to state what, in

their point of view, were the changes in their reading and recall after the research session. Frequency counts of the free responses were tallied to determine the opinions volunteered by participants from each condition and their percentage. The frequencies and percentages for the answers given to this question are presented in Table 11. The results revealed that 58.62% of the participants in the traditional/classroom condition, 46.67% of the participants in the web-based condition, and 10% of the participants in the control condition believed that they read with more attention to the structure used by the author to organize a passage after training. Interestingly, only 3.45% of the participants in the traditional/classroom condition and 10% of the participants in the web-based condition mentioned that they tended to look for main ideas rather than look for the structure of the passages, while 35% of the participants in the control condition mentioned that they looked for main ideas. This tendency of participants in the control condition to look for important information in the passages that would help them remember more from what they read might explain to a degree the finding that they performed similar to the two training conditions in recall of main ideas on both the near and far transfer passages. Evidently, slightly over a third of the participants in the control condition, in an effort to remember as much as possible from the passages they read implemented their own strategy of looking for important information.

Another interesting finding was that 17.24% of the participants in the traditional/classroom training condition, 10% of the web-based training condition and 5% of the control condition mentioned on the free response question that they remembered more information from the passages they read after training. Other changes in reading and recall performance after the research session expressed by the participants included

that “they remembered the same amount of information,” “they believed they could organize the information they remembered from passages better,” that “they remembered more at the beginning because they got tired toward the end,” and that “they paid more attention to details” (see Table 11).

Another free response question on the Opinions questionnaire required participants to state what they liked about the training program). The frequencies and percentages for the answers given to this question are presented in Table 12. The results revealed that 26.08% of the participants in the traditional/classroom condition and 44.83% of participants in the web-based strategy condition mentioned that they liked that they learned what to focus on when reading. Additionally, 8.7% of the participants in the traditional/classroom training condition and 17.34% of the participants in the web-based training condition volunteered that they liked the materials because they were easy to follow. Another interesting opinion voiced by 26.08% of participants in the traditional/classroom training condition was that they appreciated the many examples and hands on exercises. Other opinions offered included that “the computerized materials were easy to follow,” “the in-depth discussion of ideas”, “the organized materials and the step-by-step instruction,” “the passages were interesting and informative,” “the materials were interesting,” and “the information on how to create web pages” (see Table 12).

Another free response question on the Opinions questionnaire required participants to state what they did not like about the training program. The frequencies and percentages for the answers given to this question are presented in Table 13. Interestingly, 61.54% of the participants in the traditional/classroom training condition and 59.26% of the participants in the web-based training condition who responded to this

question mentioned that there was nothing they did not like about the program. Another finding was that 19.23% of the participants in the traditional/classroom condition, 11.11% of those in the web-based training condition, and 7.14% of participants in the control condition volunteered that they did not like the passages because they found the topics boring and hard to understand. Additionally, 15.38% of the participants in the traditional/classroom training condition and 35.71% of participants in the control condition said that too much information was given. Other responses to this question were that “they did not like the computer materials, the video,” “computer materials were confusing,” “information was not interesting” and that they “did not like reading and writing” (see Table 13).

The last question on the Opinions questionnaire required participants to state what they would change about the training program. The frequencies and percentages for the free response answers given to this question are presented in Table 14. A great number of participants (43.48% of participants in the traditional/classroom condition, 51.85% of participants in the web-based training condition, and 15% of participants in the control condition) stated that they would shorten the training, have fewer passages, and make the training part less repetitive. Another 21.74% of the participants in the traditional/classroom training condition and 14.81% of participants in the web-based training condition mentioned that they would rather have passages on topics that interest college students. Other responses included “give more detailed instructions,” “require less writing,” “allow more time for computer training”, “have students choose the topic of the passages,” and “make the use of computers more interactive” (see Table 14).

Four of the 17 items on the Opinions about Training Questionnaire were free response questions. For nine of the remaining 13 questions participants were asked to circle either "Yes" or "No." The majority (more than 80%) of participants in the traditional/classroom training condition responded Yes to six (66.66%) of these nine questions. The majority (more than 80%) of participants in the web-based training condition responded Yes to five (55.55%) of the nine questions. Of the remaining four questions three requested participants to circle either "Yes," "Somewhat," or "No." None of the participants in the traditional/classroom training condition responded Yes to these questions, while most students in this condition responded Somewhat and a few responded No to these items. Of the participants in the web-based training condition more than 50% responded Yes to these three questions, with many of the remaining students responding Somewhat and only a few responding No to these three questions. However, these findings need to be interpreted with caution since the response "somewhat" on these three measures is difficult to interpret. That is, some of the participants may have perceived it as a positive statement, while others may have perceived it as a more negative statement.

Time Spent on Training.

The time spent by participants in the traditional as well as the web-based training session was examined. Participants in the traditional/classroom condition were asked to write down the time the experimenter started going over the training materials as well as the time they finished recalling the last passage/training exercise in their training package. Training times recorded were calculated in seconds. To keep track of the time taken by participants in the web-based condition to go over the training materials, two

on-line web-page tracking programs were used (Sitestats <http://www.sitestats.com> and Extreme Tracking <http://www.extremetracking.com>). Even though these two tracking programs were of limited capacity, they did provide basic information regarding the time spent on the training web pages. Again the time spent on the training web pages was calculated in seconds. A one-way Analysis of Variance revealed significant differences between the two treatment conditions on the total time spent on the training materials ($F(1,62) = 35.34$, $MS = 13234212$, $p < 0.005$). Participants in the traditional/classroom training condition needed on average 4962 seconds ($SD = 322$) to go over all the training materials. On the other hand participants in the web-based training condition spent considerably less time to go over all the training materials presented on-line; on average 4050 seconds ($SD = 782$).

The difference in the time spent by participants in the two conditions to go over the training materials might explain why participants in the web-based condition did not do better on most tasks compared to participants in the traditional/classroom training condition. Since participants in the web-based training condition had the opportunity to go over the training materials at their own pace, they skimmed over the materials, not paying the necessary attention to the information presented to them. Thus, their performance was not as good as expected. On the other hand, participants in the traditional/classroom training condition went over the training materials with the instructor. As a result they had to carefully read all the information presented in the materials, which led them to perform well on the two post-tests.

Differences Among the Three Conditions on Underlining Important Ideas in Recall Passages.

A MANOVA was calculated to investigate whether there were differences among the three conditions on the important ideas they underlined while reading the fast breeder reactors, trusts, and schizophrenia passages. Participants were instructed to underline no more than three important sentences in each passage while reading it. Participants responses were scored on the basis of whether participants underlined the sentence identifying the problem, one sentence identifying an additional problem, and the sentence presenting the solution. The results revealed differences among the three conditions (Wilks's Lambda = 0.82; $F(6, 174) = 2.88, p < 0.05$). Follow-up one-way ANOVAs were calculated to investigate differences among the three training conditions on underlining important information in the passages. The results showed significant differences among participants in the three experimental conditions on the information they underlined in the trusts passage ($F(2,90) = 4.39, MS = 5.45, p < 0.05$) and the same trend, but not significantly on the schizophrenia passage ($F(2,90) = 3.01, MS = 3.58, p = 0.054$). However, there was no significant difference on the fast breeder reactors ($F(2,90) = 0.49, MS = 0.71, p = 0.61$). Interestingly, participants in the web-based training condition performed significantly better on underlying important information in the trusts passage than those in the traditional/classroom condition (Tukey_a = 0.01) but not those in the control condition (Tukey_a = 0.82). There were no significant differences between participants in the traditional/classroom training condition and the control condition (Tukey_a = 0.11).

Number of Hits Per Web Page.

Since participants in the web-based position were able to work at their own pace, it would be interesting to know whether they looked at the web pages they had to study more than once. For this purpose the total number of hits per page was collected from the two on-line web-page tracking programs used in this research study (Sitstats and Extreme Tracking). The two web-page tracking programs only provided data for 24 and not all 35 participants in the web-based training condition. The total number of hits per page was divided by the number of participants in the web-based training condition ($N = 24$). The results indicated that many participants visited pages more than once (Table 15 presents the average number of hits per page).

Differences Among Conditions on Total Time Spent Reading the Experimental Passages.

The time taken to read each passage (pretest, post-test 1/schizophrenia, post-test 2) was first converted to seconds. Then, all three times were added together to get the total time it took participants to read all three passages. The total time values were entered into a one-way ANOVA to investigate differences among the three conditions in the total time it took to read the experimental passages. The results indicated significant differences among the three conditions ($F(2,77) = 4.47$, $MS = 182366$, $p < 0.01$). Participants in the traditional training (Tukey $\alpha = 0.01$) condition needed significantly less total time than participants in the control condition to read the three experimental passages (see Table 16 for means and SDs). Participants in the traditional/classroom training and in the web-based training condition did not differ significantly on the time needed to read the three passages (Tukey $\alpha = 0.66$). Participants in the web-based training

condition did not significantly differ to participants in the control condition on the total time needed to read the three passages (Tukey $\alpha = 0.08$).

A MANOVA was calculated to examine differences among the three experimental conditions on the time taken to read the pretest, the post-test1 (schizophrenia), and the post-test2 passage. The results revealed no significant differences among the three conditions (Wilks's Lambda = 0.86; $F(6, 150) = 1.95$, $p = 0.07$).

Table 1.

Mean and Standard Deviation Scores on Counterbalanced Pretest Passages' Total Recall, Recall of Main Ideas, and Use of Top-Level Structure

Passage	Total Recall		Main Ideas		Top-level Structure	
	Mean	SD	Mean	SD	Mean	SD
Trusts	30.96	12.02	20.54	7.91	4.67	2.92
Fast Breeder Reactors	27.98	14.77	20.82	9.70	6.29	2.84

Table 2.

Mean and Standard Deviation Scores on Pretest Passage Total Recall, Main Ideas, Top-Level Structure and Vocabulary Scores by Condition

Condition	Total Recall		Main Ideas		Top-level Structure	
	Mean	SD	Mean	SD	Mean	SD
Traditional/classroom training	28.73	14.13	20.18	9.45	5.12	3.23
Web-based training	29.37	10.57	31.40	7.42	6.11	2.80
Control	30.76	16.36	20.36	9.84	5.00	2.83

Condition	Vocabulary	
	Mean	SD
Traditional/classroom training	54.44	12.72
Web-based training	51.29	10.93
Control	56.12	8.33

Table 3.

Mean and Standard Deviation Scores on Schizophrenia Passage Total Recall, Recall of Main Ideas, and use of Top-Level Structure Scores by Condition

Condition	Total Recall		Main Ideas		Top-level Structure	
	Mean	SD	Mean	SD	Mean	SD
Traditional/classroom training n= 33	29.55	11.04	22.67	8.86	7.85	2.15
Web-based training n=35	25.09	9.89	19.94	7.78	7.29	2.29
Control n =24	22.48	9.74	18.09	8.67	5.08	2.46

Table 4.

Mean and Standard Deviation Scores on Far Transfer Task Total Recall, Recall of Main Ideas, and use of Top-Level Structure Scores by Condition

Condition	Total Recall		Main Ideas		Top-level Structure	
	Mean	SD	Mean	SD	Mean	SD
Traditional/classroom training n = 33	29.03	13.52	21.52	9.68	8.03	2.21
Web-based training n= 34	25.12	10.99	19.62	7.98	7.82	2.26
Control n= 24	26.72	14.65	18.88	9.45	5.84	2.83

Table 5.

Percent of Participants in the Three Experimental Condition Using the Top-Level Structure at Pretest, Post-test1, and Post-test2

Condition	Time of Test		
	<u>Pretest</u>	<u>Post-test 1</u> <u>Near</u> <u>Transfer</u>	<u>Post-test 2 Far</u> <u>Transfer</u>
Traditional/classroom training n = 33	58%	94%	94%
Web-based training n = 35	63%	71%	74%
Control Condition n= 24	50%	50%	50%

Table 6.

Mean and Standard Deviation Scores for Participants in the Traditional/Classroom and in the Web-Based Training on Near and Far Transfer Tasks

Transfer task	Traditional Training			Web Training		
	Total recall	Main ideas recalled	Use of top-level structure	Total recall	Main ideas recalled	Use of top-level structure
Near transfer	29.03 (2.14)	21.51 (1.54)	8.03 (0.40)	25.11 (2.11)	19.61 (1.52)	7.82 (0.38)
Far transfer	29.54 (1.83)	22.67 (1.46)	7.85 (0.34)	25.20 (1.80)	20.00 (1.44)	7.47 (0.36)

Table 7.

Mean and Standard Deviation Scores on Training Exercises Identification of Top-Level Structure and Identification of Signaling Words

Condition	Identification of top-level structure		Identification of signaling words	
	Mean	SD	Mean	SD
Traditional/classroom training n=32	13.50	0.80	15.48	2.15
Web-based training n=15	12.27	1.49	12.74	2.64

Table 8.

Mean and Standard Deviation Scores for Total Recall and Use of Top-Level Structure on the Rat Allergies and Treating Manic-Depressive Illness Training Passages.

Transfer task	Traditional/classroom Training		Web-based Training	
	Total recall	Use of top-level structure	Total recall	Use of top-level structure
Rat Allergies	31.44 (9.60)	7.72 (2.35)	32.00 (9.54)	8.26 (1.70)
	n=33		n=19	
Treating Manic-Depressive Illness	28.80 (8.83)	9.41 (1.60)	26.40 (8.75)	7.85 (2.25)
	n=34		n=20	

Table 9.

Percent of Participants in Each Experimental Condition Responding Yes or No to the First Nine Questions on the Attitude Questionnaire.

1. Do you feel you will remember more from your reading in everyday life than you did before this research study?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	93.75%	85.30%	24%
No	6.25%	14.70%	76%
$*\chi^2 (2, N = 91) = 38.57, p = 0.00$			
2. Do you feel you will remember more from your classroom readings than you did before this research study?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	81.25%	85.30%	28%
No	18.75%	14.70%	72%
$*\chi^2 (2, N = 91) = 25.69, p = 0.00$			
3. Do you feel that you remembered more after reading passages at the end in this session than you did at the beginning?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	84.85%	67.65%	36%
No	15.15%	32.35%	64%
$*\chi^2 (2, N = 92) = 15.10, p = 0.01$			
4. Has your interest in reading increased after this research session?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	24.24%	14.71%	4.16%

No	75.76%	85.29%	95.83%
$*\chi^2 (2, N = 91) = 4.32, p = 0.11$			

5. Has your enjoyment of reading increased after this research session?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	24.24%	14.71%	4.16%
No	75.76%	85.29%	95.83%
$*\chi^2 (2, N = 91) = 4.32, p = 0.11$			

6. Do you feel that you will remember different kind of information from your reading in everyday life after this research session?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	87.50%	88.24%	40%
No	12.50%	11.76%	60%
$*\chi^2 (2, N = 91) = 22.01, p = 0.00$			

7. Do you feel that you will remember different kind of information from your classroom readings after this research session?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	81.82%	91.18%	44%
No	18.18%	8.82%	56%
$*\chi^2 (2, N = 92) = 18.37, p = 0.00$			

8. When you read in this research session did you try to figure out how a passage was organized?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	90.91%	85.30%	72%
No	9.09%	14.70%	28%
$*\chi^2 (2, N = 92) = 3.83, p = 0.14$			

9. When you read in this research session did you try to evaluate your interest in a passage?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	63.64%	52.94%	80%
No	36.36%	47.06%	20%
$*\chi^2 (2, N = 92) = 4.59, p = 0.10$			

* Chi-square values not presented in Chapter 4, based on all three conditions.

Table 10.

Percentages of Responses on Opinions about Training Questionnaire for Questions 11- 14 Given by Participants in the Three Experimental Conditions.

Did you like the way the materials were presented?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	0.00%	51.61%	9.52%
Somewhat	85.71%	45.16%	42.86%
No	14.29%	3.23%	47.62%
$*\chi^2 (4, N = 80) = 38.51, p = 0.00$			
Did you find the materials interesting?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	0.00%	51.61%	28.57%
Somewhat	55.56%	38.71%	23.81%
No	44.44%	9.58%	47.62%
$*\chi^2 (4, N = 79) = 24.61, p = 0.00$			
What is your opinion about the ease of reading the materials you worked with in this session?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Difficult	7.14%	6.45%	61.90%
Normal Difficulty	57.86%	51.61%	33.33%
Easy	25.00%	41.94%	26.25%
$*\chi^2 (4, N = 80) = 31.50, p = 0.00$			
In the future, would you volunteer for similar research studies?	Traditional/ Classroom training	Web-based training	Control condition
	Percentage	Percentage	Percentage
Yes	0.00%	54.84%	28.57%
Maybe	85.71%	41.94%	42.86%
No	14.29%	3.23%	28.57%

$$*\chi^2 (4, N = 80) = 27.21, p = 0.00$$

* Chi-square values not presented in Chapter 4, based on all three conditions.

Table 11.

Frequency Count and Percentages on Opinions About Training
 Questionnaire Question 10: What in your Point of View were the Changes
 in your Reading and Recall After the Research Session?

Condition	Traditional/ Classroom training	Web-based training	Control Condition
	Frequency count	Frequency count	Frequency count
Read with more attention to author's plan.	17 (58.62%)	14 (46.67%)	2 (10%)
Looked for main ideas.	1 (3.45%)	3 (10%)	7 (35%)
Remembered more after training.	5 (17.24%)	3 (10%)	1 (5%)
Remembered same amount of information.	2 (6.90%)	4 (13.33%)	3 (15%)
Organized information in passages better.	3 (10.34%)	4 (13.33%)	2 (10%)
Remembered more at beginning/got bored and tired.	0	2 (6.67%)	3 (15%)
Paid more attention to details.	1 (3.45%)	0	2 (10%)

Table 12.

Frequency Count and Percentages on Opinions About Training
Questionnaire: What did you Like About the Training Program?

Condition	Traditional/ Classroom training	Web-based training	Control Condition
	Frequency count	Frequency count	Frequency count
Learned what to focus on when reading	6 (26.08%)	13 (44.83%)	1 (5.88%)
Computerized materials were easy to follow	0	5 (17.34%)	7 (41.76%)
Easy to follow materials	2 (8.70%)	5 (17.34%)	1 (5.88%)
Many examples and hands on exercises	6 (26.08%)	0	2 (11.76%)
In depth discussion of ideas	4 (17.40%)	1 (3.45%)	0
Organized materials and step-by-step instruction	2 (8.70%)	3 (10.34%)	0
Passages were interesting and informative	0	2 (6.90%)	3 (17.65%)
Interesting materials	3 (13.04%)	0	1 (5.88%)
Information on creating web pages	0	0	2 (11.76%)

Table 13.

Frequency Count and Percentages on Opinions About Training
Questionnaire Free Response Question: What did you Not Like
About the Training Program?

Condition	Traditional/ Classroom training	Web-based training	Control Condition
	Frequency count	Frequency count	Frequency count
Nothing	16 (61.54%)	16 (59.26%)	2 (7.14%)
Boring and hard to understand passage topics	5 (19.23)	3 (11.11%)	2 (7.14%)
Too much information	4 (15.38%)	0	10 (35.71%)
Did not like computer materials	0	3 (11.11%)	1 (3.70%)
Video	0	4 (14.81%)	0
Computer materials were confusing	0	0	10 (35.71%)
Information was not interesting	0	0	3 (10.71%)
Reading and writing	1 (3.84%)	1 (3.70%)	0

Table 14.

Frequency Count and Percentages on Opinions About Training
 Questionnaire Free Response Question: Is There Something
 About the Program you Would Change?

Condition	Traditional/ Classroom training	Web-based training	Control condition
	Frequency count	Frequency count	Frequency count
Shorten training	10 (43.48%)	14 (51.85%)	3 (15%)
More detailed materials and instructions	0	2 (7.41%)	13 (65%)
Nothing	7 (30.43%)	4 (14.81%)	1 (5%)
Have passages that interest college students	5 (21.74%)	4 (14.81%)	2 (10%)
Less writing	1 (4.35%)	0	0
More time for computer training	0	0	1 (5%)
Have students choose the topic of the passages	0	1 (3.70%)	0
Make use of computers more interactive	0	2 (7.41%)	0

Table 15.

Total Number and Average Number of Hits per Web Page from
Participants in Web-Based Training Condition.

Web-page	Total number of hits	Average number of hits
training/1	51	2.13
page2	45	1.88
page3	42	1.75
page4	46	1.92
page5	58	2.42
page6	56	2.33
page7	45	1.88
page8	55	2.29
page9	51	2.13
page10	38	1.58
page11	37	1.54
page12	39	1.63
page13	39	1.63
page14	39	1.63
page15	42	1.75
page15b	44	1.83
page16	49	2.04
page17	54	2.25
page18	59	2.46
page19	61	2.54
page20	46	1.92
page21	45	1.88
page22	48	2.00
page23	48	2.00
page24	40	1.67
Problem/solution	41	1.71

Table 16.

Means and Standard Deviations in Seconds for Time Needed to Read Experimental Passages

Variables	Mean			SD			F
	Traditional Training	Web Training	Control	Traditional Training	Web Training	Control	
Pretest	245.60	271.20	331.92	66.02	108.44	109.35	5.52**
Post-test 1 (Schizophrenia)	259.40	275.60	321.10	117.60	129.30	133.50	1.71
Post-test 2	230.50	237.20	249.00	92.80	105.10	120.60	0.21
Total time across passages	740.00	786.50	909.40	140.20	212.60	246.20	4.47*

* F significant at 0.05 level

**F significant at 0.01 level

CHAPTER 5

DISCUSSION

Some of the hypotheses in this research study were supported by the data, while some were not. The structure strategy training (traditional/classroom training as well as web-based training) was effective in teaching participants the problem/solution structure. Overall, the findings indicated that participants trained to use the problem/solution structure transferred their knowledge to help them organize their recall of new passages.

