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**The Development, Implementation and Formative Evaluation  
of a Workbook on Reading Strategies  
to Facilitate Comprehension of Expository Text**

**Mary A. Hiles**

**A Thesis**

**in**

**The Department**

**of**

**Education**

**Presented in Partial Fulfilment of the Requirements  
for the Degree of Master of Arts (Educational Technology) at  
Concordia University  
Montreal, Quebec, Canada**

**July 1992**

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## **ABSTRACT**

**The Development, Implementation and Formative Evaluation of a Workbook on Reading Strategies to Facilitate Comprehension of Expository Text**

**Mary Hiles**

This thesis equivalent project involved the development, implementation and evaluation of a workbook on reading strategies to facilitate nursing students comprehension of expository text. The development phase focused on a literature review, expert review and one-to-one evaluation. During the implementation phase, volunteer student nurses used the workbook to apply reading strategies when reading and summarizing four pharmacology readings. Each summary received written feedback on selection and organization of main ideas. Qualitative and Quantitative data collected during the field trial suggests that instruction in strategies for selecting and organizing main ideas was effective but that instruction in strategies to activate existing knowledge requires further revision.

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# CHAPTER ONE

## INTRODUCTION AND STATEMENT OF THE PROBLEM

### Context of the Problem

The ability to extract the "gist" or main ideas of text based information is critical to success in nursing education - both academically and in the provision of safe nursing care. Nursing students are required to read pharmacology and other nursing texts in preparation for lectures and clinical practise. At the same time, most student nurses have outside work and/or family commitments so that time for reading is limited and needs to be used efficiently and effectively.

Yet many nursing students in the second year of a C.E.G.E.P. nursing programme have experienced difficulty in comprehension and recall of main ideas of pharmacology and have resorted to the generally unsuccessful strategy of rote memorization of detailed information. Rote memorization often leads to an inability to "see the forest for the trees". For example, students often find it difficult to explain the therapeutic action or rationale for administering a particular kind of medication but can recite many of the potential side-effects of the medication which they have memorized. Attempts to memorize detailed information is not unique to nursing students. Surveys of secondary students' study habits suggest that the majority of students read the text only once with the intent to memorize rather than to actively construct meaning (Tierney, O'Flahaven &

McGinley, 1989). The research on reading comprehension also suggests that readers who have difficulty comprehending text tend to have a limited repertoire of strategies to foster and monitor comprehension (Garner, 1987,1990; Dole, Duffy, Roehler & Pearson, 1991). This suggests that nursing students who have difficulty comprehending texts may not be using their limited reading time efficiently or effectively.

While it may seem most appropriate to recommend that all nursing students who have difficulty comprehending text be enrolled in a learning skills course such as C.E.G.E.P. John Abbott's "Effective Reading and Writing", or to seek guidance at the local learning centre, the reality is that demand exceeds the supply capability of both these resources and few nursing students can receive this kind of help. At C.E.G.E.P. John Abbott, the learning centre has but one professional and one technician for approximately four thousand students. Further, Non-English speaking students are given first priority to courses on effective reading and writing. To compound the problem, the nursing classes tend to be content laden in preparation for national licensing exams, therefore there is little class time available to model or practise reading strategies.

Thus, any direct instruction in strategies for reading comprehension would have to be given primarily through the use of independent learning materials. Practical considerations determined the selection of the instructional media. As the instructional materials are designed for home study; as many student nurses do not have audio or video equipment and the college lacks the resources to meet

the needs of the target audience, the decision was made to use print based media in the form of a workbook.

### Statement of the Thesis Equivalent Problem

Since less skilled readers have a limited repertoire of strategies to foster and monitor comprehension, and there is little time in a professional programme to model reading strategies; will a workbook on reading strategies combined with practise facilitate use of those strategies and improve comprehension?

The goal of this thesis equivalent project is to facilitate student nurses' comprehension of main ideas in selected pharmacology readings through use of reading strategies. To accomplish this goal, Dick and Carey's (1985) systems approach to instructional design was used to develop a workbook on reading strategies. Enabling objectives were determined through a search of the literature and through consultation with subject matter experts at Concordia University and C.E.G.E.P. John Abbott. These objectives were:

1. Understand the reasons for using reading strategies.
2. Apply reading strategies to selected pharmacology readings to facilitate comprehension.
3. Identify those reading strategies that work best to foster and monitor comprehension.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

Recent research in reading comprehension suggests that reading is a complex cognitive process in which the reader constructs meaning through the interaction of the readers existing knowledge, text information and the context of the reading situation (Anthony, Raphael & Pearson, 1989; Dole, Duffy, Roehler & Pearson, 1991). In light of this theory, the learner's characteristics (i.e., domain specific knowledge and knowledge of reading strategies) and the text characteristics contribute to the development of meaning. The following sections provide a review of some of the research in these areas that is relevant to the instructional design and the development of this project.