The first hypothesis stated that participants receiving problem/solution structure instruction in the web-based and in the traditional/classroom training conditions would have higher total recall scores, main idea scores, and top-level structure scores than participants in the control training condition on the near transfer passage and on the far transfer passage. The results partially supported this hypothesis. Participants in the traditional/classroom training condition outperformed participants in the control condition in their total recall of information from the near transfer passage. However, participants in the web-based training condition did not recall more information than those in the control condition. Additionally, participants in the two structure strategy training conditions did not recall more main ideas than participants in the control condition. The results did indicate that trained students increased their use of the problem and solution top-level structure as a result of structure strategy training, supportive to the hypothesis. Participants in the two structure strategy training conditions outperformed participants in the control condition on this measure. Thus, structure strategy training was effective in enabling participants to identify, transfer, and use the problem and solution structure to better organize their recalls. Instruction with the problem and solution

structure significantly increased the use of this strategy but did not substantially increase the number of main ideas remembered. The finding that participants in the web-based training condition did not have better recalls than participants in the control condition did not necessarily mean that use of the top-level structure did not help participants recall information. On the contrary, use of the top-level structure helped participants in the traditional/classroom and in the web-based training condition better organize their recalls and helped participants in the traditional/classroom condition increase their total recall. A possible explanation for lack of differences among the training conditions for main ideas may be that participants in the control condition may have come up with their own strategy of looking for important information. Participants in the control condition volunteered in the Opinions about Training Questionnaire that when reading the passages during the research session they looked for main ideas. Thus, using an alternative strategy may have helped participants in the control condition recall similar amounts of the main ideas to participants in the structure strategy training conditions. It is important to take into consideration that 50% of the participants in the control condition did exhibit use of the structure strategy on the pretest task and on the post-test 1 and post-test 2 tasks. This indicates that half of the participants in the control condition used the structure of the text throughout the research session to facilitate their performance on the recall tasks. According to Meyer and Poon (2001), some readers who predominantly use a list strategy, treating information in a passage as a list of facts to be learned, may switch their strategy to the structure strategy when signals indicate how the passage is organized. In the present study it is likely that the presence of signaling words in the pretest, pos-test 1,

and post-test 2 passages cued many participants in the control condition to using the correct structure for organizing the information they remembered from the passages.

The classroom/traditional training group may have better learned and consolidated their understanding of the structure strategy than the web-based training group since the classroom training group showed clear superiority to the control group in both organization of recall and ability to use this organization to increase the amount of information remembered while the web-based training group only surpassed the control group in organization of recall. Differences in the depth of learning the structure strategy may have resulted from more superficial processing by the students in the web-based program who spent an average of about 15 minutes less time studying the training materials than participants in the classroom training condition. Unfortunately the flexibility allowed individual learners to set their own pace for learning the materials did not promote optimal learning.

For the far transfer passage, participants in the traditional/classroom training and in the web-based training outperformed participants in the control condition on the use of the top-level structure measure. Again, this indicated that participants who were taught to use the problem and solution structure transferred this knowledge to help them better organize their recall of the far transfer passage. Overall, most students in the two training conditions made progress in learning and transferring the problem and solution structure. However, training in the use of the problem/solution structure did not help them recall more information than the control condition from the far transfer passage. Once more, it is likely that participants in the control condition focused on searching for main ideas in the far transfer task. This alternative strategy may have helped them improve their recalls.

The use of the passage structure by half of the participants in the control condition indicates that they were using the structure strategy even without specific training. That is very likely the reason why they did manage to recall as much information as the two training conditions.

Overall, the findings in regard to the first hypothesis are encouraging, indicating that computer-based instruction may result in transferable knowledge and skills (Fix & Wiedenbeck, 1996; Taylor et al., 1999; Yamamoto & Miya, 1999). However, in agreement with Fix and Wiedenbeck, 1996, transfer does not always occur when computers are implemented in instruction. Therefore, more information and more in-depth research is needed about their interaction with human learners and the ways that interaction can be manipulated to facilitate the creation of flexible, transferable knowledge (Greenfield et al., 1996; Taylor et al., 1999; Yamamoto & Miya, 1999).

In examining the interaction between training condition and transfer task it was expected that participants in the two conditions would do equally well on the near transfer passage but that on the far transfer task participants in the web-based training condition would outperform participants in the traditional/classroom training condition on the measures of total recall, recall of main ideas, and use of the top-level structure. This hypothesis was not supported by the data. The expected superiority on total recall, recall of main ideas, and top-level structure was not found for the web-based condition over the traditional/classroom training condition. Participants in the web-based training condition did not outperform participants in the traditional/classroom training condition; any differences on these dependent measures between the two conditions for teaching the structure strategy were not statistically significant on either the near or far transfer tests.

This lack of significant differences leads to the conclusion that web-based training was not better than traditional/classroom training. This is an important conclusion, since web-based instruction is becoming an emerging tool in teaching learners from all over the world.

The difference in the time spent by participants in the two conditions to go over the training materials might explain why participants in the web-based condition did not do better on most tasks compared to participants in the traditional/classroom training condition. Since participants in the web-based training condition had the opportunity to go over the training materials at their own pace, they skimmed over the materials, not paying the necessary attention to the information presented to them. Thus, their performance was not as good as expected. On the other hand, participants in the traditional/classroom training condition went over the training materials with the instructor. As a result they had to carefully read all the information presented in the materials, which led them to perform well on the two post-tests. This finding contradicts the theory that learners who set their own pace while studying are more likely to actively learn the material and to create knowledge that is flexible and thus particularly transferable across a variety of tasks (Greenfield, Camaioni et al., 1996; Greenfield, Brannon, & Lohr, 1996; Taylor et al., 1999; Yamamoto & Miya, 1999). It appears that participants in the present study were not sufficiently motivated to perform well on the tasks. Even though participants were aware that they would not be allowed to leave prior to the end of the session and that they would have to work with the instructional materials, they did not show the expected interest in studying the on-line materials. A likely explanation is that since their performance on the training materials was not linked

to something they valued, such as classroom grades as a form of external motivation, they chose to do the minimum work required. Since participants were not motivated they were less likely to put effort and to attend to and to work towards successfully learning the training materials. As a result, they were not as successful as expected with their learning and performance on the subsequent tasks.

It is important to keep in mind the findings regarding the time spent on the training materials. Participants in the web-based training condition spent significantly less time working on the training materials than participants in the traditional/classroom training condition. One plausible assumption is that learners in the web-based training condition skimmed over the training materials without paying adequate attention to the information to-be-learned. Participants in the web-based training may not have monitored their learning very well nor made optimal use of their allotted time. This may have caused the worse than expected findings on the dependent measures related to text recall. Thus, their performances on the total recall and recall of main ideas measures, as well as their use of the top-level structure, were not as good as expected. It is therefore necessary to come up with a way that will enable learners to better monitor their learning in web-based environments. Intelligent tutors may be one attractive solution to this problem (Wijekumar & Meyer, in press; Graesser, in press; McNamara, in press). According to Baylor (1999) and Callear (1999), intelligent agents help manage students' learning, teach new information using multimedia techniques, and produce learning models. The implementation of intelligent tutors could also help diagnose learners' cognitive state based on initial performance at the same time accounting for motivation, attention, and students' learning preferences (Aimeur & Frasson, 1996; Siemer-Matravers, 1999).

Web-based training can sometimes and under certain situations facilitate learning and transfer in a way similar to traditional/classroom instruction. Thus web-based training could under certain conditions substitute for traditional/classroom training when necessary and appropriate. Web-based training could for example be implemented when teaching general learning skills or strategies or supplementary knowledge. However, great caution would be needed since learners might not pay adequate attention to or not understand the information to-be learned, thus resulting in misunderstandings or misconceptions. Thus, to obtain optimal results web-based learning should be used in combination with other teaching techniques and not on its own. Additionally, it is important when using web-based training materials to have someone monitor or tutor learners on-line (e.g., Meyer et al., 2002). Furthermore, more examples and more immediate as well as delayed feedback might be needed in web-based training environments as opposed to traditional/classroom so as to make learners more aware of what they are being taught. Moreover, it is important to motivate learners in order for them to actively engage in learning with the use of computers.

An interesting finding in this investigation was that traditional/classroom training participants were better at identifying the correct top-level structure and signaling words in the training exercises. This finding might be the effect of the lack of attention during training by participants in the web-based training condition. On the other hand, participants in the traditional/classroom training condition were to some extent forced to pay attention to the training materials by the classroom instructor. As a result they were better able to find signaling words and to identify the correct top-level structure in the training exercises.

Participants' attitudes toward training were overall positive. The majority of participants in the two training conditions believed that they would be able to remember more from their daily life after their participation in the research session and that they would be able to remember more from their classroom readings. Interestingly, participants in the two training conditions felt that training with the problem/solution structure improved their recall of text information. Additionally, participants receiving training with the problem/solution structure felt they would be able to remember different kind of information from their everyday and classroom readings after the research session. Participants in the two training conditions also reported that they tried to figure out how the passages they read at the research session were organized. However, participants in both conditions did not feel that training with the problem/solution structure increased their interest, nor their enjoyment in reading. A suggested way to improve the materials and as a result participants' interest was to have passages with topics of interest to students, or at least have a variety of topics from which participants could choose. This might indeed help boost participants' interest and their attention in the training materials. Meyer and Wijekumar (in press) found some evidence that such choice of texts for practicing the structure strategy boosted motivation of fifth-grade students and increased their text recall after learning the comparison structure with an on-line intelligent tutor. Aimeur and Frasson (1996) argued that it is necessary to increase the degree of stimulation and to anchor the knowledge in the learner. One way to increase learners' motivation is by providing learners with a rich source of domain representations, thus allowing them to select and exploit the ones with which they feel most familiar or the ones that interest them most.

Another interesting finding was that participants in the web-based training liked the way the materials were presented while participants in the traditional/classroom training condition reported that they somewhat liked the way the materials were presented. Even though the content of the materials was identical in the two conditions, presenting the materials on-line with cartoons and color seemed to be more attractive for participants as opposed to a paper-and-pencil, black and white presentation. This also seemed to affect participants' interest since participants in the web-based training condition reported that they found the materials interesting while participants in the traditional/classroom training condition found the materials somewhat interesting or not at all interesting. However, participants' perceptions of interest of the materials did not relate to their ratings as to the difficulty of the reading materials. Most participants from both conditions mentioned that they thought the materials were of normal difficulty or easy. On the contrary, interest may have affected participants' willingness in participating in similar research studies in the future with participants in the web-based training reporting that they would definitely like to participate in similar studies in the future while participants in the traditional/classroom training condition reported that they might participate in similar studies in the future.

A very important finding from studying participants' responses to the opinions questionnaire was the reported tendency of participants in the control condition to look for main ideas and important information while reading the pretest, post-test1, and post-test 2 tasks. The tendency to look for main ideas in conjunction with the finding that participants in the control condition underlined the same kind of information in the three experimental tasks justifies to some extent the lack of differences for recall of main ideas

in post-test1 and post-test 2. Developing and using their own strategy for learning and remembering information from text may have provided adequate processing of main ideas by participants in the control condition, thus eliminating the effects of training with the structure strategy on recall of main ideas.

The above findings indicate that participants in the two training condition had mostly positive viewpoints about the research session. They seemed to believe that the training they received with the problem and solution structure would help them not only with their classroom readings but also in their everyday life. It would be of great interest to examine whether these students actually tried to use the problem and solution structure in their everyday life or in their classroom readings. Another important finding was that participants perceived the materials as more interesting and considerably easier when they were presented on-line with cartoons and in color as opposed to a paper-and-pencil presentation. Given that the materials were identical as to the content and difficulty level, it appears that either surface features such as cartoons or the fact that these materials were presented on-line, a way of presentation college students are quite familiar with, made them seem easier to the participants. However, it could be students' perception of the easier nature of the materials led to them skimming over some of the examples and instructions resulting in less time on task and less accurate responses than students in the classroom condition. More research is needed in this area to determine whether it is simply presenting materials on-line or the use of cartoons or the combination of the two that seems to make them more interesting and easier to participants and the effects of these perceptions on student learning and performance.

Limitations of the Study.

There are several limitations of this study as observed by the researcher:

Due to computer problems or the lack of interest by participants in the web-based condition not all their responses from working on the web-based training materials were received by the instructor. Thus, on certain tasks the number of web-based training responses does not equal the number of participants in that condition. Thus, the sample size may not have been big enough to have adequate power to detect the possible interaction between learning conditions and training with the structure strategy.

Another limitation was that there was only immediate post-test data collected in the study. Even though the post-test 2/far transfer task took place after a buffer task, it did not take place very long after the training with the problem and solution structure. Without a delayed post-test (e.g., one week later) there is no way of knowing whether use of the top-level structure would be retained and transferred after some time.

A third limitation was one instructional session combined with testing. It is possible that one training session with the problem and solution structure is too short for students to master this strategy and to observe the effects of web-based and traditional/classroom training. A longer training period might be necessary to detect the differential effects of web-based and traditional/classroom training with the problem/solution structure. Most of the past training studies with college students learning the structure strategy for five text structures have involved 90 minutes of instruction a day for five to six days spread over two or three weeks with additional homework assignments (e.g., Meyer et al. 1989; Meyer & Poon, 2001).

Similarly, training with just one text structure (problem/solution) may not be adequate for detecting differences in the effects of web-based and traditional/classroom training. Training with all five structures identified by Meyer (1975, 1985) may be necessary in order to detect differences between web-based and traditional/classroom instruction.

Implications for Educators and Learners.

The goal of this research was to investigate the differential effects of web-based and traditional/classroom training with the problem and solution text structure on college students' transfer and recall of text information. The study suggests that web-based training has a potential of being used as an effective tool in teaching a strategy for learning and remembering text information. A more important question actually is how to better integrate web-based instruction into classroom and formal curriculum. The following questions need to be addressed in future research.

1. When and how it will be appropriate to implement web-based or computer-based instruction into the classroom environment?
2. What kinds of knowledge are best taught via computers and which kinds should be taught in classroom?
3. Under what circumstances will web-based training be successful or unsuccessful?
4. How can educators successfully implement web-based instruction in classroom, under what circumstances, and to what extend?
5. How will educators successfully design their own web-based instructional materials to accommodate their students' needs?

6. How can intelligent tutoring agents be successfully implemented in classroom web-based environments?

Future Research.

The present research has revealed several areas of research for future investigation. It would be of great interest to investigate web-based training as opposed to traditional/classroom training with all the structures (problem/solution, cause/effect, comparison, description, and sequence) identified by Meyer (1975, 1985) and not just with problem/solution. This would provide better understanding as to the effects of web-based instruction on training learners in the use of reading strategies and on transfer. Questions that might be addressed in such a study include: (a) Does web-based training result in the creation of solid knowledge structures for each structure taught? (b) Are the knowledge structures formed transferable to reading and recalling novel passages? (c) Does web-based instruction allow learners to successfully distinguish among the five knowledge structures?

A second area of investigation in the future would be to compare traditional/classroom training, web-based training, and a combination of traditional/classroom and web-based training. Since web-based training did not enhance participants' performances to the degree that was expected in this study, a combination of the two training methods might enable learners to improve their performance.

A third line of future research is to investigate the effects of web-based versus traditional/classroom training on retention and transfer of the structure strategy over time (after a week, a month, three months) and on a variety of reading tasks (e.g., writing an essay or a classroom report, recalling information from on-line passages, from web-

pages). Web-based training participants in this study performed adequately on the two transfer tasks. Web-based training is emerging as a teaching tool all over the world. However, it is of interest to know whether it has lasting results on performance over time. Thus, future research should examine whether training learners on-line would result in retainable knowledge over a long period of time. Additionally, it would be interesting to investigate the effects of traditional/classroom as well as web-based training on a variety of reading tasks. It is widely accepted (e.g., Meyer et al., 1989; Meyer & Poon, 2001) that training with the structure strategy enables learners to organize their recall of text information. However, the following questions need to be addressed: (a) Does training with the structure strategy (web-based and traditional/classroom) facilitate recall of information presented on-line? (b) Does training with the structure strategy (web-based and traditional/classroom) transfer to writing tasks, such as writing an essay or a classroom assignment?

One interesting finding in this research study was that participants found the web-based materials more interesting and thought them as easier than the paper-and-pencil materials given to the traditional/classroom training condition. Given that the materials were identical as to the content and difficulty level, it appears that either surface features such as cartoons or the fact that these materials were presented on-line, a way of presentation college students are quite familiar with, made them seem easier to the participants. More research is needed in this area to determine whether it is simply presenting materials on-line or the use of cartoons or the combination of the two that seems to make them more interesting and easier to participants.

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APPENDIX A. GENERAL READING INSTRUCTIONS

GENERAL READING INSTRUCTIONS

Welcome! We appreciate your participation in this study. Today we are calling on you to do some hard work involving reading and remembering. We will be looking at the type and amount of information people remember after reading articles.

Today you will be reading information that originally appeared in magazines, pamphlets, or textbooks; that is, the information has been stated before as factual (we did not make it up although some people might not agree with all the ideas presented!) Please read the articles as you would normally read an article you were interested in and wanted to remember. You can look back at other sections of the article you are reading if you would normally do so while reading. However, do not read the article over and over again trying to memorize it. Instead, just read it as you normally would when trying to understand and remember what you read. After you have finished reading an article and recording the time, please turn to the next page and follow the instructions provided.

Today you will read two short articles and then write what you remember from them. Please read the articles as you would normally read an article you wanted to remember. This is not a timed test, but we do want to know how long it takes you to read our articles. Before you begin reading write the hour, minutes, and seconds in the blank identified at the beginning of the article as Time: _____.

For example, if you see 6:33 PM and 14 seconds, please write 6:33:14 on the line. Then, at the end of the article you will see another Time: _____. Write whatever time now appears on the same clock. Again, do not hurry.

After you have finished reading each article, please rip it out of the booklet and put it in the envelope provided to hide it from view before writing what you remember.

You will read three articles, one prior you receive some training and two after the training. After reading the articles we will ask you to write down everything you can remember from the article. We want to see how many ideas you remember and if you remember how the ideas were interrelated so please write in sentences and paragraphs, rather than listing words. You can use the words in the passage or your own words. If you can recall an isolated idea, such as "octopus," but cannot remember how it was related to anything else in the passage, please write "I remember reading 'octopus', but I cannot remember its connection." Write down everything you can remember.

We hope you will somewhat enjoy these passages; your work is valuable to our research program! Thank you again for your assistance.

APPENDIX B. TRADITIONAL/CLASSROOM CONDITION TRAINING
MATERIALS

 Student name

STUDENT'S TRAINING PROGRAM

Goal of training: To increase your memory of what you read by using the structure in reading materials.

Please circle the answer that applies to you: Do you want to improve your ability to remember what you read?

1	2	3	4	5	6	7
not at all	don't care	maybe	I have no feeling one way or the other	yes, some	yes, lots	I would work very hard to improve this ability.

1. Objectives:

FOR YOU:

- a. Improve your learning and your memory by identifying and using an organizational plan in reading materials.

FOR US:

- b. Refine previous approaches to teaching the "Plan Method" with college students.

Research on the plan or structure strategy over the past several decades indicates that with practice learners can use the plan strategy effectively and increase the amount of written information they can remember. One of the main findings in previous studies was that for all age groups successful readers employ a deliberate plan or strategy for remembering what they read. Successful readers identify and utilize the writing plan used in their reading materials; they use this plan to help them remember what they have read

when they discuss the information with others or write down what they remember about their reading. In this program you will learn how to use this strategy for reading and remembering.

Another important finding is that with practice learners of all ages can use this strategy effectively and increase the amount of information they can remember. In other words, when it comes to reading comprehension skill, it is "Use it or lose it."

All participants will be able to increase the amount of information remembered from reading materials after this instruction. Not only will the amount of information be increased, but this strategy will help you to identify and remember the most important information you read. We appreciate your participation and hard work in this program, and we expect that you will achieve important personal benefits.

2. Introduction to Training Program

Aim 1: To establish a rationale for using the reading strategy.

During this session I will show you a way to increase this ability to get information from what you read. This will involve using a strategy, deliberate plan, for remembering. Our strategy involves two steps. In reading, we find the organizational plan used by the writer. In remembering, we use the same organizational plan. This is a strategy to improve memory. The strategy is called using the plan.

We have taught others to use this strategy. A trained group of readers could remember twice as much information from their reading materials after instruction (both 1 day and 3 weeks after) than they could before; and they outperformed an untrained group by twice the amount recalled. Moreover, readers in both groups who found and used the author's plan remembered more information from texts than those who did not find the plan.

Aim 2: To specify learning and teaching tasks of the program.

Communication. Your job will be to listen attentively to the ways in which this strategy for remembering is applied to reading, to apply it to reading materials, and, after you leave, to apply it to your own reading. My job will be to show you how to use the strategy and to check on your efficiency in using it.

3. Principles:

Communication. We know five facts about reading for information.

- 1) The writer wants to tell you something.
- 2) You must be told in writing.
- 3) There are only a small number of possible plans in which to organize information about a topic.
- 4) The writer should organize his or her main ideas about a topic with a plan.
- 5) To find this organizational plan is the key to getting the writer's main ideas or message.

You will want to use this strategy when you want to remember what the writer is trying to tell you. You will not want to use the strategy when you are reading for the purpose of finding a particular fact.

Let's try an exercise together

Fill in the blanks as we go through the exercise together

1. A strategy for remembering what I read has two steps. In reading, I will

_____.

In remembering, I will _____.

2. This strategy is called Using _____.

Program Objectives: To improve recall by identifying and using the writing plans in reading materials.

In order to use a plan for reading and remembering text, it will be helpful to learn about five commonly used plans in reading materials. The five plans are designated as follows: Description, sequence, causation (cause/effect), problem/solution, and comparison.

Listing (or collection) can be used along with any of these plans.

During this session you will learn about one of these five plans called problem/solution. **The problem/solution structure was selected for training because of its importance and use in college and everyday life. The problem/solution structure is widely used in scientific journals, research reports in magazines, and medical information.** Table 1 describes the problem/solution plan and signals that can cue you into this plan.

Table 1

Problem/Solution Plan and Signals that Cue Readers to this Plan

Writing Plan & Definition	Signals
<p data-bbox="396 415 618 449" style="text-align: center;"><u>Problem/solution</u></p> <p data-bbox="237 470 773 940">The main ideas are organized into two parts: a <u>problem</u> part and a <u>solution</u> part that responds to the problem by trying to eliminate it, or a <u>question</u> part and an <u>answer</u> part that responds to the question by trying to answer it. e.g., scientific articles often first raise a question or problem and then seek to give an answer or solution.</p>	<p data-bbox="802 415 1321 562"><u>Problem:</u> problem, question, puzzle, perplexity, enigma, riddle, issue, need to prevent, trouble,* _____</p> <p data-bbox="802 596 1321 667">_____</p> <p data-bbox="802 688 1321 890"><u>Solution:</u> solution, answer, response, reply, rejoinder, return, comeback, to satisfy the problem, to set the issue at rest, to solve problems,</p> <p data-bbox="802 911 1321 940">* _____</p> <p data-bbox="802 982 1321 1012">_____</p> <p data-bbox="802 1033 1321 1062">_____</p>

*** Please add more signaling words in the space provided in the table from the practice passages and exercises you will work on today.**

THE PROBLEM/SOLUTION PLAN

The problem/solution plan has two parts, a problem part and a solution part; the solution part has to respond to the ideas in the problem part. This plan also has a question/answer form; here a question is raised in one part and in the other part an answer is given to the question. Scientific articles often adhere to the problem/solution or question/answer plan, first raising a problem or a question and then seeking to give a solution or answer.

The first example of this plan in the following advertisement uses the question and answer format.

Example

YOUR SHISH KABOBS LOOK SO TANTALIZING. SHOULD YOUR GLASSES BE SPOTTY? GET THE CASCADE LOOK...VIRTUALLY SPOTLESS.

The details of this advertisement expand on the question and the answer segments of this plan. The first paragraph below from this advertisement repeats and expands on the question that appeared in the bold face title of the advertisement; the second paragraph explains why Cascade is the solution to the spotty glass problem.

"Your guests will rave when they see this dish. But what about your glasses? You don't want spots at a time like this, or anytime. (Here the question is answered "NO" and the problem of spots emphasized.)"

"The spotty glass shows that plain water alone can leave dulling spots. (Here we see that the problem of spots is caused by plain ordinary water.) So it's good to know that Cascade's sheeting action fights drops that spot...gives your guests glasses with the Cascade look! (Here Cascade is identified as the suggested solution because it fights water drops.)"

Better Homes and Gardens has run a feature entitled "Tips, Tools, and Techniques" that explicitly signals the problem/solution plan to its readers. The next example was taken from this column.

Example

"PROBLEM: After you've waxed the car, dried residue lingers around the grill.

SOLUTION: A flagged-tip nylon paintbrush will remove the polish from crevices without scratching the paint (H. G., Springville, Tenn.)."

Our strategy for reading and remembering will focus on the overall plan used in the text rather than plans used to organize details in a text. You can use this information in your everyday activities. What we want you to do is to get into the habit of identifying how information is organized and then using that organization to help you remember the important information. Signaling words can cue you into that plan used by an author to organize his or her main ideas. Remember that we are looking for the overall writing plan that organizes all the information presented; signals will probably be found for plans that organize just parts of the information too, but we will focus on the plan that organizes all of the information into a whole. The information organized by this overall plan is the main idea the author is trying to tell you. Go through Table 1 to review the problem/solution plan and read the signals listed for the plan. Spaces are provided in the Table for you to fill in signaling words that you discover in our work during this session.

Please read the advertisements below and determine the overall plan used to organize the information and identify any signaling words used for the overall plan. Write down the name of the plan for each advertisement and underline the signaling words. When you have finished, we will go over the plans for the advertisements as a group and discuss any disagreements or problems. Your options for answers are: the problem/solution plan, question/answer form of the problem/solution plan, or no plan.

Review Ad. #1

WANT A TOUGH STAIN OUT? SHOUT IT OUT!

Plan

Review Ad. #2

"WITH EIGHT BROTHERS AND SISTERS, BIRTHDAYS USED TO BE A PROBLEM." NOW I SEND THE BIRTHDAY PARTY BOUQUET FROM BY FTD FLORIST. IT'S MORE THAN A GIFT, IT'S A CELEBRATION.

Plan

We are focusing on the plan the author used to write the advertisement. Once you figure out what the author is telling you then you can evaluate his or her message. Remember this strategy is to be used when you want to remember a lot from your reading and you want to know what the author said. You probably would not use it when casually looking over the newspaper for enjoyment.

See if you can write an advertisement for your new invention, the safety pin, using the problem/solution plan. Write your advertisement below.



Look at the tiger picture. Now try to write about the picture using the problem/solution writing plan.

LET'S CHECK

For each of the passages:

- 1) **Underline** the signaling words that cue you into the author's plan.
- 2) **Write** the name of the plan used in the space provided. The options are *Problem/Solution*, *Question/Answer*, and *No Plan*.

1. Pollution is a problem for our rivers. Polluted rivers are eyesores. They are also health hazards. One solution is to stop the dumping of industrial waste.

_____ Plan

2. **Coping with Disaster: Tips for College Students**

(<http://www.nmha.org/reassurance/collegetips.cfm>)

For many college students, the horrific Sept. 11 terrorist attacks in New York City and Washington, D.C., mark the first major national catastrophe they have ever experienced.

In the aftermath of the attacks, students across the country may feel uncertain about a future they had just begun to carefully map out. Some may have suffered the loss of parents, relatives or friends. Others may wonder how our nation's response to the attacks will involve them. Nobody is unaffected.

- Here are some suggestions of how to cope with this problematic situation:
- Talk about it and encourage others to share their perspectives.
- Take care of yourself.
- Stay connected to friends and family.
- Make plans to visit family or other people who can offer reassurance.
- Do something positive that will help you gain a greater sense of control (for example, give blood, take a first aid class, or donate food or clothing).
- Ask for help if you feel overwhelmed by lingering thoughts about the disaster, it's not a sign of weakness.

Plan

3. **Attention Deficit Disorders** (Yoga Journal, December 2001, 164, p.96-103)

Attention Deficit Disorders (ADD) is one of the most common behavioral problems of childhood. ADD affects 3-9% of the school-age population. The most common symptoms associated with ADD include difficulty following directions and poor control over impulses.

It is essential for individuals with ADD to learn how to control their condition. Many health-care professionals today recommend a multidisciplinary approach for controlling ADD. This approach includes medication but also mind-body approaches, such as yoga. Even though medications alone can successfully control ADD for a short period, there is no evidence that they can be used over an extended period without side effects. Some experts now believe that for long term control of ADD a combination of medication and physical and mental discipline, such as yoga, may be the best approach. Yoga integrates both the body and mind and can help engage the attention system more readily than medication alone. It improves self-awareness, coordination, and physical fitness without competition, and it provides individuals with ADD with a reliable structure to engage their long-term interest.

Plan

4. **How Can Family and Friends Help the Depressed Person?**

http://www.mental-health-matters.com/articles/isyke_depress01.html

The most important thing anyone can do for the depressed person is to help him or her get an appropriate diagnosis and treatment. The second most important thing is to offer emotional support. Do not accuse the depressed person of faking illness or of laziness, or expect him or her "to snap out of it." Eventually, with treatment, most depressed people do get better. Keep that in mind, and keep reassuring the depressed person that, with time and help, he or she will feel better.

Plan

5. **Phobias and their treatment.**

http://www.mental-health-matters.com/articles/isyke_phobias01.html

Phobias are a problem for 1 in every 10 people. They are intense, irrational fears of certain things or situations (dogs, closed-in places, heights, escalators, tunnels, highway driving, water, flying, injuries involving blood, etc.). When phobias interfere with a person's life, it is necessary to seek treatment. There are three ways to treat phobias and the anxiety caused by them. These include medication, behavioral therapy such as diaphragmatic breathing, and cognitive-behavioral therapy, which teaches patients to react differently to the situations that trigger panic attacks and other anxiety symptoms.

Plan

6. **Bottled Water.** U.S. News & World Report, April 2, 1984, p. 80.

Is Bottled water healthier to drink than water from your tap? Not usually, says a chemist at Cornell Cooperative Extension. Unless you know that something is seriously wrong with your tap water, bottled water is probably no better for you.

Plan

7. **Post-traumatic stress disorder.**

http://www.mental-health-matters.com/articles/dw_ptsd01.html

Post-traumatic stress disorder is a serious mental health problem resulting in an extremely debilitating condition that can occur after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. Fortunately, effective treatments

have been developed to help people with post-traumatic stress disorder. These include cognitive-behavioral therapy, group therapy, and exposure therapy, in which the patient repeatedly relives the frightening experience under controlled conditions to help him or her work through the trauma, as well as medications that help ease the symptoms of depression and anxiety and help promote sleep.

Plan

8. **What is Bipolar Disorder?**

(http://www.mental-health-matters.com/articles/dw_bipolar01.html)

Bipolar disorder is also referred to as manic-depressive illness. It is a mental illness involving episodes of serious mania and depression. The individual's mood swings from overly "high" and irritable to sad and hopeless, and then back again, with periods of normal mood in between. Bipolar disorder typically begins in adolescence or early adulthood and continues throughout life. It is often not recognized as an illness, and people who have it may suffer needlessly for years.

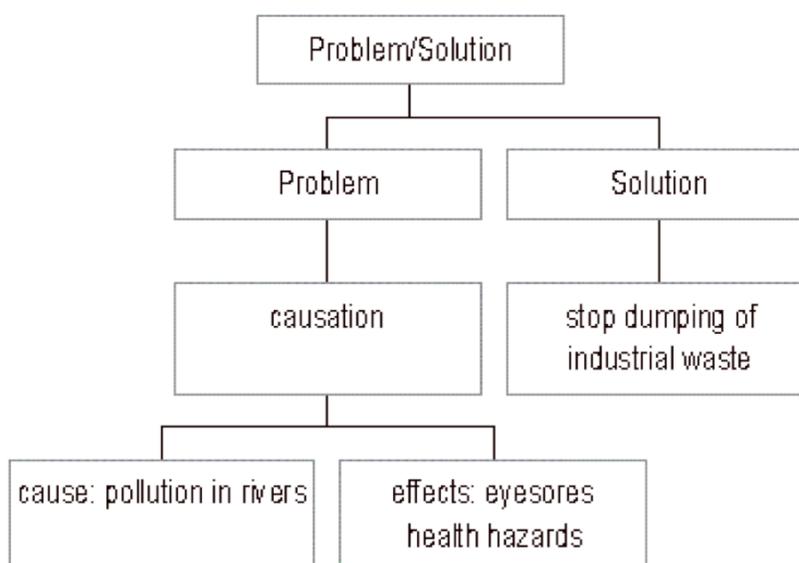
Plan

Feedback for short passages. Signaling words are in bold and underlined and top-level structures are shown with diagrams.

1. Pollution is a **problem** for our rivers. Polluted rivers are eyesores. They are also health **hazards**. One **solution** is to stop the dumping of industrial waste.

Problem/Solution Plan

Structure for Passage 1



2. Coping with Disaster: Tips for College Students

(<http://www.nmha.org/reassurance/collegetips.cfm>)

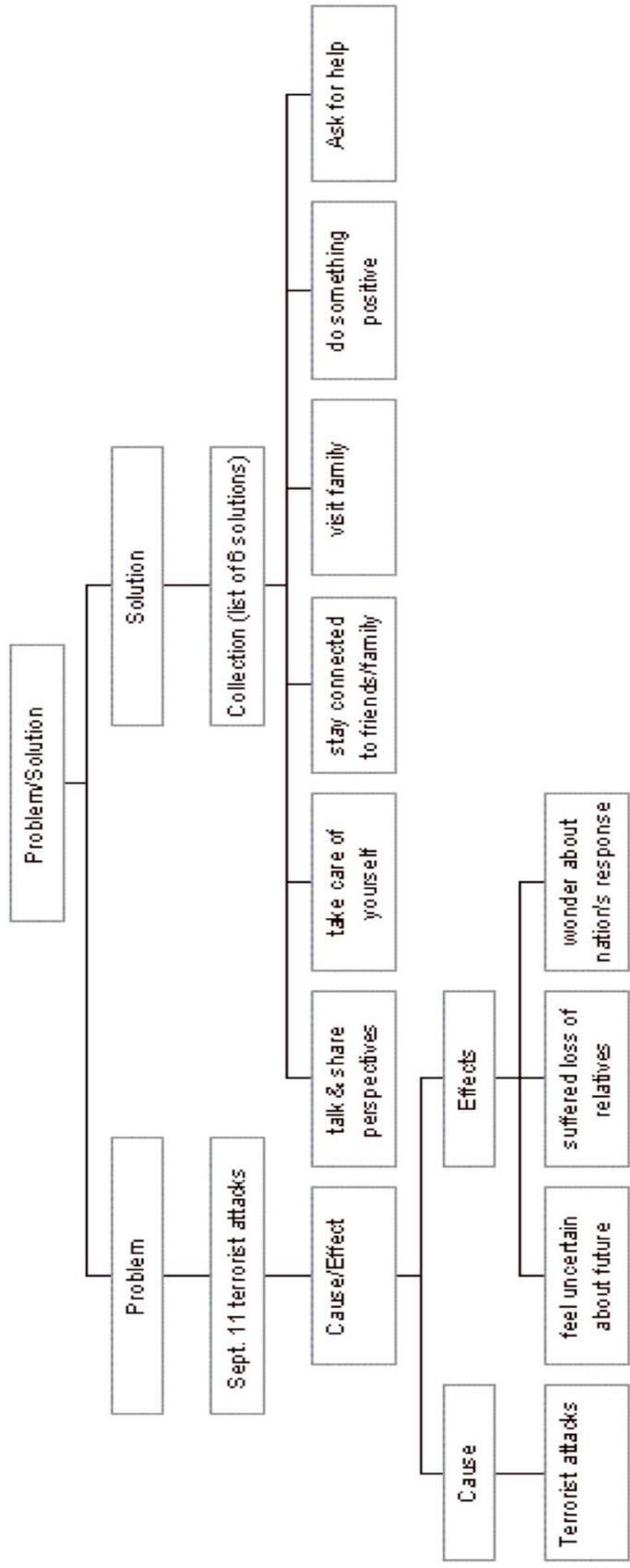
For many college students, the horrific Sept. 11 terrorist attacks in New York City and Washington, D.C., mark the first major national **catastrophe** they have ever experienced. In the aftermath of the attacks, students across the country may feel uncertain about a future they had just begun to carefully map out. Some may have suffered the loss of parents, relatives or friends. Others may wonder how our nation's response to the attacks will involve them. Nobody is unaffected.

Here are some **suggestions** of **how to cope** with this **problematic** situation:

- Talk about it and encourage others to share their perspectives.
- Take care of yourself.
- Stay connected to friends and family.
- Make plans to visit family or other people who can offer reassurance.
- Do something positive that will help you gain a greater sense of control (for example, give blood, take a first aid class, or donate food or clothing).
- Ask for help if you feel overwhelmed by lingering thoughts about the disaster, it's not a sign of weakness.

Problem/Solution Plan

Structure for Passage 2: Coping with Disaster



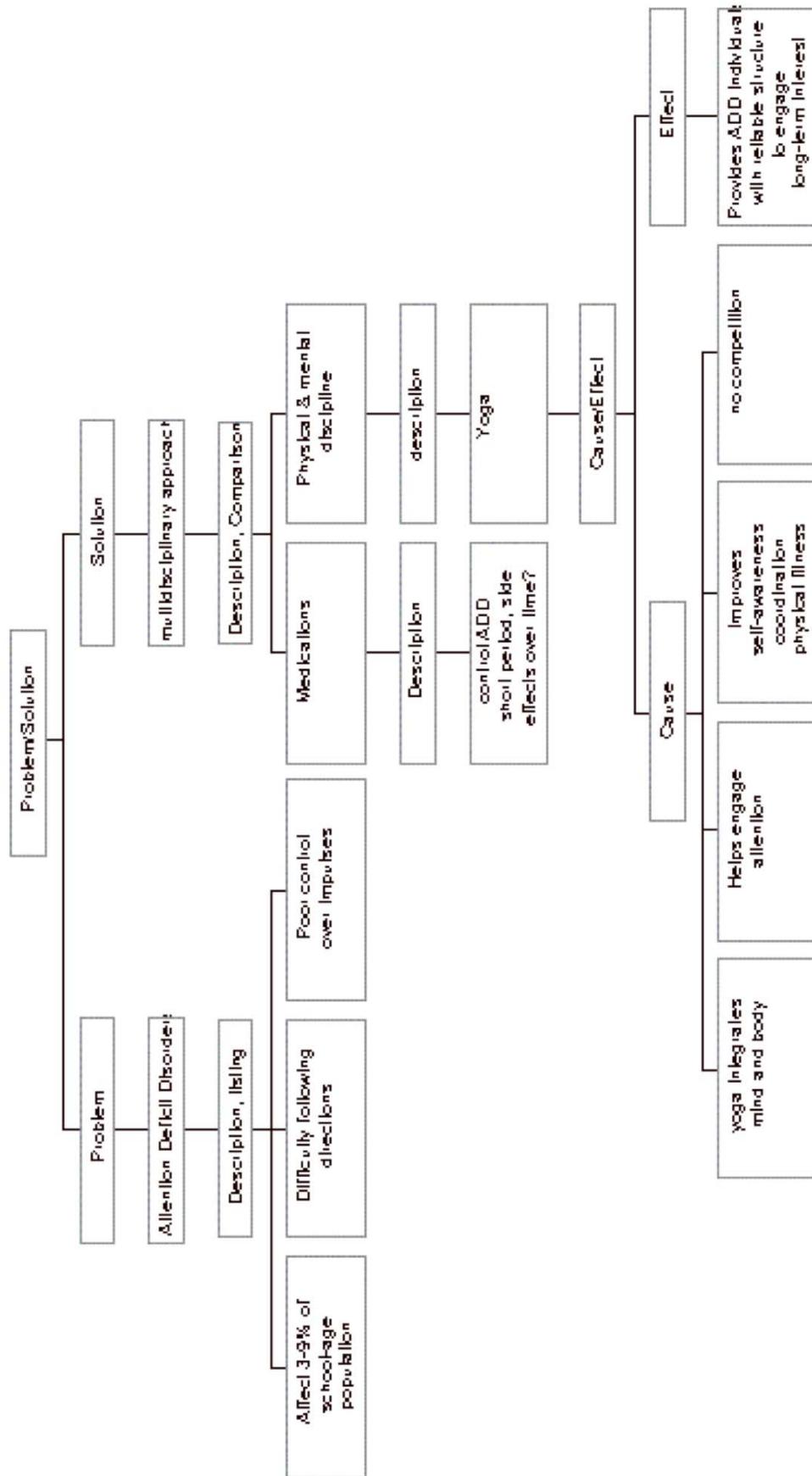
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It is essential for individuals with ADD to learn **how to control** their condition. Many health-care professionals today recommend a multidisciplinary **approach for controlling** ADD. This approach includes medication but also mind-body approaches, such as yoga. Even though medications alone can successfully control ADD for a short period, there is no evidence that they can be used over an extended period without side effects. Some experts now believe that for long term control of ADD a combination of medication and physical and mental discipline, such as yoga, may be the best **approach**. Yoga integrates both the body and mind and can help engage the attention system more readily than medication alone. It improves self-awareness, coordination, and physical fitness without competition, and it provides individuals with ADD with a reliable structure to engage their long-term interest.

Problem/Solution Plan

Structure for Passage 3: Attention Deficit Disorders



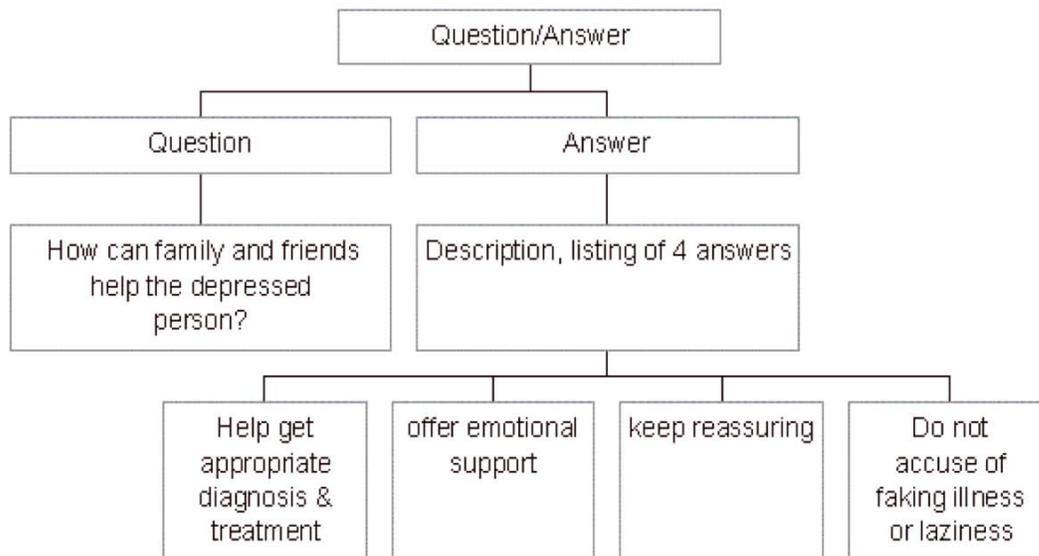
4. **How Can** Family and Friends Help the Depressed Person?

(http://www.mental-health-matters.com/articles/isyke_depress01.html)

The **most important thing anyone can do** for the depressed person is **to help** him or her get an appropriate diagnosis and treatment. The second most important thing is to offer emotional support. Do not accuse the depressed person of faking illness or of laziness, or expect him or her "to snap out of it." Eventually, with treatment, most depressed people do get better. Keep that in mind, and keep reassuring the depressed person that, with time and help, he or she will feel better.

Question/Answer Plan

Structure for Passage 4: How can family and friends help the depressed person?



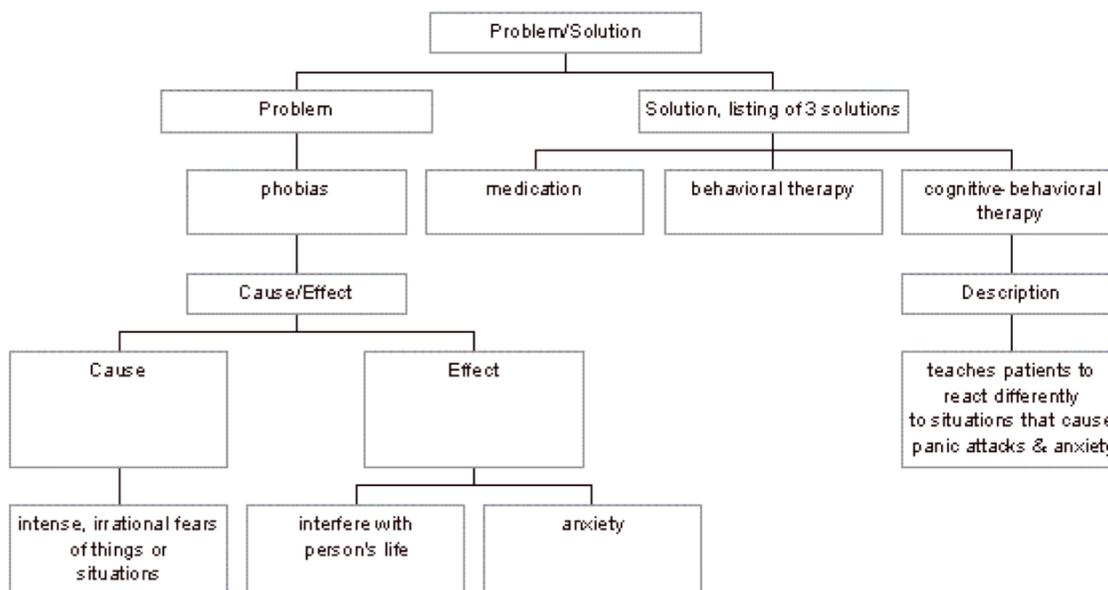
5. Phobias and their treatment.

(http://www.mental-health-matters.com/articles/isyke_phobias01.html)

Phobias are a **problem** for 1 in every 10 people. They are intense, irrational fears of certain things or situations (dogs, closed-in places, heights, escalators, tunnels, highway driving, water, flying, injuries involving blood, etc.). When phobias interfere with a person's life, it is necessary to seek **treatment**. There are three **ways to treat** phobias and the anxiety caused by them. These include medication, behavioral therapy such as diaphragmatic breathing, and cognitive-behavioral therapy, which teaches patients to react differently to the situations that trigger panic attacks and other anxiety symptoms.

Problem/Solution Plan

Structure for Passage 5: Phobias and their treatment

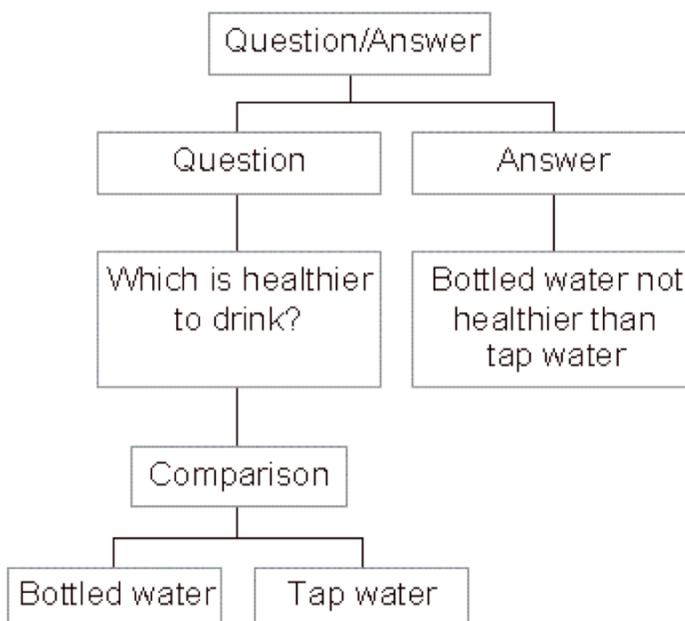


6. **Bottled Water.** U.S. News & World Report, April 2, 1984, p. 80.

Is Bottled water healthier to drink than water from your tap? **Not usually**, says a chemist at Cornell Cooperative Extension. Unless you know that something is seriously wrong with your tap water, bottled water is probably no better for you.

Question/Answer Plan

Structure for Passage 6: Bottled water



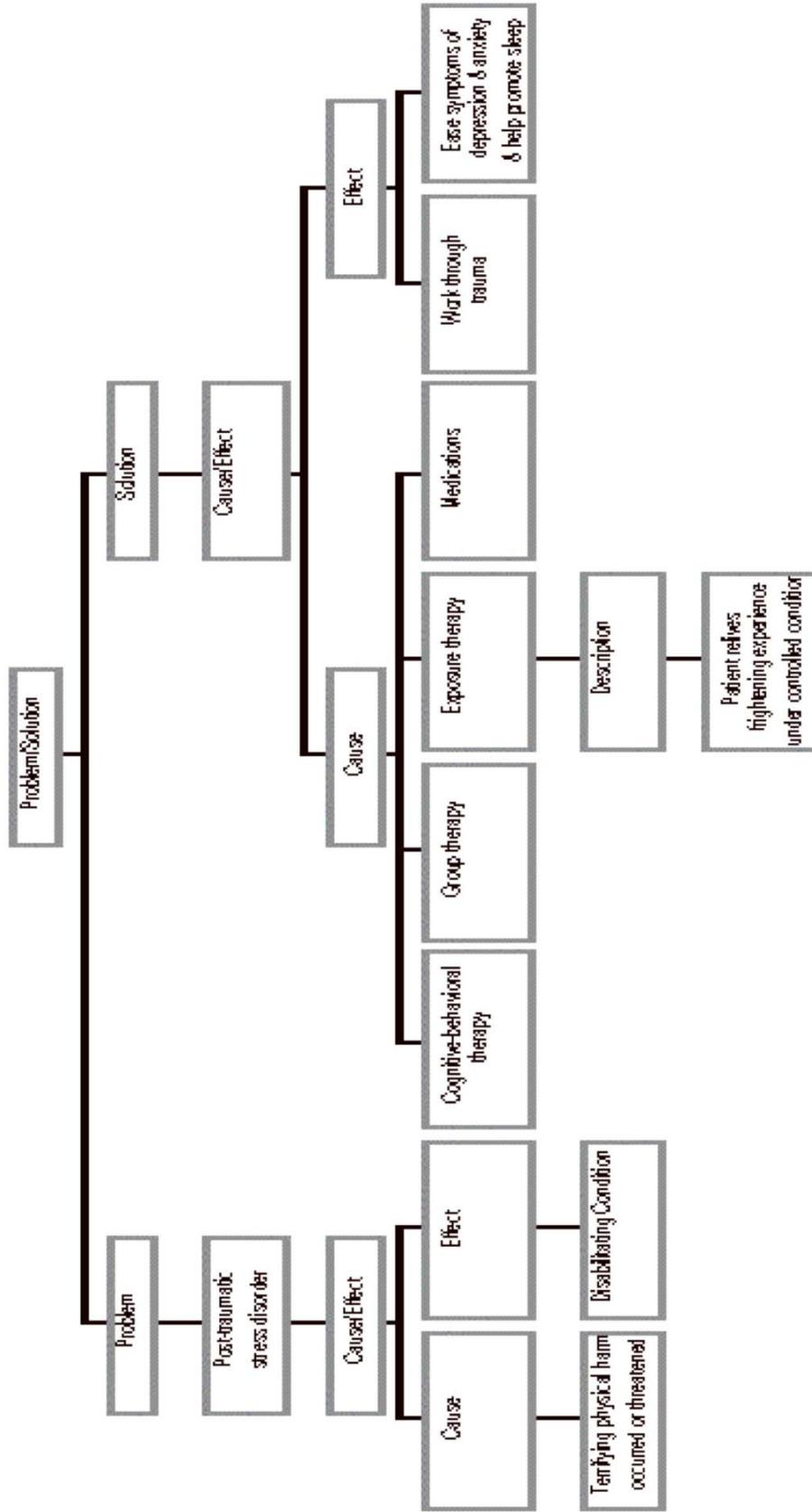
7. **Post-traumatic stress disorder.**

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Post-traumatic stress disorder is a serious mental health **problem** resulting in an extremely debilitating condition that can occur after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. Fortunately, **effective treatments** have been developed to help people with post-traumatic stress disorder. These include cognitive-behavioral therapy, group therapy, and exposure therapy, in which the patient repeatedly relives the frightening experience under controlled conditions to help him or her work through the trauma, as well as medications that help ease the symptoms of depression and anxiety and help promote sleep.

Problem/Solution Plan

Structure for Passage 7: Post-traumatic stress disorder



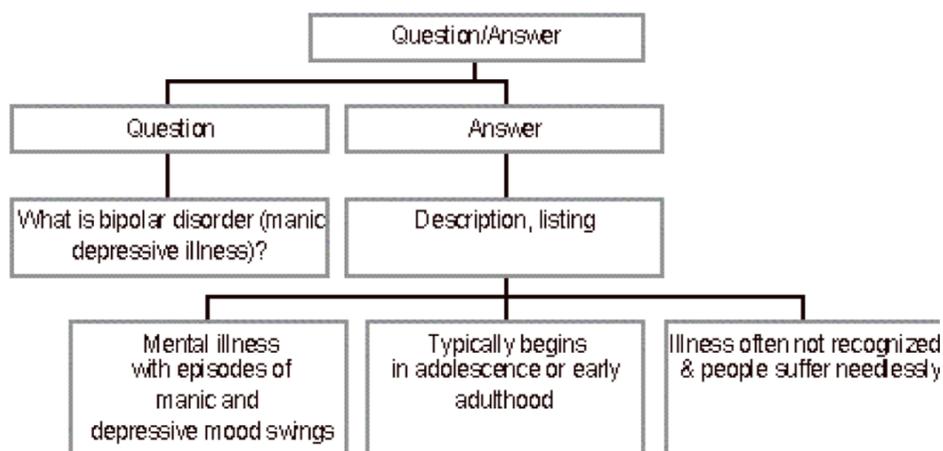
8. **What is** Bipolar Disorder?

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Bipolar disorder is also referred to as manic-depressive illness. **It is** a mental illness involving episodes of serious mania and depression. The individual's mood swings from overly "high" and irritable to sad and hopeless, and then back again, with periods of normal mood in between. Bipolar disorder typically begins in adolescence or early adulthood and continues throughout life. It is often not recognized as an illness, and people who have it may suffer needlessly for years.

Question/Answer Plan

Structure for Passage 8: What is bipolar disorder?



Our reading strategy involves us asking ourselves two questions:

1) What is the plan for the passage? and 2) What is the main idea that fits this plan? Then we use the same plan to write down what we remember. To help us use the strategy we need to do six things:

- 1) Choose the plan
- 2) Write its name on the top of the recall page
- 3) Write the main idea sentence
- 4) Use the plan to write what you remember
- 5) Check that it has been used
- 6) Add anything just remembered

There is a form or template that can be used when writing with the problem/solution plan (see Table 2 at the back of your packet). Please read the following article about osteoporosis and we will demonstrate the use of the strategy for the problem/solution plan.

Osteoporosis

The need to reduce the incidence of osteoporosis along with the development of therapies for women who cannot take estrogen is taking form as a major health problem. The National Osteoporosis Foundation explained that therapies are needed for 28 million Americans threatened by osteoporosis in an attempt to reduce the \$14 billion national direct expenditures each year; that is, \$38 million spent each day in hospitals and nursing homes. In addition, there is a need for effective therapy for women who must refrain from taking estrogen. Millions of women at menopause use estrogen to relieve hot flashes, sweating, and tension. Taking estrogen fights bone loss, prevents hip fractures, and increases cancer risks. Estrogen production in the ovaries stops after menopause. Greater lifetime exposure to estrogen increases risk of breast cancer. Research links greater lifetime exposure to estrogen to both increased bone density and breast cancer.

A related problem of equal importance is treatment of men with osteoporosis. In America two million men have osteoporosis and three million are at risk. Also, physicians rarely measure men's bone mass because only 1 in 8 men will develop osteoporotic fractures over their lifetime as compared to 1 in 2 women. There are no available FDA approved osteoporosis medications to successfully reduce fragile bones in men.

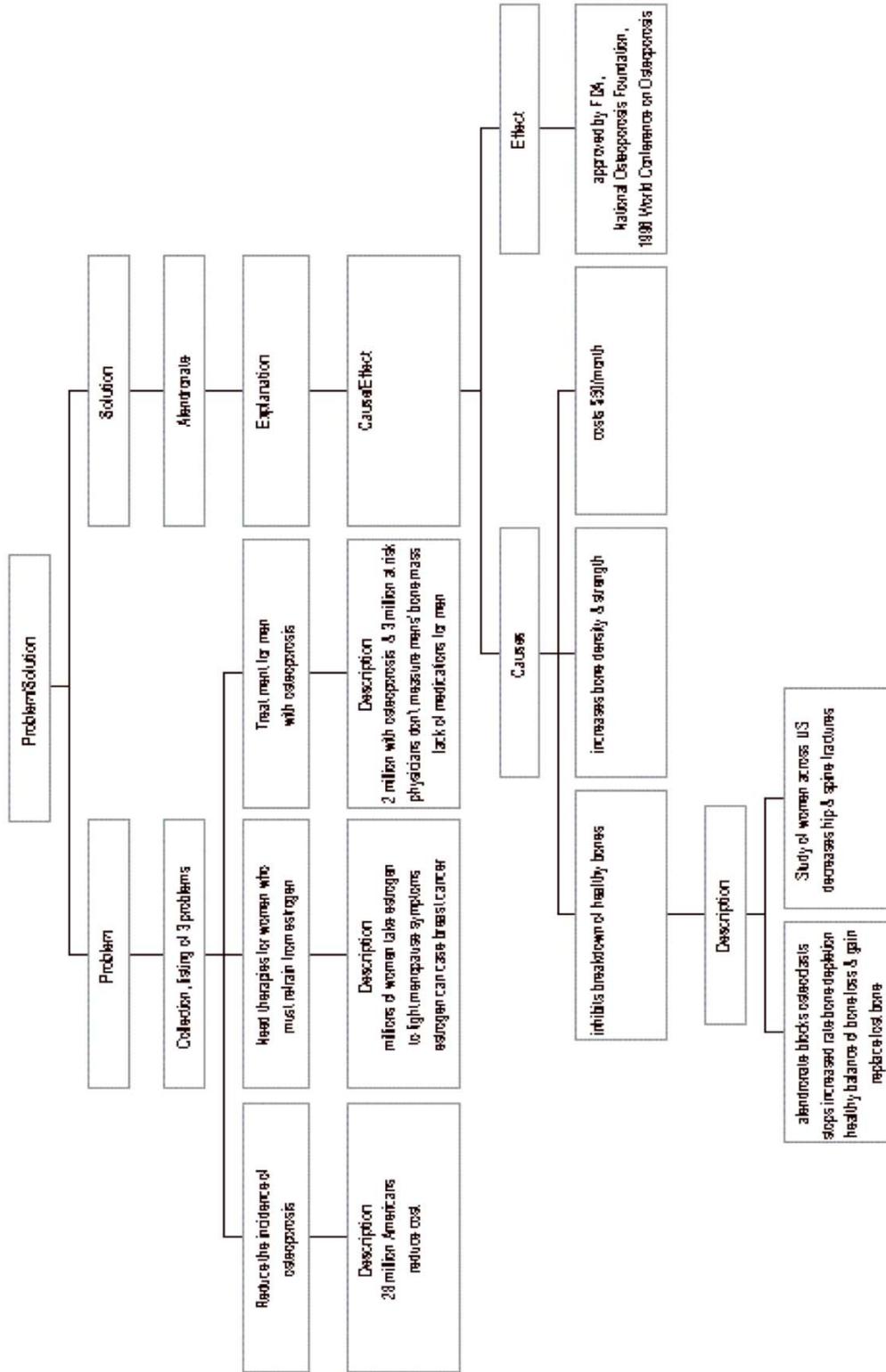
Alendronate, one of a class of drugs called bisphosphonates, holds great promise as the solution to these problems. Alendronate inhibits the breakdown of healthy bones. Alendronate substantially increases the density and strength of bones reducing fragility when taken first thing every morning. Alendronate costs a patient \$50 per month. It is in the light of these considerations that the Food and Drug Administration, the National Osteoporosis Foundation, and the 1996 World Conference on Osteoporosis officially approved the treatment by alendronate of osteoporosis in postmenopausal women.

Alendronate blocks osteoclasts so osteoblasts have less bone to replace. Osteoclasts break down older bone. Osteoblasts are bone producing cells that work to replace lost bone. With osteoporosis, osteoblasts cannot keep up. Alendronate restores a healthy balance of bone loss and gain by inhibiting osteoclasts. Alendronate effectively stops increased depletion rate by osteoclasts after menopause. Some 1997 studies are

examining Fosamax. Fosamax is Merck and Company's name for alendronate. You must take Fosamax with a full glass of water on an empty stomach and wait upright without anything else in your stomach for at least one-half hour and preferably one hour. One study looks at the effects of Fosamax on 4,000 women with osteoporosis who have never had a spinal fracture and the other study examines effects on older men with osteoporosis.

It has been mentioned that alendronate inhibits bone breakdown decreasing hip and spine fractures. Decreases in fractures were found in a study with 6,459 women across the U.S. who had reached menopause and suffered at least one spinal fracture. This well-designed study completed in 1996 showed a 51% reduction in risk for hip fractures and a 46% reduction in risk of spine fractures. Any side effects for these women were rare and mild.

Plan for Osteoporosis Passage Including Major Sub-Plans



Now, you will get to try the strategy by reading and remembering the passage on Treating Manic-Depressive Illness.

Treating Manic-Depressive Illness

(http://www.mental-health-matters.com/articles/dw_bipolar01.html)

Manic-depressive illness or bipolar disorder is a devastating problem for many people. For those afflicted with the illness, it is extremely distressing and disruptive. Like other serious illnesses, manic-depressive illness is also hard on spouses, family members, friends, and employers. Family members of people with manic-depressive illness often have to cope with serious behavioral problems (such as wild spending sprees) and the lasting consequences of these behaviors.

Almost all people with manic-depressive illness, even those with the most severe forms, can be treated in order to obtain substantial stabilization of these problematic mood swings. Medication is a critical aspect of treatment to help solve severe mood swings. One medication, lithium, is usually very effective in controlling mania and preventing the recurrence of both manic and depressive episodes. More recently, the mood stabilizing anticonvulsants carbamazepine and valproate have also been found useful, especially in more refractory bipolar episodes. Electroconvulsive therapy (ECT) is often helpful in the treatment of severe depression and/or mixed mania that does not respond to medications. As an adjunct to medications, psychotherapy is often helpful in providing support, education, and guidance to the patient and his or her family.

Find the plan used in the passage. Use it to write down what you remember on the next page in your packet. You can refer to Table 2 to help you write your recall; try using the template and some signaling words.

- 3 - 4 TUT, TUT! It is good to find the right plan; it is critical
 5 NOT BAD! to choose and use some plan, rather than .
 6 GREAT! just listing ideas.

Program Objective: To improve recall by identifying and using the writing plans in reading materials.

Remember that each of the plan has a **special way to pattern** the sentences in a passage.

Problem/solution: The pattern of the Problem/solution plan is that there is part of the passage that tells about a problem (question, puzzle, concern), and another that tells about its solution (answer, reply). In the question/answer version the answer must deal with the ideas discussed in the question and provide some answer. In the problem/solution version often the causes and effects of the problem are discussed first; then, a solution follows that should attempt to block or eliminate at least one of the causes of the problem.

Template for Writing with the Problem/Solution Plan:

The problem is _____. . Its solution is._____.

The problem is(paragraph(s) includes its cause and effect and a description about the problem).....

The solution is(paragraph(s) includes a description of the solution and how it gets rid of the cause of the problem or tries to).....

* Once you have chosen the plan you must use it to organize your written recall.

Remember: Choose it, Use it, or Lose it!

* To use the plan requires your attention before, while, and after you write your recall.

* While you write put your ideas into sentences and paragraphs that follow the pattern of the plan identified.

* After you write, check that you used the correct organization, correctly.

* To use it:

- i. write its name on the top of the page where you'll be writing your recall (to help you get organized).
- ii. write the main idea sentence (to set up the plan) The main idea focuses on the problem and its solution. (See the writing template: The problem is _____, and its solution is _____.)
- iii. arrange sentences and paragraphs to match the plan (keep thinking about how the plan works).
- iv. check that you've used it (Ask "Have I discussed the main idea the same way as in the passage?")
- v. write down anything you've only just remembered (It often happens that you think of more information as you are checking).

Next you will practice using the strategy with a passage.

Rat Allergies

An occupational hazard for researchers who work with animals is that they often become allergic to the rats and mice used for experiments.

New evidence, presented at a recent meeting in Washington sponsored by the National Institutes of Health, suggests that it is not the fur or skin of these animals that is most to blame, but protein substances in urine.

Dr. Andrew J. M. Slovak, a British physician who spoke at the meeting, said that kindness to the animals may help. Workers who soothe their charges when picking them up to examine them are less exposed to the proteins that can trigger allergies.

FEEDBACK

1. Did you pick out the organization as problem/solution?

If so, _____ great!

If not, _____ did you ask the two questions before reading?

_____ did you look for the plan? ("hazard ... is ..allergic to rats", evidence about the cause and suggestion to help eliminate exposure to the cause of the problem: protein in the urine)

_____ did you find the main idea organized by the plan?
(the problem of allergies to rats and mice may be solved by kindness to them since kindness reduces exposure to the cause of the problem: protein in urine)

2. Did you write the name of the plan at the top of the recall page?

If so, _____ so far, so good!

If not, _____ mmmmmmm!

3. Did you write down the main idea as the first sentence?

If so, _____ keep it up!

If not, _____ oh no!

4. Did you have two parts in arranging your sentences?

If so, _____ not far to go now!

If not, _____ tut, tut!

5. Were the two parts: one for the problem and one for the solution

If so, _____ I be you remembered a lot!

If not, _____ Oh rats!

6. Did you check?

If so, _____ double smiles!

If not, _____ don't be so overconfident!

Table 2
 Problem/Solution and Comparison Writing Plans and
 Signals that Cue Readers to these Plans

Writing Plan & Definition	Signals
<u>Problem/solution</u>	<u>Problem:</u> problem, question, puzzle,
The main ideas are organized into two parts: a problem part and a solution part that responds to the problem by trying to eliminate it, or a question part and an answer part that responds to the question by trying to answer it.	perplexity, enigma, riddle, issue, need to prevent, trouble, _____
e.g., scientific articles often first raise a question or problem and then seek to give an answer or solution.	_____
	<u>Solution:</u> solution, answer, response, reply, rejoinder, return, comeback, to satisfy the problem, to set the issue at rest, to solve problems,

Template for Writing with the Problem/Solution Plan:

The problem is Its solution is.....

The problem is(paragraph(s) includes its cause and effect and a description about the problem).....

The solution is(paragraph(s) includes a description of the solution and how it gets rid of the cause of the problem or tries to).....

APPENDIX C. WEB-BASED CONDITION TRAINING MATERIALS

Web-based training materials

Student's Training Program



Goal of training: To increase your memory of what you read by using the structure in reading materials.

To achieve this, we will teach you a strategy. A strategy is a plan for getting to a goal. Our goal is to remember more information from what we read.

Please answer the following question and submit your answer to us.

Subject:	<input type="text" value="Interest Question"/>
Do you want to improve your ability to remember what you read?	
Your Response:	<input type="text"/>
Your email:	<input type="text"/>
<input type="submit" value="Submit"/>	

Objectives:

a. FOR YOU:

*Improve your learning and your memory by identifying and using an organizational plan in reading materials.

b. FOR US:

*Refine previous approaches to teaching the "Plan Method" with college students.

Research on the Plan Method strategy over the past decade indicates that with practice learners can use the Plan Method strategy effectively and increase the amount of written information they can remember. One of the main findings in previous studies was that for all age groups successful readers employ a deliberate plan or strategy for remembering what they read. Successful readers identify and utilize the writing plan used in their reading materials; they use this plan to help them remember what they have read when they discuss the information with others or write down what they remember about their reading. In this program you will learn how to use this strategy for reading and remembering.

Another important finding is that with practice learners of all ages can use this strategy effectively and increase the amount of information they can remember. In other words, when it comes to reading comprehension skill, it is "Use it or lose it."

All participants will be able to increase the amount of information remembered from reading materials after this instruction. Not only will the amount of information be increased, but this strategy will help you to identify and remember the most important information you read. We appreciate your participation and hard work in this program, and we expect that you will achieve important personal benefits.

Go to the next page.



Student's Training Program

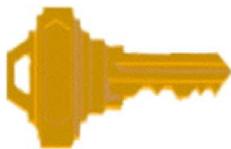


We read for many reasons. Sometimes we read because we want to enjoy a story. Other times we may want to learn information. We will use our strategy when we want to remember the information we have read.

Here are five things you will need to know about reading for information:

1. The writer wants to tell you something.
2. You must be told in writing.
3. There are **5 possible plans** used to organize information about a topic.
4. The **writer should use one of the 5 plans** to organize his or her main ideas about the topic.
5. **Finding this plan is the key to getting the writer's main ideas or message.**

Our strategy is to find the plan the author used to write the information. Then we will use the same plan to help us remember the information. This is called the PLAN STRATEGY.



Finding the Author's Plan is the key to understanding and remembering

How Do We Find the Author's Plan?

There are 5 plans that authors can use to organize a passage. These are:

1. Problem/Solution Plan

2. Cause/Effect Plan

3. Comparison Plan

4. Sequence Plan

5. Description Plan

The plan you will learn is:

The Problem/Solution Plan

If you recognize the plan the author is using you can use it to help you remember what you read.

Looking for the plan is similar to finding the best streets to take when riding a bike or driving a car. The streets have traffic signs to guide you. Texts have signs too. The signs are called **signaling words**. The **signaling words help you to see the organization of the text**.

Each plan has its own signaling words. The signaling words are the signs you



use to find the author's plan.

Go to previous page Go to the next page.



Student's Training Program

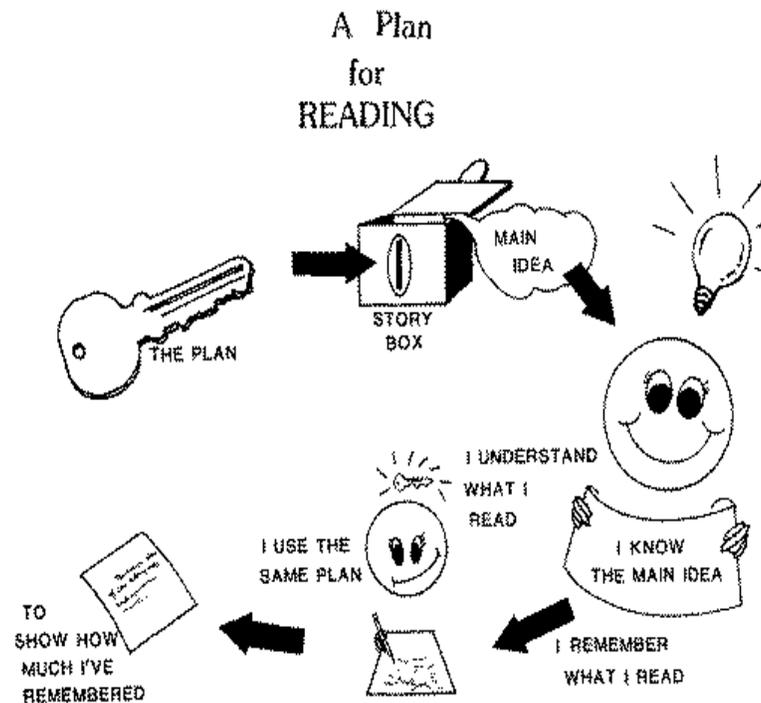


On the previous page you have learned that there are 5 different ways or plans the author can use to organize his or her ideas in a passage. On this page you will learn more about how we can find the plan and use it to understand and remember more from what you read.

Finding the Plan



is the key to



Understanding and Remembering...



Finding The Plan is the key...

Go to the next page to see how the plan works...

Go to previous page



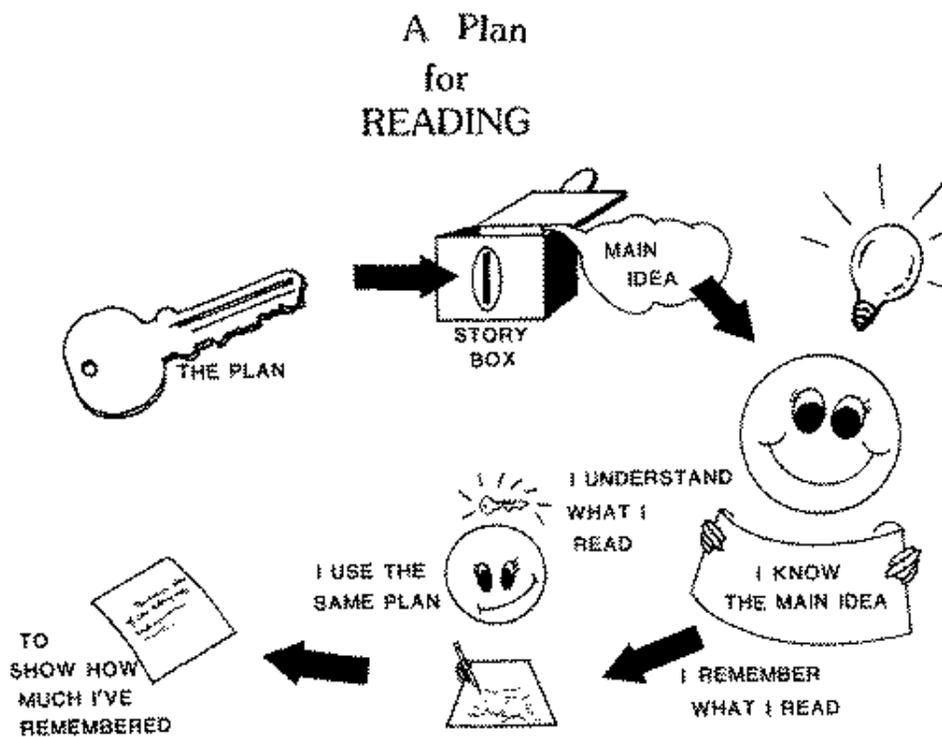
Go to the next page.



Student's Training Program



A Plan for Reading



Do these things:

- Find the **plan** when you read
- Use the **same plan** to tell what you remember

Go to previous page Go to the next page.



Student's Training Program

Introduction to Training Session



Aim 1: To establish a rationale for using the reading strategy.

During this session I will show you a way to increase this ability to get information from what you read. This will involve using a strategy, deliberate plan, for remembering. Our strategy involves two steps. In reading, we find the organizational plan used by the writer. In remembering, we use the same organizational plan. This is a strategy to improve memory. The strategy is called **using the plan**.

We have taught others to use this strategy. A trained group of readers could remember twice as much information from their reading materials after instruction (both 1 day and 3 weeks after) than they could before; and they outperformed an untrained group by twice the amount recalled. Moreover, readers in both groups who found and used the author's plan remembered more information from texts than those who did not find the plan.



Aim 2: To specify learning and teaching tasks of the program.

Communication. Your job will be to listen attentively to the ways in which this strategy for remembering is applied to reading, to apply it to reading materials, and, after you leave, to apply it to your own reading. Our job will be to show you how to use the strategy and to check on your efficiency in using it.



Principles.

Communication. We know five facts about reading for information.

1. The writer wants to tell you something.
2. You must be told in writing.
3. There are only a small number of possible plans in which to organize information about a topic.
4. The writer should organize his or her main ideas about a topic with a plan.
5. To find this organizational plan is the key to getting the writer's main ideas or message.

You will want to use this strategy when you want to remember what the writer is trying to tell you. You will not want to use the strategy when you are reading for the purpose of finding a particular fact.

Go to previous page Go to the next page.



Student's Training Program



Now try the following exercise. Complete exercise 1 and submit your answers to us.

Subject:

A strategy for remembering what I read has two steps.

In READING, I will ...In REMEMBERING, I will...This strategy is called USING

Your email:

Go to previous page Go to the next page.



Student's Training Program



Program Objectives: To improve recall by identifying and using the writing plans in reading materials.

In order to use a plan for reading and remembering text, it will be helpful to learn about five commonly used plans in reading materials. The five plans are designated as follows: **Description, sequence, causation, problem/solution, and comparison.** Listing (or collection) can be used along with any of these plans.

During this session you will learn about one of these five plans called problem/solution. The problem/solution structure was selected for training because of its importance and use in college and everyday life. The problem/solution structure is widely used in scientific journals, research reports in magazines, and medical information. The following Table describes the problem/solution plan and signals that can cue you into this plan.

Problem/Solution Plan and Signals that Cue Readers to this Plan

Writing Plan & Definition	Signals
Problem/Solution	
<p>The main ideas are organized into two parts: a problem part and a solution part that responds to the problem by trying to eliminate it, or a question part and an answer part that responds to the question by trying to answer it.</p> <p>e.g. scientific articles often first raise a question or problem and</p>	<p>problem: problem, question, puzzle, perplexity, enigma, riddle, issue, query, need to prevent, the trouble, *</p> <p>solution: solution, answer, response, reply, rejoinder, return, comeback, to satisfy the problem, to set the issue at rest, to solve these problems, *</p>

then seek to give an answer or solution.	
--	--

* Please try to find and remember other signaling words for the problem/solution plan from the practice passages and exercises you will work on today.

Go to previous page	Go to the next page.
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Student's Training Program

THE PROBLEM/SOLUTION PLAN



The problem/solution plan has two parts, a problem part and a solution part; the solution part has to respond to the ideas in the problem part. This plan also has a question/answer form; here a question is raised in one part and in the other part an answer is given to the question. Scientific articles often adhere to the problem/solution or question/answer plan, first raising a problem or a question and then seeking to give a solution or answer.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

The first example of this plan in the following advertisement uses the question and answer format.

Example 1

YOUR SHISH KABOBS LOOK SO TANTALIZING. SHOULD YOUR GLASSES BE SPOTTY? GET THE CASCADE LOOK.... VIRTUALLY SPOTLESS.

The details of this advertisement expand on the question and the answer segments of this plan. The first paragraph below from this advertisement repeats and expands on the question that appeared in the bold face title of the advertisement; the second paragraph explains why Cascade is the solution to the spotty glass problem.

"Your guests will rave when they see this dish. But what about your glasses? You don't want spots at a time like this, or anytime. (Here the question is answered "NO" and the problem of spots emphasized.)"

"The spotty glass shows that plain water alone can leave dulling spots. (Here we see that the problem of spots is caused by plain ordinary water.) So it's good to know that Cascade's sheeting action fights drops that spot...gives your guests glasses with the Cascade look! (Here Cascade is identified as the suggested solution because it fights water drops.)"



Better Homes and Gardens has run a feature entitled "Tips, Tools, and Techniques" that explicitly signals the problem/solution plan to its readers. The next example was taken from this column.

Example 2

"PROBLEM: After you've waxed the car, dried residue lingers around the grill.

SOLUTION: A flagged-tip nylon paintbrush will remove the polish from crevices without scratching the paint (H. G., Springville, Tenn.)."

Our strategy for reading and remembering will focus on the **overall plan** used in the text rather than plans used to organize details in a text. You can use this information in you everyday activities. What we want you to do is to get into the habit of identifying how information is organized and then using that organization to help you remember the important information. Signaling words can cue you into that plan used by an author to organize his or her main ideas. Remember that we are looking for the overall writing plan that organizes all the information presented; signals will probably be found for plans that organize just parts of the information too, but we will focus on the plan that organizes all of the information into a whole. The information organized by this overall plan is the main idea the author is trying to tell you. Go through Table 1 to review the problem/solution plan and read the signals listed for the plan.

Go to previous page Go to the next page.



Student's Training Program



Please read the advertisements below and determine the overall plan used to organize the information. Write down the name of the plan and the signaling words for each advertisement. When you have finished, we will go over the plans for the advertisements as a group and discuss any disagreements or problems.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Review Ad. #1

WANT A TOUGH STAIN OUT? SHOUT IT OUT!

Subject:	<input type="text" value="Plan for advertisement 1"/>
Write the name of the plan and the signaling words for the first advertisement.	<input type="text" value="The name of the plan is: Signaling words:"/>
Your email:	<input type="text"/>
<input type="submit" value="Submit"/>	

Review Ad. #2

"WITH EIGHT BROTHERS AND SISTERS, BIRTHDAYS USED TO BE A PROBLEM." NOW I SEND THE BIRTHDAY

PARTY BOUQUET FROM BY FTD FLORIST. IT'S MORE
THAN A GIFT, IT'S A CELEBRATION.

Subject:	<input type="text" value="Plan for advertisement 2"/>
Write the name of the plan and the signaling words for the first advertisement.	<input type="text" value="The name of the plan is: Signaling words:"/>
Your email:	<input type="text"/>
<input type="button" value="Submit"/>	



We are focusing on the plan the author used to write the advertisement. Once you figure out what the author is telling you then you can evaluate his or her message. Remember this strategy is to be used when you want to remember a lot from your reading and you want to know what the author said. You probably would not use it when casually looking over the newspaper for enjoyment.

Go to previous page **Go to the next page.**



Student's Training Program



See if you can write an advertisement for your new invention, the safety pin, using the problem/solution plan. Write your advertisement below.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Subject:	<input type="text" value="Write your own advertisement"/>
Write your own advertisement for the safety pin.	<div style="border: 1px solid gray; height: 160px; width: 100%;"></div>
Your email:	<input type="text"/>
<input type="button" value="Submit"/>	

Go to previous page Go to the next page.



Student's Training Program



Look at the tiger picture.



Now try to write about the picture using the problem/solution writing plan.



If you need help with the signaling words for the **Problem/Solution Plan, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.**

Subject:	<input type="text" value="Write about the tiger pictur"/>
Write about the picture using the problem/solution plan.	<div style="border: 1px solid gray; height: 150px; width: 100%;"></div>
Your email:	<input type="text"/>
<input type="button" value="Submit"/>	

Go to previous page	Go to the next page.
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Student's Training Program



For each of the passages write the signaling words that cue you into the author's plan and choose the name of the plan. The options are: *Problem/Solution*, *Question/Answer*, and *No Plan*.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Passage 1.

Pollution is a problem for our rivers. Polluted rivers are eyesores. They are also health hazards. One solution is to stop the dumping of industrial waste.

Choose the name of the Overall Plan for Passage 1

What signaling words did the author use in this passage?

Your E-mail Address:

Submit

Passage 2.**Coping with Disaster: Tips for College Students**

(<http://www.nmha.org/reassurance/collegetips.cfm>)

For many college students, the horrific Sept.11 terrorist attacks in New York City and Washington, D.C., mark the first major national catastrophe they have ever experienced. In the aftermath of the attacks, students across the country may feel uncertain about a future they had just begun to carefully map out. Some may have suffered the loss of parents, relatives or friends. Others may wonder how our nation's response to the attacks will involve them. Nobody is unaffected.

Here are some suggestions of how to cope with this problematic situation:

- Talk about it and encourage others to share their perspectives.
- Take care of yourself.
- Stay connected to friends and family.
- Make plans to visit family or other people who can offer reassurance.
- Do something positive that will help you gain a greater sense of control (for example, give blood, take a first aid class, or donate food or clothing).
- Ask for help if you feel overwhelmed by lingering thoughts about the disaster, it's not a sign of weakness.

Choose the name of the Overall Plan for Passage 2 <input type="text"/>	
What signaling words did the author use in this passage?	<input type="text"/>
Your E-mail Address:	<input type="text"/>
<input type="submit" value="Submit"/>	

Go to previous page	Go to the next page.
	

Student's Training Program



For each of the passages write the signaling words that cue you into the author's plan and choose the name of the plan. The options are: *Problem/Solution*, *Question/Answer*, and *No Plan*.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Passage 3.

Attention Deficit Disorders

(Yoga Journal, December 2001, 164, p.96-103)

Attention Deficit Disorders (ADD) is one of the most common behavioral problems of childhood. ADD affects 3-9% of the school-age population. The most common symptoms associated with ADD include difficulty following directions and poor control over impulses.

It is essential for individuals with ADD to learn how to control their condition. Many health-care professionals today recommend a multidisciplinary approach for controlling ADD. This approach includes medication but also mind-body approaches, such as yoga. Even though medications alone can successfully control ADD for a short period, there is no evidence that they can be used over an extended period without side effects. Some experts now believe that for long term control of ADD a combination of medication and physical and mental discipline, such as yoga, may be the best approach. Yoga integrates both the body and mind and can help engage the attention system more readily than medication alone. It improves self-awareness, coordination, and physical fitness without competition, and it provides individuals with ADD with a reliable structure to engage their long-term interest.

Choose the name of the Overall Plan for Passage 3 <input type="text"/>	
What signaling words did the author use in this passage?	<input type="text"/>
Your E-mail Address:	<input type="text"/>
<input type="submit" value="Submit"/>	

Passage 4.

How Can Family and Friends Help the Depressed Person?

(http://www.mental-health-matters.com/articles/isyke_depress01.html)

The most important thing anyone can do for the depressed person is to help him or her get an appropriate diagnosis and treatment. The second most important thing is to offer emotional support. Do not accuse the depressed person of faking illness or of laziness, or expect him or her "to snap out of it." Eventually, with treatment, most depressed people do get better. Keep that in mind, and keep reassuring the depressed person that, with time and help, he or she will feel better.

Choose the name of the Overall Plan for Passage 4 <input type="text"/>	
What signaling words did the author use in this passage?	<input type="text"/>
Your E-mail Address:	<input type="text"/>
<input type="submit" value="Submit"/>	

Go to previous page	Go to the next page.
	

Student's Training Program



For each of the passages write the signaling words that cue you into the author's plan and choose the name of the plan. The options are: *Problem/Solution*, *Question/Answer*, and *No Plan*.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Passage 5.

Phobias and their treatment.

(http://www.mental-health-matters.com/articles/isyke_phobias01.html)

Phobias are a problem for 1 in every 10 people. They are intense, irrational fears of certain things or situations (dogs, closed-in places, heights, escalators, tunnels, highway driving, water, flying, injuries involving blood, etc.). When phobias interfere with a person's life, it is necessary to seek treatment. There are three ways to treat phobias and the anxiety caused by them. These include medication, behavioral therapy such as diaphragmatic breathing, and cognitive-behavioral therapy, which teaches patients to react differently to the situations that trigger panic attacks and other anxiety symptoms.

Choose the name of the Overall Plan for Passage 5

What signaling words did the author use in this passage?

Your E-mail Address:

Passage 6.**Bottled Water.**

(U.S. News & World Report, April 2, 1984, p. 80).

Is Bottled water healthier to drink than water from your tap? Not usually, says a chemist at Cornell Cooperative Extension. Unless you know that something is seriously wrong with your tap water, bottled water is probably no better for you.

Choose the name of the Overall Plan for Passage 6 <input type="text"/>	
What signaling words did the author use in this passage?	<input type="text"/>
Your E-mail Address:	<input type="text"/>
<input type="button" value="Submit"/>	

Go to previous page	Go to the next page.
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Student's Training Program

For each of the passages write the signaling words that cue you into the author's plan and choose the name of the plan. The options are: *Problem/Solution*, *Question/Answer*, and *No Plan*.



If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Passage 7.

Post-traumatic stress disorder.

(http://www.mental-health-matters.com/articles/dw_ptsd01.html)

Post-traumatic stress disorder is a serious mental health problem resulting in an extremely debilitating condition that can occur after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. Fortunately, effective treatments have been developed to help people with post-traumatic stress disorder. These include cognitive-behavioral therapy, group therapy, and exposure therapy, in which the patient repeatedly relives the frightening experience under controlled conditions to help him or her work through the trauma, as well as medications that help ease the symptoms of depression and anxiety and help promote sleep.

Choose the name of the Overall Plan for Passge 7

What signaling words did the author use in this passage?

Your E-mail Address:

Submit

Passage 8.**What is Bipolar Disorder?**

(http://www.mental-health-matters.com/articles/dw_bipolar01.html)

Bipolar disorder is also referred to as manic-depressive illness. It is a mental illness involving episodes of serious mania and depression. The individual's mood swings from overly high and irritable to sad and hopeless, and then back again, with periods of normal mood in between. Bipolar disorder typically begins in adolescence or early adulthood and continues throughout life. It is often not recognized as an illness, and people who have it may suffer needlessly for years.

Choose the name of the Overall Plan for Passage 8

What signaling words did the author use in this passage?

Your E-mail Address:

Go to previous page Go to the next page.



Student's Training Program



For each of the passages write the signaling words that cue you into the author's plan and choose the name of the plan. The options are: *Problem/Solution*, *Question/Answer*, and *No Plan*.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Passage 7.

Post-traumatic stress disorder.

(http://www.mental-health-matters.com/articles/dw_ptsd01.html)

Post-traumatic stress disorder is a serious mental health problem resulting in an extremely debilitating condition that can occur after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. Fortunately, effective treatments have been developed to help people with post-traumatic stress disorder. These include cognitive-behavioral therapy, group therapy, and exposure therapy, in which the patient repeatedly relives the frightening experience under controlled conditions to help him or her work through the trauma, as well as medications that help ease the symptoms of depression and anxiety and help promote sleep.

Choose the name of the Overall Plan for Passage 7 <input type="text"/>	
What signaling words did the author use in this passage?	<input type="text"/>
Your E-mail Address:	<input type="text"/>
<input type="submit" value="Submit"/>	

Passage 8.

What is Bipolar Disorder?

(http://www.mental-health-matters.com/articles/dw_bipolar01.html)

Bipolar disorder is also referred to as manic-depressive illness. It is a mental illness involving episodes of serious mania and depression. The individual's mood swings from overly high and irritable to sad and hopeless, and then back again, with periods of normal mood in between. Bipolar disorder typically begins in adolescence or early adulthood and continues throughout life. It is often not recognized as an illness, and people who have it may suffer needlessly for years.

Choose the name of the Overall Plan for Passage 8 <input type="text"/>	
What signaling words did the author use in this passage?	<input type="text"/>
Your E-mail Address:	<input type="text"/>
<input type="submit" value="Submit"/>	

Go to previous page Go to the next page.



Student's Training Program



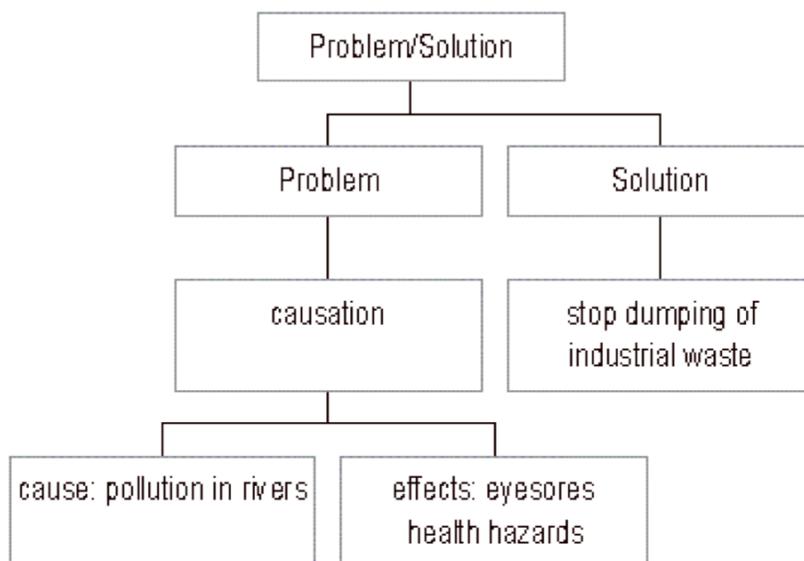
Feedback for short passages. Signaling words are in red color and underlined and top-level structures are shown with diagrams.

Passage 1.

Pollution is a problem for our rivers. Polluted rivers are eyesores. They are also health hazards. One solution is to stop the dumping of industrial waste.

Problem/Solution Plan

Structure for Passage 1



Passage 2.**Coping with Disaster: Tips for College Students**

(<http://www.nmha.org/reassurance/collegetips.cfm>)

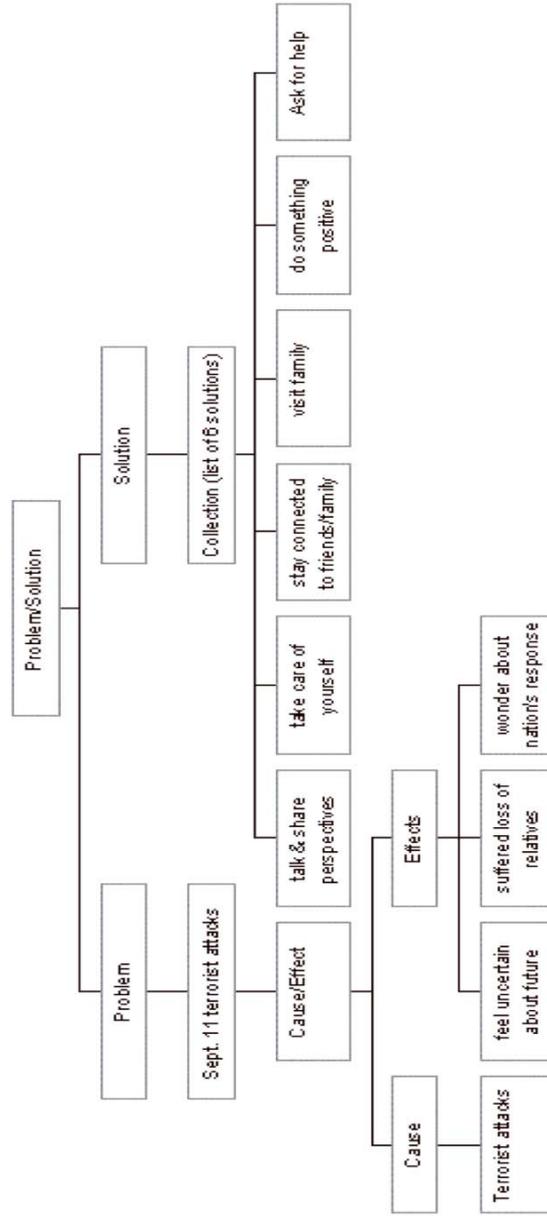
For many college students, the horrific Sept.11 terrorist attacks in New York City and Washington, D.C., mark the first major national **catastrophe** they have ever experienced. In the aftermath of the attacks, students across the country may feel uncertain about a future they had just begun to carefully map out. Some may have suffered the loss of parents, relatives or friends. Others may wonder how our nation's response to the attacks will involve them Nobody is unaffected.

Here are some **suggestions** of **how to cope** with **this problematic** situation:

- Talk about it and encourage others to share their perspectives.
- Take care of yourself.
- Stay connected to friends and family.
- Make plans to visit family or other people who can offer reassurance.
- Do something positive that will help you gain a greater sense of control (for example, give blood, take a first aid class, or donate food or clothing).
- Ask for help if you feel overwhelmed by lingering thoughts about the disaster, it's not a sign of weakness.

Problem/Solution Plan

Structure for Passage 2: Coping with Disaster



Passage 3.**Attention Deficit Disorders**

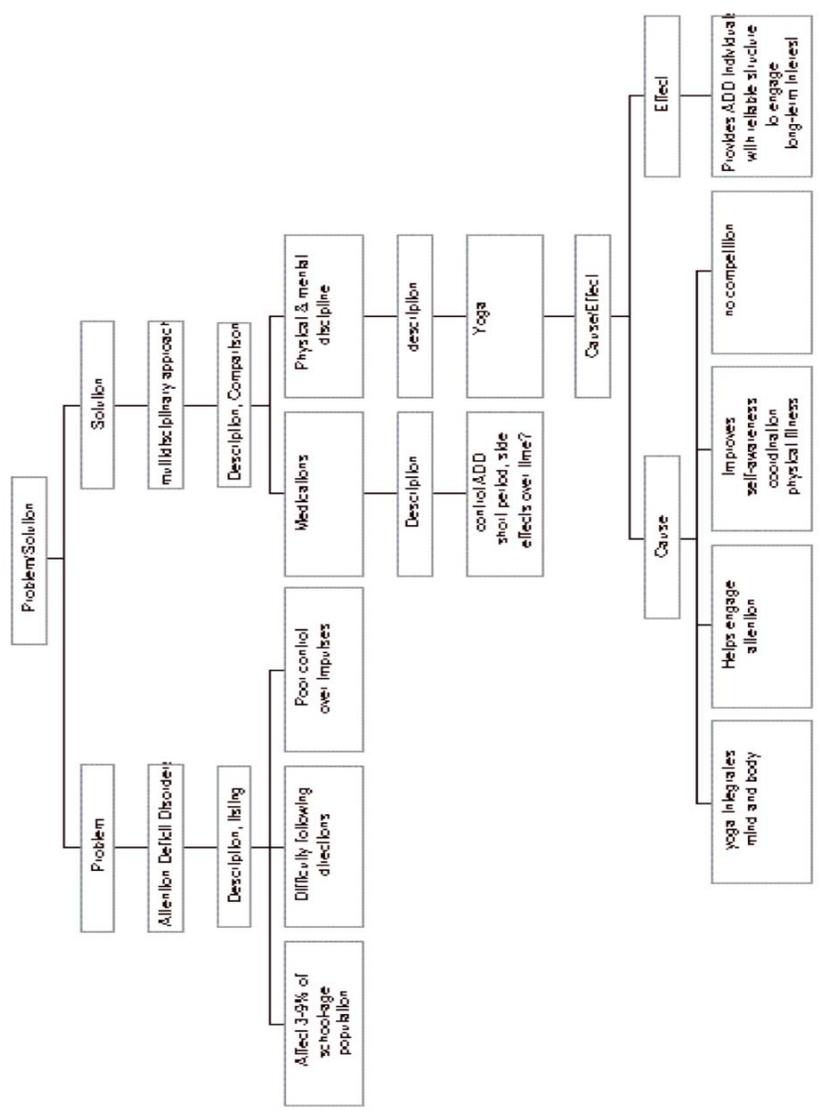
(Yoga Journal, December 2001, 164, p.96-103)

Attention Deficit Disorders (ADD) is one of the most common behavioral **problems** of childhood. ADD affects 3-9% of the school-age population. The most common symptoms associated with ADD include difficulty following directions and poor control over impulses.

It is essential for individuals with ADD to learn **how to control** their condition. Many health-care professionals today recommend a multidisciplinary **approach for controlling** ADD. This approach includes medication but also mind-body approaches, such as yoga. Even though medications alone can successfully control ADD for a short period, there is no evidence that they can be used over an extended period without side effects. Some experts now believe that for long term control of ADD a combination of medication and physical and mental discipline, such as yoga, may be the best **approach**. Yoga integrates both the body and mind and can help engage the attention system more readily than medication alone. It improves self-awareness, coordination, and physical fitness without competition, and it provides individuals with ADD with a reliable structure to engage their long-term interest.

Problem/Solution Plan

Structure for Pass age 3: Attention Deficit Disorders



Passage 4.

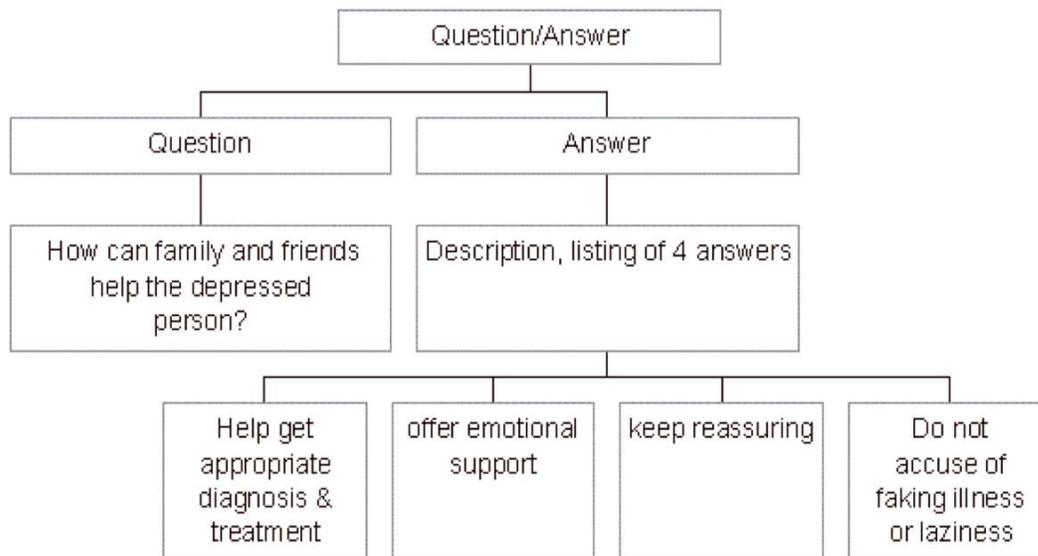
How Can Family and Friends Help the Depressed Person?

(http://www.mental-health-matters.com/articles/isyke_depress01.html)

The **most important thing anyone can do** for the depressed person is **to help** him or her get an appropriate diagnosis and treatment. The second most important thing is to offer emotional support. Do not accuse the depressed person of faking illness or of laziness, or expect him or her "to snap out of it." Eventually, with treatment, most depressed people do get better. Keep that in mind, and keep reassuring the depressed person that, with time and help, he or she will feel better.

Question/Answer Plan

Structure for Passage 4: How can family and friends help the depressed person?



Passage 5.

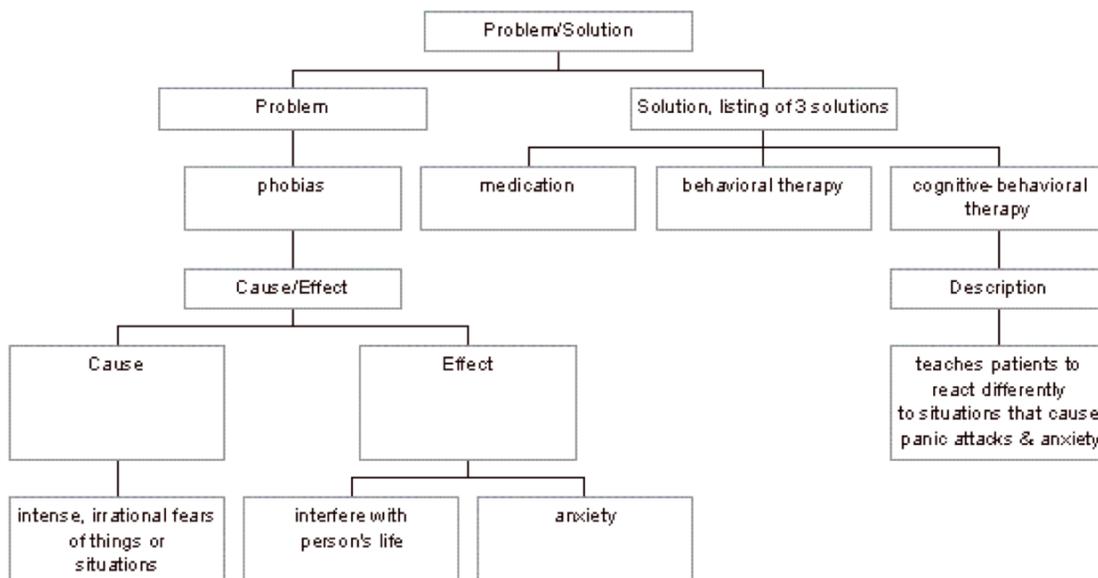
Phobias and their treatment.

(http://www.mental-health-matters.com/articles/isyke_phobias01.html)

Phobias are a problem for 1 in every 10 people. They are intense, irrational fears of certain things or situations (dogs, closed-in places, heights, escalators, tunnels, highway driving, water, flying, injuries involving blood, etc.). When phobias interfere with a person's life, it is necessary to seek treatment. There are three ways to treat phobias and the anxiety caused by them. These include medication, behavioral therapy such as diaphragmatic breathing, and cognitive-behavioral therapy, which teaches patients to react differently to the situations that trigger panic attacks and other anxiety symptoms.

Problem/Solution Plan

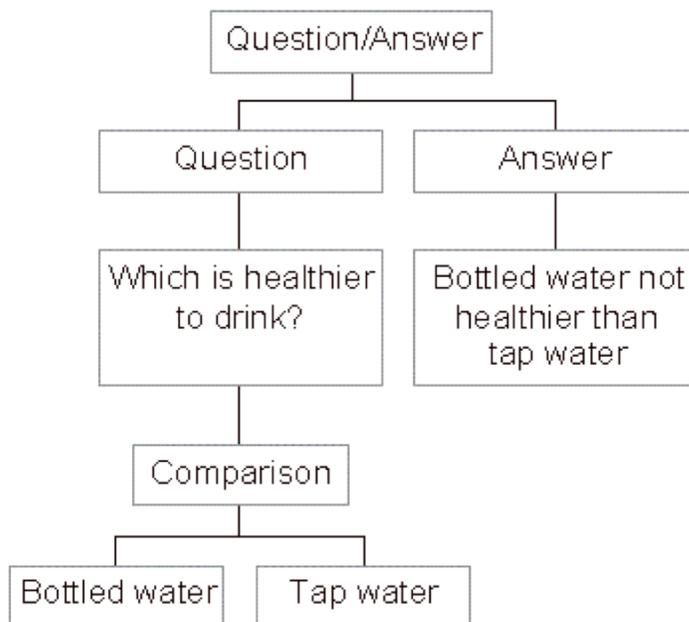
Structure for Passage 5: Phobias and their treatment



Passage 6.**Bottled Water.**

(U.S. News & World Report, April 2, 1984, p. 80).

Is Bottled water healthier to drink than water from your tap? **Not usually**, says a chemist at Cornell Cooperative Extension. Unless you know that something is seriously wrong with your tap water, bottled water is probably no better for you.

Question/Answer Plan**Structure for Passage 6: Bottled water**

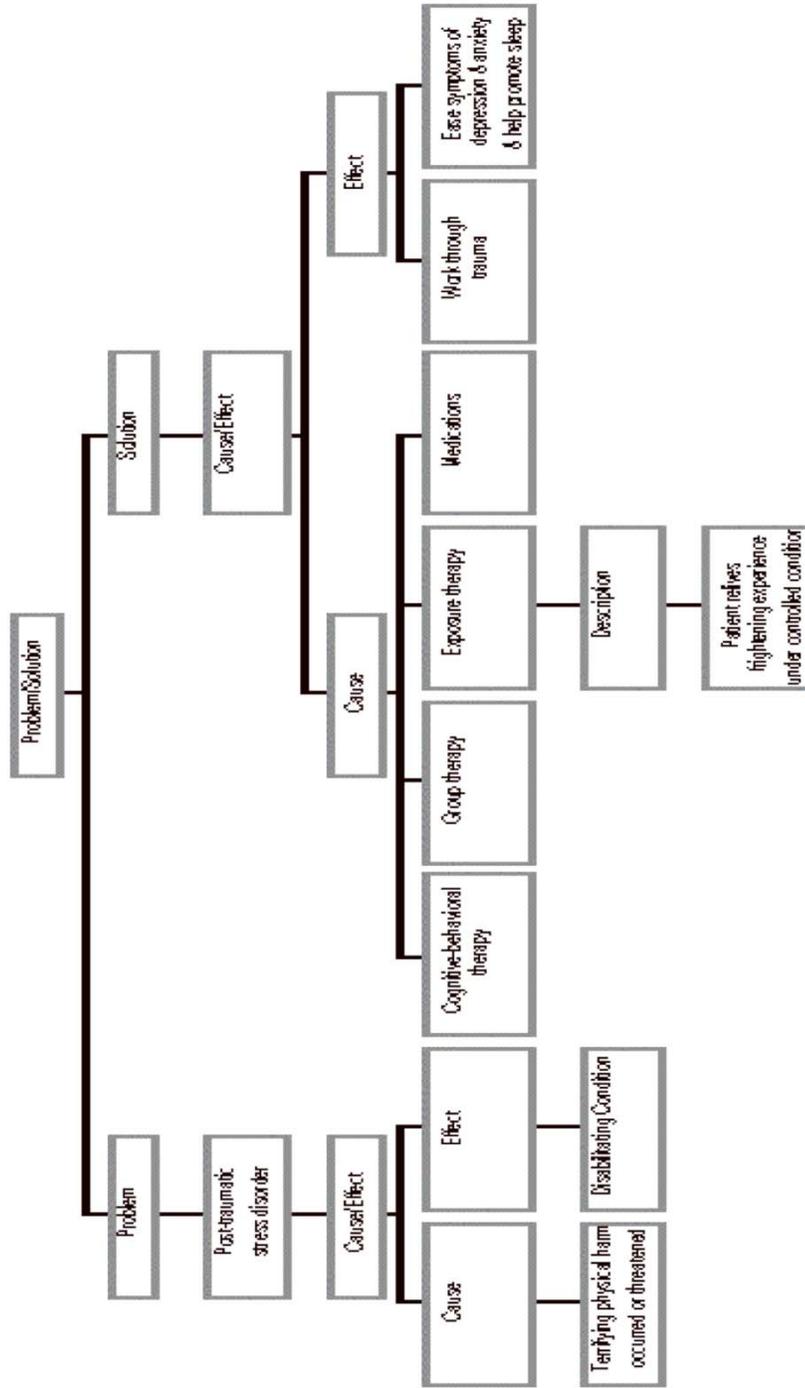
Passage 7.**Post-traumatic stress disorder.**

(http://www.mental-health-matters.com/articles/dw_ptsd01.html)

Post-traumatic stress disorder is a serious mental health **problem** resulting in an extremely debilitating condition that can occur after exposure to a terrifying event or ordeal in which grave physical harm occurred or was threatened. Fortunately, **effective treatments** have been developed to help people with post-traumatic stress disorder. These include cognitive-behavioral therapy, group therapy, and exposure therapy, in which the patient repeatedly relives the frightening experience under controlled conditions to help him or her work through the trauma, as well as medications that help ease the symptoms of depression and anxiety and help promote sleep.

Problem/Solution Plan

Structure for Passage 7: Posttraumatic stress disorder



Passage 8.

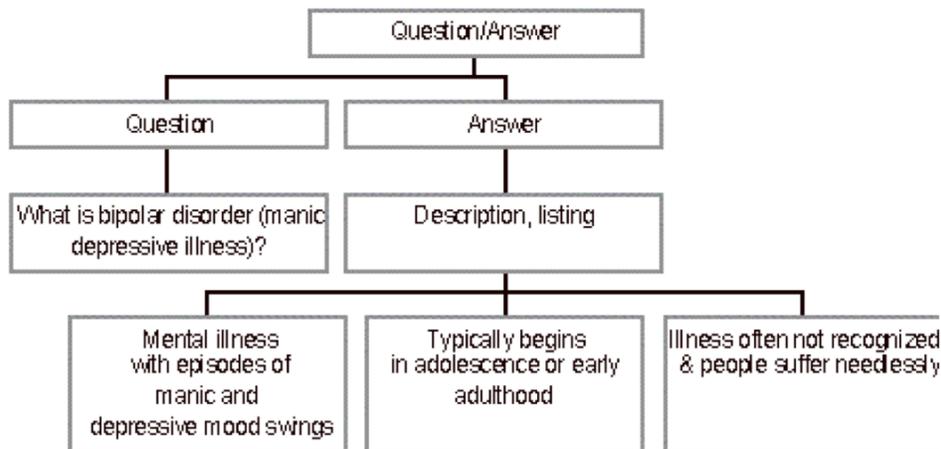
What is Bipolar Disorder?

(http://www.mental-health-matters.com/articles/dw_bipolar01.html)

Bipolar disorder is also referred to as manic-depressive illness. **It is** a mental illness involving episodes of serious mania and depression. The individual's mood swings from overly high and irritable to sad and hopeless, and then back again, with periods of normal mood in between. Bipolar disorder typically begins in adolescence or early adulthood and continues throughout life. It is often not recognized as an illness, and people who have it may suffer needlessly for years.

Question/Answer Plan

Structure for Passage 8: What is bipolar disorder?



Go to previous
page



Go to the next
page.



Student's Training Program



Remember our reading strategy involves us asking ourselves two questions:

- 1) What is the plan for the passage?**
 - 2) What is the main idea that fits this plan?**
-

Then we use the same plan to write down what we remember.

To help us use the strategy we need to do six things:

- 1) Choose the plan
 - 2) Write its name on the top of the recall page
 - 3) Write the main idea sentence
 - 4) Use the plan to write what you remember
 - 5) Check that it has been used
 - 6) Add anything just remembered
-



There is a form or template that can be used when writing with the problem/solution plan (see the following Table).

Problem/Solution Writing Plan and Signals that Cue Readers to this Plan

Writing Plan & Definition	Signals
Problem/Solution	
<p>The main ideas are organized into two parts: a problem part and a solution part that responds to the problem by trying to eliminate it, or a question part and an answer part that responds to the question by trying to answer it.</p> <p>e.g., scientific articles often first raise a question or problem and then seek to give an answer or solution.</p>	<p>problem: problem, question, puzzle, perplexity, enigma, riddle, issue, query, need to prevent, the trouble,</p> <p>solution: solution, answer, response, reply, rejoinder, return, comeback, to satisfy the problem, to set the issue at rest, to solve these problems.....</p>

Template for Writing with the Problem/Solution Plan

The problem is Its solution is

The problem is (paragraph(s) include its cause and effect and a description about the problem).....

The solution is (paragraph(s) include a description of the solution and how it gets rid of the cause of the problem or tries to)

Go to previous page Go to the next page.



Student's Training Program



Please read the following article about supertankers and we will demonstrate the use of the strategy for the problem/solution plan.

Osteoporosis

The need to reduce the incidence of osteoporosis along with the development of therapies for women who cannot take estrogen is taking form as a major health problem. The National Osteoporosis Foundation explained that therapies are needed for 28 million Americans threatened by osteoporosis in an attempt to reduce the \$14 billion national direct expenditures each year; that is, \$38 million spent each day in hospitals and nursing homes. In addition, there is a need for effective therapy for women who must refrain from taking estrogen. Millions of women at menopause use estrogen to relieve hot flashes, sweating, and tension. Taking estrogen fights bone loss, prevents hip fractures, and increases cancer risks. Estrogen production in the ovaries stops after menopause. Greater lifetime exposure to estrogen increases risk of breast cancer. Research links greater lifetime exposure to estrogen to both increased bone density and breast cancer.

A related problem of equal importance is treatment of men with osteoporosis. In America two million men have osteoporosis and three million are at risk. Also, physicians rarely measure men's bone mass because only 1 in 8 men will develop osteoporotic fractures over their lifetime as compared to 1 in 2 women. There are no available FDA approved osteoporosis medications to successfully reduce fragile bones in men.

Alendronate, one of a class of drugs called bisphosphonates, holds great promise as the solution to these problems. Alendronate inhibits the breakdown of healthy bones. Alendronate

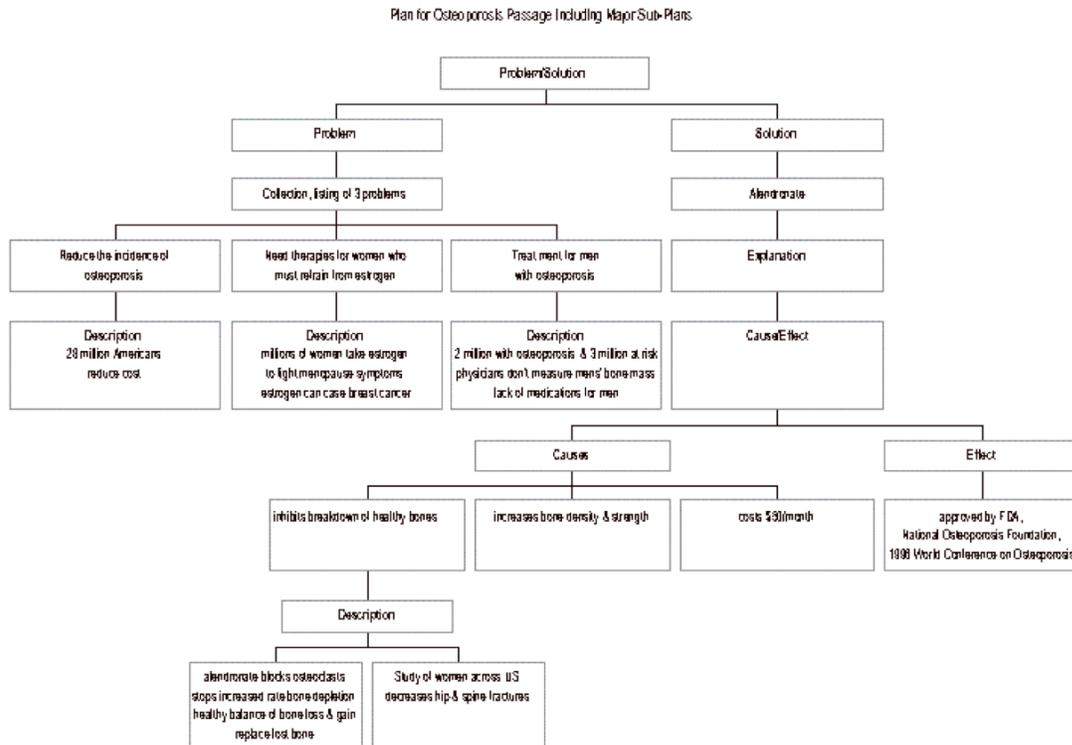
substantially increases the density and strength of bones reducing fragility when taken first thing every morning. Alendronate costs a patient \$50 per month. It is in the light of these considerations that the Food and Drug Administration, the National Osteoporosis Foundation, and the 1996 World Conference on Osteoporosis officially approved the treatment by alendronate of osteoporosis in postmenopausal women.

Alendronate blocks osteoclasts so osteoblasts have less bone to replace. Osteoclasts break down older bone. Osteoblasts are bone producing cells that work to replace lost bone. With osteoporosis, osteoblasts cannot keep up. Alendronate restores a healthy balance of bone loss and gain by inhibiting osteoclasts. Alendronate effectively stops increased depletion rate by osteoclasts after menopause. Some 1997 studies are examining Fosamax. Fosamax is Merck and Company's name for alendronate. You must take Fosamax with a full glass of water on an empty stomach and wait upright without anything else in your stomach for at least one-half hour and preferably one hour. One study looks at the effects of Fosamax on 4,000 women with osteoporosis who have never had a spinal fracture and the other study examines effects on older men with osteoporosis.

It has been mentioned that alendronate inhibits bone breakdown decreasing hip and spine fractures. Decreases in fractures were found in a study with 6,459 women across the U.S. who had reached menopause and suffered at least one spinal fracture. This well-designed study completed in 1996 showed a 51% reduction in risk for hip fractures and a 46% reduction in risk of spine fractures. Any side effects for these women were rare and mild.



The following diagram shows how the osteoporosis passage was organized. Please look at the diagram carefully.



Here is how my recall looks. When recalling the passage I followed six steps:

- 1) I chose the plan**
- 2) I wrote the name of the plan on the top of my recall**
- 3) I wrote the main idea sentence**
- 4) I used the plan to write what I remembered (I organized my recall in two paragraphs: one for the problem part, and one for the solution part)**
- 5) I checked that I used the plan**
- 6) I added anything I could remember**



Plan: Problem/solution

Main idea: Osteoporosis is a major health problem for men and women. The solution to this problem is a drug called alendronate.

Problem: There are 3 problems related to osteoporosis. The first problem is that we need to reduce the incidence of osteoporosis. Finding effective therapies for the 28 million Americans who are threatened by osteoporosis would greatly reduce the cost for treatment. The second problem is to find therapies for women who must refrain from taking estrogen. Estrogen helps fight menopause symptoms but it increases the risk of breast cancer. The third problem is treating men with osteoporosis. millions of American men have osteoporosis or are at risk. There are no medications for men with osteoporosis. Physicians don't measure men's bone loss.

Solution: The solution to these problems is a drug called alendronate. Alendronate inhibits the breakdown of healthy bones, increases bone density and strength, and only costs \$50 a month. Alendronate blocks osteoporosis, stops increased rate of bone depletion, and restores a healthy balance of bone loss and gain. Studies have shown that alendronate decreases the likelihood of hip and spine fractures in women. As a result, alendronate has been approved by the Food and Drug Administration, the National Osteoporosis Foundation, and the World conference on Osteoporosis as an effective treatment to osteoporosis.



When you are done studying the diagram please raise your hand and let the experimenter know that you are done with the materials for the osteoporosis passage. The experimenter will project a video that shows how to use the problem/solution structure to improve your recall of the osteoporosis passage. Once the video is done, please continue working with the rest of the on-line training materials.

Go to previous page Go to the next page.



Student's Training Program



Now, you will get to try the strategy by reading and remembering the passage on Treating Manic-Depressive Illness.

Treating Manic-Depressive Illness

(http://www.mental-health-matters.com/articles/dw_bipolar01.html)

Manic-depressive illness or bipolar disorder has a devastating impact on many people. For those afflicted with the illness, it is extremely distressing and disruptive. Like other serious illnesses, manic-depressive illness is also hard on spouses, family members, friends, and employers. Family members of people with manic-depressive illness often have to cope with serious behavioral problems (such as wild spending sprees) and the lasting consequences of these behaviors.

Almost all people with manic-depressive illness, even those with the most severe forms, can be treated in order to obtain substantial stabilization of their mood swings. One medication, lithium, is usually very effective in controlling mania and preventing the recurrence of both manic and depressive episodes. More recently, the mood stabilizing anticonvulsants carbamazepine and valproate have also been found useful, especially in more refractory bipolar episodes. Electroconvulsive therapy (ECT) is often helpful in the treatment of severe depression and/or mixed mania that does not respond to medications. As an adjunct to medications, psychotherapy is often helpful in providing support, education, and guidance to the patient and his or her family.



Find the plan used in the passage. Use it to write down what you remember on the next page in your packet. The Table on the next page may help you write your recall; try using the template and some signaling words.

Go to previous page	Go to the next page.
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Student's Training Program



Write down as much as you can remember from the passage you have just read. Use complete sentences. You can use the words in the passage or your own words. Do not turn back to the passage after you start writing.

Problem/Solution Writing Plan and Signals that Cue Readers to this Plan

Writing Plan & Definition	Signals
Problem/Solution	
<p>The main ideas are organized into two parts: a problem part and a solution part that responds to the problem by trying to eliminate it, or a question part and an answer part that responds to the question by trying to answer it.</p> <p>e.g., scientific articles often first raise a question or problem and then seek to give an answer or solution.</p>	<p>problem: problem, question, puzzle, perplexity, enigma, riddle, issue, query, need to prevent, the trouble,</p> <p>solution: solution, answer, response, reply, rejoinder, return, comeback, to satisfy the problem, to set the issue at rest, to solve these problems.....</p>

Template for Writing with the Problem/Solution Plan

The problem is Its solution is

The problem is (paragraph(s) include its cause and effect and a description about the problem).....

The solution is (paragraph(s) include a description of the solution and how it gets rid of the cause of the problem or tries to)

Choose the name of the Overall Plan

Write all you can remember from the passage you just read. Remember to write down the main idea sentence and to use the plan to help you remember information from the passage. Remember to check whether what you wrote matches the plan. Type anything you have remembered that you did not include previously.

Your E-mail Address:

Submit

Go to previous page



Go to the next page.



Student's Training Program



Let's check how well you used the strategy.

Did you correctly pick the plan as problem/solution?	Yes No
Write its name as a reminder in the form you completed?	Yes No
Write the main idea sentence?	Yes No
Use the same plan in your recall?	Yes No
Check that you've used it?	Yes No
Add (or try to) anything you'd just remembered?	Yes No
Who are you?	<input style="width: 100%; height: 20px;" type="text"/>

Click the Submit button to send your answer.

Submit

Each answer is worth 1 point.



SCORE:

0 - 2 OH NO!

3 - 4 TUT, TUT! It is good to find the right plan; it is critical to choose and use some plan, rather than just listing ideas.

5 NOT BAD!

6 GREAT!

Go to previous page



Go to the next page.



Student's Training Program



Program Objective: To improve recall by identifying and using the writing plans in reading materials.

Remember that each of the plan has a **special way to pattern** the sentences in a passage.

Problem/solution: The pattern of the Problem/solution plan is that there is part of the passage that tells about a problem (question, puzzle, concern), and another that tells about its solution (answer, reply). In the question/answer version the answer must deal with the ideas discussed in the question and provide some answer. In the problem/solution version often the causes and effects of the problem are discussed first; then, a solution follows that should attempt to block or eliminate at least one of the causes of the problem.

Problem/Solution Writing Plan and Signals that Cue Readers to this Plan

Writing Plan & Definition	Signals
Problem/Solution	
<p>The main ideas are organized into two parts: a problem part and a solution part that responds to the problem by trying to eliminate it, or a question part and an answer part that responds to the question by trying to answer it.</p> <p>e.g., scientific articles often first raise a question or</p>	<p>problem: problem, question, puzzle, perplexity, enigma, riddle, issue, query, need to prevent, the trouble,</p> <p>solution: solution, answer, response, reply, rejoinder, return, comeback, to satisfy the problem, to set the issue at rest, to solve these problems.....</p>

problem and then seek to give an answer or solution.	
--	--

Template for Writing with the Problem/Solution Plan

The problem is Its solution is

The problem is (paragraph(s) include its cause and effect and a description about the problem).....

The solution is (paragraph(s) include a description of the solution and how it gets rid of the cause of the problem or tries to)

-
- Once you have chosen the plan you must use it to organize your written recall. Remember: Choose it, Use it, or Lose it!
 - To use the plan requires your attention before, while, and after you write your recall.
 - While you write put your ideas into sentences and paragraphs that follow the pattern of the plan identified.
 - After you write, check that you used the correct organization, correctly.
 - To use the plan:
 1. write its name on the top of the page where you'll be writing your recall (to help you get organized).
 2. write the main idea sentence (to set up the plan)
 3. arrange sentences and paragraphs to match the plan (keep thinking about how the plan works).
 4. check that you've used it (Ask "Have I discussed the main idea the same way as in the passage?")
 5. write down anything you've only just remembered (It often happens that you think of more information as you are checking).
-



Next you will practice using the strategy with a passage.

Go to previous page **Go to the next page.**



Student's Training Program



Please read the following passage.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Rat Allergies

An occupational hazard for researchers who work with animals is that they often become allergic to the rats and mice used for experiments.

New evidence, presented at a recent meeting in Washington sponsored by the National Institutes of Health, suggests that it is not the fur or skin of these animals that is most to blame, but protein substances in urine.

Dr. Andrew J. M. Slovak, a British physician who spoke at the meeting, said that kindness to the animals may help. Workers who soothe their charges when picking them up to examine them are less exposed to the proteins that can trigger allergies.



Now, please go to the next page to recall the passage you just read.

Go to previous page **Go to the next page.**



Student's Training Program



Write down as much as you can remember from the passage you have just read. Use complete sentences. You can use the words in the passage or your own words. Do not turn back to the passage after you start writing. Write the name of the plan used in the passage. Use it to write down what you remember.

If you need help with the signaling words for the **Problem/Solution Plan**, [click here](#). I will open a new window with **Problem /Solution Plan signaling words**. Use the close box at the top corner of the window to close it when you are finished.

Choose the name of the Overall Plan for the Rat Allergies passage

Write all you can remember from the passage you just read. Remember to write down the main idea sentence and to use the plan to help you remember information from the passage. Remember to check whether what you wrote matches the plan. Type anything you have remembered that you did not include previously.

Your E-mail Address:

Go to previous page Go to the next page.



Student's Training Program



Feedback

1. Did you pick out the organization as problem/solution?

If so, _____ great!

If not,

_____ did you ask the two questions before reading?

_____ did you look for the plan? ("hazard ... is ..allergic to rats", evidence about the cause and suggestion to help eliminate exposure to the cause of the problem: protein in the urine)

_____ did you find the main idea organized by the plan? (the problem of allergies to rats and mice may be solved by kindness to them since kindness reduces exposure to the cause of the problem: protein in urine)

2. Did you write the name of the plan at the top of the recall page?

If so, _____ so far, so good!

If not, _____ mmmmmmm!

3. Did you write down the main idea as the first sentence?

If so, _____ keep it up!

If not, _____ oh no!

4. Did you have two parts in arranging your sentences?

If so, _____ not far to go now!

If not, _____ tut, tut!

5. Were the two parts: one for the problem and one for the solution

If so, _____ I be you remembered a lot!

If not, _____ Oh rats!

6. Did you check?

If so, _____ double smiles!

If not, _____ don't be so overconfident!

Problem/Solution Writing Plan and Signals that Cue Readers to this Plan

Writing Plan & Definition	Signals
Problem/Solution	
The main ideas are organized into two parts: a problem part and a solution part that responds to the problem by trying to eliminate it, or a question part and an answer part that responds to the question by trying to answer it. e.g., scientific articles often first raise a question or problem and then seek to give an answer or solution.	problem: problem, question, puzzle, perplexity, enigma, riddle, issue, query, need to prevent, the trouble, solution: solution, answer, response, reply, rejoinder, return, comeback, to satisfy the problem, to set the issue at rest, to solve these problems.....

Template for Writing with the Problem/Solution Plan

The problem is Its solution is

The problem is (paragraph(s) include its cause and effect and a description about the problem).....

The solution is (paragraph(s) include a description of the solution and how it gets rid of the cause of the problem or tries to)



This is the last page of the training program. Please raise your hand and let the experimenter know that you are done with the on-line training materials and that you can continue working with the rest of the materials/tasks. Thank you for your hard work during the training!

Go to previous page



APPENDIX D. INSTRUCTIONS AND MATERIALS FOR PARTICIPANTS IN THE
CONTROL CONDITION

STUDENT'S PROGRAM

Goal: In this program you will learn how to use HTML (Hyper-Text Markup Language) to create web pages.

You will have 30 minutes to complete a web-based tutorial about creating web pages using HTML. The tutorial includes activities that you must complete. Please read the tutorial carefully.

Following completion of the tutorial, you will have 30 minutes to develop your own web page. For this task, please work in Notepad or Word. You will be required to individually complete this task. You may still review the tutorial if necessary. Remember to email your work to me at est113@psu.edu. It is important that you use as many of the elements you learned about in the tutorial while developing your own web page.

<http://cac.psu.edu/training/Web201/>

The last page of the tutorial is:

<http://cac.psu.edu/training/Web201/sample2.html>

Now, please go to the web-based tutorial and continue working following the directions.

APPENDIX E. THE SCHIZOPHRENIA PASSAGE

Instructions for this Article

For this article you will be asked to (1) underline the most important information for the message of the article; please limit the information you underline to no more than 3 sentences, and (2) **write down everything you can remember**.

Time: _____

The need to change the strange behavior of adult schizophrenics along with improving their ability to communicate is taking form as one of the major problems that psychiatrists must resolve soon. The American Psychiatric Association has proclaimed that psychiatrists must change adult schizophrenics by the end of this century. This action would benefit the largest proportion of hospitalized mental patients, two million schizophrenics. As for improving the communication skills of adult schizophrenics, these confused schizophrenics must learn to stick to goals, state only important ideas, and listen for important ideas. Inhibition by schizophrenics will be needed to increase their use of goals, speaking skills, and listening skills. Inhibition is produced by the ability to prevent thinking about unimportant ideas; that is, the ability to maintain a set. Inhibition is lacking in schizophrenics.

A related problem of equal magnitude is the treatment of children in the nation's mental hospitals with schizophrenia. They need to be treated for their lack of responsiveness, their unusual body movements and their inability to differentiate between self and others. The schizophrenic child has made a fusion of himself with his mother. He is not like the autistic child that never becomes close to his mother after birth. Successful treatment of childhood schizophrenics would drastically reduce agony from their parents.

The anti-s-protein, an enzyme, holds great promise as the solution to these major problems. Anti-s-proteins keep normal people sane. They are completely missing in the brains of adult and childhood schizophrenics, and this lack causes them to be mentally disturbed until the time when anti-s-proteins can be given to them. Proper doses could allow schizophrenics to function normally and return to society. It is in the light of these considerations that Dr. Gottlieb, Dr. Frohman, and Dr. Domino have mounted a

concerted effort to develop the procedures whereby it will be possible to cure the nation's schizophrenics.

S-proteins are potent, unstable proteins called alpha-two-globulin. Anti-s-proteins control the production of the cork-screw shaped s-proteins. Cork-screw shaped s-proteins are the only type of s-protein found in schizophrenics, while the s-proteins of normals are mainly shaped like an accordion. The anti-s-proteins control the s-proteins by shutting off their production and preventing them from becoming abnormal. Anti-s-proteins could lessen the schizophrenic's confusion by stopping production of abnormal s-proteins, and dramatically curtail the schizophrenic's delusional state. Anti-s-proteins, the s standing for schizophrenic or stress, could stop the schizophrenic's hallucinogenic factory in his brain. This delusion factory over produces an essential amino acid for human metabolism, tryptophan, and DMT, dimethyl tyrtamine. Thus, its use would result in a reduction in abnormalities in schizophrenics. It would reduce their strange behavior and trouble communicating. It would eliminate their unrealistic fears and focus on the unimportant.

It has been mentioned that anti-s-proteins keep normal people from thinking and behaving bizarrely. The effect of anti-s-proteins on a normal person calms him down after a crisis. It reduces thoughts to a normal state. After a crisis anti-s-proteins inhibit extreme sensitivity to all noises and sights. Normal amounts of anti-s-proteins have this calming effect.

Time: _____

After you stop reading, please turn to the next page and continue working following the directions.

APPENDIX F. THE TRUSTS PASSAGE

Instructions for this Article

For this article you will be asked to (1) underline the most important information for the message of the article; please limit the information you underline to no more than 3 sentences, and (2) **write down everything you can remember**.

Time: _____

The need to distribute your property while at the same time avoiding court costs is taking form as one of the major financial problems that you must resolve before your death. At your death you want your estate to go to chosen survivors as you desired. As for court costs, avoid the need for probate court to distribute your estate; proceedings of a probate court can be expensive. Probate courts distribute legacies, devises of real property, and residuary property to the spouse, descendants, and charities through an attested will made by the deceased in testamentary capacity.

A related problem of equal magnitude is the need to avoid obstacles in U. S. Courts; these obstacles or hurdles in distributing your estate as you desire include delays in time, the management of your estate by the court, and state laws for equivalent distribution of your wealth. Proceedings of probate court have tied up estates for as long as six years, while the spouse lived without these assets. If you die without a will your estate is distributed to relatives equally.

The trust, a type of will substitute, holds great promise as the solution to these problems because trusts avoid probate court to transfer title of ownership; trusts avoid court costs and delays. In addition, they completely avoid payment of gift taxes and estate taxes, listed in the Economic Recovery Tax Act, to the government at death. Also, trusts enable you to control your property without legally owning it. In light of these financial assets of trusts, Lloyd Copenbarger, Pep Jackson, and others concerned with estate planning have systematically mounted an effort to distribute pamphlets to educate the public about trusts.

In establishing a trust the trustor divides the property into legal and beneficial ownership. The property transferred into a trust is called by a particular term; it is called the corpus of the trust. Legal ownership is held by the trustee and beneficial ownership is held by the beneficiary; the trustee holds the legal title and the beneficiary uses the property so a trust merely divides legal ownership from beneficial ownership. The trustor can change the trust with provisions of a revocable living trust and property is distributed according to the wishes of the trustor. The trustee, such as the trustor's bank, can transfer a deceased trustor's farm, part of the trust's property, to new beneficiaries. The trustor as the former beneficiary would have had the right to all benefits of the property, such as income, and the right to use the property, such as living on the farm. The trustee transfers the beneficiary rights to the farm to the new beneficiaries, such as the deceased trustor's spouse and the deceased trustor's children.

It has been mentioned that trusts avoid court costs and delays because a trust does not have a "life span"; trusts cannot die. Trusts provide transfer of property at your death to chosen individuals without court involvement; trusts allow you to control the use of your property during your life and after death.

Time: _____

After you stop reading, please turn to the next page and continue working following the directions.

APPENDIX G. THE FAST BREEDER REACTORS PASSAGE

Instructions for this Article

For this article you will be asked to (1) underline the most important information for the message of the article; please limit the information you underline to no more than 3 sentences, and (2) **write down everything you can remember**.

Time: _____

The need to generate enormous additional amounts of electric power while at the same time protecting the environment is taking form as one of the major social and technological problems that our society must resolve over the next few decades. The Federal Power Commission has estimated that during the next 30 years the American power industry will have to add some 1,600 million kilowatts of electric generating capacity to the present capacity of 300 million kilowatts. As for protecting the environment, the extent of public concern over improving the quality of air, water, and landscape hardly needs elaboration, except for one point that is often overlooked: it will take large amounts of electrical energy to run the many kinds of purification plants that will be needed to clean up the air and water and to recycle the wastes.

A related problem of equal magnitude is the rational utilization of the nation's finite reserves of coal, oil, and gas. In the long term they will be far more precious as sources of organic molecules than as sources of heat. Moreover, any reduction in the consumption of organic fuels brings about a proportional reduction in air pollution from their combustion products.

The breeder type of nuclear reactors holds great promise as the solution to these major problems. Breeder reactors produce more nuclear fuel than they consume; they would make it feasible to utilize enormous quantities of low-grade uranium and thorium ores dispersed in the rocks of the earth as a source of low-cost energy for thousands of years. In addition, these reactors would operate without adding noxious combustion products to the air. It is in the light of these considerations that the U. S. Atomic Energy commission, the nuclear industry and the electric utilities have mounted a large-scaled

effort to develop the technology whereby it will be possible to have a breeder reactor generating electric power on a commercial scale.

Nuclear breeding is achieved with the neutrons released by nuclear fission. The fissioning of each atom of a nuclear fuel, such as uranium 235, liberates an average of more than two fast (high-energy) neutrons. One of the neutrons must trigger another fission to maintain the nuclear chain reaction; some neutrons are nonproductively lost, and the remainder are available to breed new fissionable atoms, that is, to transform "fertile" isotopes of the heavy elements into fissionable isotopes. The fertile raw materials for breeder reactions are thorium 232, which is transmuted into uranium 233, and uranium 238, which is transmuted into plutonium 239.

It has been mentioned that breeding occurs when more fissionable material is produced than is consumed. A quantitative measure of this condition is the doubling time: the time required to produce as much net additional fissionable materials as was originally present in the reactor. At the end of the doubling time the reactor has produced enough fissionable material to refuel itself and to fuel another identical reactor. An efficient breeder reactor will have a doubling time in the range of from seven to ten years.

Time: _____

After you stop reading, please turn to the next page and continue working following the directions.

APPENDIX H. QUESTIONS ON THE SECOND POST-TEST PASSAGE

Questions on the second post-test passage

Please answer the following questions using your own words or words you remember from the passage.

1. What are the three related problems discussed in the article?

a)

b)

c)

2. What does the author say is the solution to these problems?

3. Give three reasons given by the author to explain why the proposed solution will solve some of the problems.

a)

b)

c)

APPENDIX I. VERBAL ABILITY MEASURE: THE QUICK WORD TEST

Quick Word Test

Fill in the answer space next to the word that means the same as the first word. If you do not know, GUESS. Work quickly. Answer all the questions.

SAMPLE: happy dull seem glad fast

1. chant	dire	<input type="radio"/>	bend	<input type="radio"/>	ring	<input type="radio"/>	sing	<input type="radio"/>
2. talon	hold	<input type="radio"/>	coin	<input type="radio"/>	claw	<input type="radio"/>	peak	<input type="radio"/>
3. salve	mild	<input type="radio"/>	ease	<input type="radio"/>	oleo	<input type="radio"/>	soft	<input type="radio"/>
4. rivet	bolt	<input type="radio"/>	flow	<input type="radio"/>	tray	<input type="radio"/>	part	<input type="radio"/>
5. brook	rill	<input type="radio"/>	fish	<input type="radio"/>	tile	<input type="radio"/>	pool	<input type="radio"/>
6. tight	snug	<input type="radio"/>	skin	<input type="radio"/>	hard	<input type="radio"/>	thin	<input type="radio"/>
7. ratio	fast	<input type="radio"/>	send	<input type="radio"/>	rate	<input type="radio"/>	math	<input type="radio"/>
8. taint	fool	<input type="radio"/>	deny	<input type="radio"/>	tone	<input type="radio"/>	spot	<input type="radio"/>
9. pivot	turf	<input type="radio"/>	turn	<input type="radio"/>	golf	<input type="radio"/>	bore	<input type="radio"/>
10. facet	side	<input type="radio"/>	turn	<input type="radio"/>	easy	<input type="radio"/>	hint	<input type="radio"/>
11. wharf	bark	<input type="radio"/>	dock	<input type="radio"/>	blow	<input type="radio"/>	turn	<input type="radio"/>
12. impel	rain	<input type="radio"/>	urge	<input type="radio"/>	want	<input type="radio"/>	toss	<input type="radio"/>
13. truss	bind	<input type="radio"/>	lift	<input type="radio"/>	road	<input type="radio"/>	cord	<input type="radio"/>
14. roost	bird	<input type="radio"/>	cook	<input type="radio"/>	rest	<input type="radio"/>	male	<input type="radio"/>
15. scoff	hurt	<input type="radio"/>	jeer	<input type="radio"/>	lose	<input type="radio"/>	lung	<input type="radio"/>
16. throb	toss	<input type="radio"/>	love	<input type="radio"/>	wave	<input type="radio"/>	beat	<input type="radio"/>
17. tract	draw	<input type="radio"/>	pull	<input type="radio"/>	area	<input type="radio"/>	pact	<input type="radio"/>
18. azure	pure	<input type="radio"/>	fair	<input type="radio"/>	blue	<input type="radio"/>	fine	<input type="radio"/>
19. waver	disk	<input type="radio"/>	sway	<input type="radio"/>	abet	<input type="radio"/>	foam	<input type="radio"/>
20. check	book	<input type="radio"/>	curb	<input type="radio"/>	menu	<input type="radio"/>	wage	<input type="radio"/>
21. grime	fool	<input type="radio"/>	smut	<input type="radio"/>	tort	<input type="radio"/>	bump	<input type="radio"/>
22. brink	wave	<input type="radio"/>	edge	<input type="radio"/>	bank	<input type="radio"/>	turn	<input type="radio"/>
23. fancy	awry	<input type="radio"/>	wave	<input type="radio"/>	whim	<input type="radio"/>	ogee	<input type="radio"/>
24. greet	vast	<input type="radio"/>	hail	<input type="radio"/>	live	<input type="radio"/>	like	<input type="radio"/>
25. tepid	weak	<input type="radio"/>	thin	<input type="radio"/>	damp	<input type="radio"/>	warm	<input type="radio"/>
26. decoy	lure	<input type="radio"/>	duck	<input type="radio"/>	meek	<input type="radio"/>	send	<input type="radio"/>
27. pound	oval	<input type="radio"/>	lead	<input type="radio"/>	gram	<input type="radio"/>	beat	<input type="radio"/>
28. quack	duck	<input type="radio"/>	snap	<input type="radio"/>	fake	<input type="radio"/>	slap	<input type="radio"/>
29. whoop	loud	<input type="radio"/>	spit	<input type="radio"/>	hoot	<input type="radio"/>	rope	<input type="radio"/>

61. snout	call	<input type="radio"/>	chin	<input type="radio"/>	gush	<input type="radio"/>	nose	<input type="radio"/>
62. vigilant	firm	<input type="radio"/>	cold	<input type="radio"/>	edge	<input type="radio"/>	flat	<input type="radio"/>
63. ardor	gilt	<input type="radio"/>	glow	<input type="radio"/>	fume	<input type="radio"/>	zeal	<input type="radio"/>
64. furor	foam	<input type="radio"/>	flee	<input type="radio"/>	rage	<input type="radio"/>	hate	<input type="radio"/>
65. inter	bury	<input type="radio"/>	mild	<input type="radio"/>	half	<input type="radio"/>	exit	<input type="radio"/>
66. attic	loft	<input type="radio"/>	aged	<input type="radio"/>	high	<input type="radio"/>	isle	<input type="radio"/>
67. eject	stop	<input type="radio"/>	oust	<input type="radio"/>	vote	<input type="radio"/>	pull	<input type="radio"/>
68. sever	hard	<input type="radio"/>	moat	<input type="radio"/>	more	<input type="radio"/>	part	<input type="radio"/>
69. peril	risk	<input type="radio"/>	bead	<input type="radio"/>	dare	<input type="radio"/>	evil	<input type="radio"/>
70. wench	girl	<input type="radio"/>	tool	<input type="radio"/>	hurt	<input type="radio"/>	pull	<input type="radio"/>
71. noose	hang	<input type="radio"/>	nose	<input type="radio"/>	loop	<input type="radio"/>	flay	<input type="radio"/>
72. evict	jail	<input type="radio"/>	oust	<input type="radio"/>	base	<input type="radio"/>	evil	<input type="radio"/>
73. chill	drag	<input type="radio"/>	ague	<input type="radio"/>	wear	<input type="radio"/>	peal	<input type="radio"/>
74. mince	chop	<input type="radio"/>	step	<input type="radio"/>	cake	<input type="radio"/>	meat	<input type="radio"/>
75. nurse	sick	<input type="radio"/>	girl	<input type="radio"/>	lift	<input type="radio"/>	tend	<input type="radio"/>
76. color	tint	<input type="radio"/>	wash	<input type="radio"/>	swan	<input type="radio"/>	book	<input type="radio"/>
77. dogma	male	<input type="radio"/>	dame	<input type="radio"/>	code	<input type="radio"/>	wolf	<input type="radio"/>
78. yield	stop	<input type="radio"/>	cede	<input type="radio"/>	lose	<input type="radio"/>	rush	<input type="radio"/>
79. friar	dupe	<input type="radio"/>	fowl	<input type="radio"/>	monk	<input type="radio"/>	cool	<input type="radio"/>
80. phase	hunt	<input type="radio"/>	word	<input type="radio"/>	side	<input type="radio"/>	spar	<input type="radio"/>

APPENDIX J. OPINIONS ABOUT TRAINING PROGRAM:
TRADITIONAL/CLASSROOM TRAINING CONDITION

Opinions about Training Program

Please circle the responses that apply to you. Circle only one response for each question.

1. Do you feel that you will be able to remember more from your reading in everyday life than you did before you volunteered for this research study?	Yes No
2. Do you feel that you will be able to remember more from your classroom readings than you did before you volunteered for this research study?	Yes No
3. Do you feel that you remembered more after reading passages toward the end in this session than you did reading the passage at the beginning of the session?	Yes No
4. Has your interest in reading increased after this research session?	Yes No
5. Has your enjoyment of reading increased after this research session?	Yes No
6. Do you feel that you will be able to remember different kind of information from your reading in everyday life after this research session than you did in the past?	Yes No
7. Do you feel that you will be able to remember different kind of information from your classroom readings after this research session than you did in the past?	Yes No
8. When you read in this research session did you try to figure out how a passage was organized?	Yes No
9. When you read in this research session did you try to evaluate your interest in a passage?	Yes No

10. Since the beginning of this research session what changes (if any) have you observed in how you read and remember information?

Please circle the responses that apply to you. Circle only one response for each question.

11. Did you like the way the materials were presented on the computer?	Yes Somewhat No
12. Did you find the computerized materials interesting?	Yes Somewhat No
13. What is your opinion about the ease of reading the web-based materials you worked with in this session? Reading the web-based materials was:	Easy Normal Difficult
14. In the future, would you volunteer for research involving computer-based instruction/materials?	Yes Maybe No

What did you like about the training program?

What did you not like about the training program?

What would you change about the program?

Thank you for your participation in the study!

We really appreciate your hard work!!!

APPENDIX K. OPINIONS ABOUT TRAINING PROGRAM: WEB-BASED
TRAINING AND CONTROL CONDITION

Opinions about Training Program

Please circle the responses that apply to you. Circle only one response for each question.

1. Do you feel that you will be able to remember more from your reading in everyday life than you did before you volunteered for this research study?	Yes No
2. Do you feel that you will be able to remember more from your classroom readings than you did before you volunteered for this research study?	Yes No
3. Do you feel that you remembered more after reading passages toward the end in this session than you did reading the passage at the beginning of the session?	Yes No
4. Has your interest in reading increased after this research session?	Yes No
5. Has your enjoyment of reading increased after this research session?	Yes No
6. Do you feel that you will be able to remember different kind of information from your reading in everyday life after this research session than you did in the past?	Yes No
7. Do you feel that you will be able to remember different kind of information from your classroom readings after this research session than you did in the past?	Yes No
8. When you read in this research session did you try to figure out how a passage was organized?	Yes No
9. When you read in this research session did you try to evaluate your interest in a passage?	Yes No

10. Since the beginning of this research session what changes (if any) have you observed in how you read and remember information?

Please circle the responses that apply to you. Circle only one response for each question.

11. Did you like the way the materials were presented?	Yes Somewhat No
12. Did you find the printed materials interesting?	Yes Somewhat No
13. What is your opinion about the ease of reading the instructional materials in your training packet? Reading them was:	Easy Normal Difficult
14. In the future, would you volunteer for similar research studies?	Yes Maybe No

What did you like about the training program?

What did you not like about the training program?

What would you change about the program?

Thank you for your participation in the study!

APPENDIX L. SCORING TOP-LEVEL STRUCTURE PROTOCOL

Scoring top-level structure protocol

1. Random list with no association for grouping.
2. Collection, list overall structure and no mention of problem/solution.
3. Other structure organizes protocol and no mention of problem/solution.
4. Collection, list overall organization, plus mentions problem/solution in sentences.
5. Organized with other structure (comparison, causal), but state problem and solution in one or two sentences.
6. No signal of problem nor solution, but implicit and organized in problem/solution format.
7. Signal only problem and organized in problem/solution format.
8. Signal only solution and organized in problem/solution format.
9. Signal problem and solution and organized in problem/solution format.

6-9: scored as use of top-level structure.

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	B.A. Elementary Education		
	1997-2000	Pennsylvania State University	State College, PA
	M.Sc. Educational Psychology		
Professional experience	1996- 1997	Ministry of Education	Cyprus
	Elementary School Teacher		
	2002- 2006	Ministry of Education	Cyprus
	Elementary School Teacher		
Publications	McNeese, M. D., Theodorou, E. , Ferzandi, L., Jefferson, T., Jr., & Ge, X. (2002). <u>Distributed cognition in shared information spaces</u> . Proceedings of the 46th Annual Meeting of the Human Factors and Ergonomics Society (pp. 556-560). Santa Monica: Human Factors and Ergonomics Society.		
	Theodorou, E. S. (2000). <u>The relationship between self-regulated learning and transfer of problem solving and a reading strategy</u> . Unpublished thesis. The Pennsylvania State University. Pennsylvania.		
	Meyer, B. J. M., Poon, L. W., Theodorou, E. S., Talbot, A., & Brezinski, K. (April, 2000). <u>Effects of Adapting Reading Instruction to Individual Differences of Older Adults</u> . Paper presented at the Cognitive Aging Conference, Atlanta, Georgia.		
	Cawley, J.M., Zimmaro, D.M., Van Meter, P., & Theodorou, E. (April, 1999). <u>Validation of concept maps as a tool to predict performance on course exams</u> . Paper presented at the Annual Meeting of the American Educational Research Association in Montreal, Canada.		
Languages	Greek (Native Language)		
	English (excellent reading, writing, communication skills)		
	French (poor reading, writing, speaking)		
Interests	Transfer/Analogical Reasoning, Use of Learning Strategies, Metacognition, Motivation, Self-Regulated Learning, Learning from Text, Learning with Computers/Use of the Internet in Learning		