#### Learner Characteristics

##### Prior knowledge

Research. Prior knowledge is known to influence the reader's comprehension of text (Anderson, Schallert, Reynolds & Goetz, 1977; Afflerbach, 1990). In the Anderson et al. study, it was shown that students' background knowledge of either music or wrestling influenced the interpretation of ambiguous passages. In the Afflerbach study, the presence or absence of domain specific knowledge was shown to influence the type of reading strategies used by skilled

readers to construct the main ideas of a difficult text. Expert readers from anthropology and chemistry read text from familiar and unfamiliar domains. When reading familiar text, expert readers reported a more automatic construction of main ideas, whereas when reading unfamiliar text, readers had to resort to a variety of strategies to identify and paraphrase the main ideas. This would suggest that when learners possess limited subject matter knowledge, comprehension of text becomes more difficult unless they can activate reading strategies to make sense of the text.

Readers must not only possess relevant prior knowledge, but they must also be able to activate it (Ogle, 1986, Duffy & Roehler, 1986; Langer, 1984). Ogle suggests the use of a K-W-L approach to reading - "K" stands for "What do I know already about the topic", "W" stands for "What do I want to learn" and L stands for "What have I learned". Duffy and Roehler advocate asking students to make predictions about content of the text on the basis of domain specific knowledge and knowledge of text structure. Langer's approach is to ask students to make initial associations with key concepts in the text - e.g. "Tell me anything that comes to mind...".

Implications for instructional design. Since the research suggests that students do not automatically activate prior knowledge, a pre-reading strategy to help learners access what they already know should be included in the instruction on reading strategies.

## Knowledge of Reading Strategies

Research. In addition to background knowledge to help make sense of the text, readers also possess to a greater or lesser extent reading strategies to foster and monitor comprehension. Reading strategies can be defined as deliberate goal directed actions to determine meaning when comprehension is interrupted (Kletzien, 1991). According to this definition, reading strategies are a form of problem solving which are used flexibly, adaptively, depending on the level of difficulty of the text. This definition of reading strategies also implies metacognitive awareness of strategy use. This is in contrast to reading skills (for example, decoding a word) which are used almost automatically by good readers to maintain reading speed and accuracy.

Skilled readers intentionally invoke a variety of reading strategies to develop an understanding of the text while less skilled readers have a more limited repertoire (Garner, 1987). Skilled readers tend to use the following strategies:

- 1) select main ideas (determine importance);
- 2) summarize information;
- 3) monitor comprehension and
- 4) draw inferences.

Skilled readers have three levels of knowledge about strategy use: declarative (knowing that); conditional (knowing when); and procedural (knowing how) (Paris, Cross & Lipson, 1984). Kletzien also maintains that skilled readers demonstrate greater persistence in trying different reading strategies when

confronted with difficult text. Finally, skilled readers monitor more accurately the level of comprehension during reading which leads to earlier use of reading strategies.

Less skilled readers, on the other hand do not use reading strategies effectively or often (Garner, 1987; 1990). Less skilled readers prefer to use familiar inefficient routines (for example, rereading the whole text vs. selective reinspection or "Lookbacks"; copy verbatim vs. paraphrasing) that produce a product but do not require deep processing of the text (Brown & Day, 1983; Garner, 1987; 1990). Garner (1990) has also noted that less skilled readers have poor cognitive monitoring (i.e., they do not detect failures in comprehension easily) possibly because of limited criteria for evaluating comprehension (for example, evaluating only the meaning of individual words vs. questioning understanding of main ideas).

### Selecting the Main Idea

Research. Skilled readers are able to select a topic sentence (an explicit main idea statement) or construct the main idea from related ideas when a topic sentence is not present. They are able to determine importance by using domain specific knowledge, knowledge of text structure and reading strategies (Anthony, Pearson & Raphael, 1989; Dole, Duffy, Roehler & Pearson, 1991). Less skilled readers, on the other hand are less able to judge the importance of ideas. Winograd (1984) suggests that this may be due to less skilled readers mistaking

information of high personal interest as having high textual relevance and to difficulty in using textual cues.

While older readers are generally better able than younger readers to select main ideas, at least one study has shown that junior college students experienced difficulty in determining importance of ideas (Brown & Day, 1983; Day, 1986). In this study, when college students were given an expository passage to read, they were able to select only 50% of the topic sentences and were able to construct main idea sentence only on 15% of the occasions when it was appropriate to do so.

Several studies have demonstrated that instruction in main ideas can be effective. Baumann (1984) used a five step direct instruction method to teach sixth graders to select and construct main ideas. In comparison to the control group who received traditional basal reading instruction, the students who received direct instruction were more skilful at comprehending novel reading passages.

Day (1986) taught junior college students of average and below average reading ability how to select and/or construct main ideas using a rule-based approach combined with metacognitive training. These rules were adapted from the Kintsch and Van Dijk theory of comprehension and formed part of training in summarizing. Following instruction, Day found that performance in selecting and constructing main ideas improved for all treatment groups, but low ability readers benefited most from rules plus metacognitive training.



Stevens (1988) compared two methods of instruction (classification vs. identifying the topic sentence) to teach remedial readers in grades 6 to 11 to identify main ideas of expository passages. Students who received training in selecting the topic sentence outperformed the other treatment group and the control group, in judging main ideas in training content passages and novel passages.

Implications for instructional design. Since less skilled readers have difficulty in determining importance among ideas, strategies for finding the main idea need to be explicitly described in the planned instruction. As well, opportunities to practise identifying main ideas from text combined with written feedback of selected main ideas need to be given. Strategies to find the main ideas may include: where to look for topic sentences and turning headings into questions and reading to answer the question.

### Summarizing information

Research. Summarizing information can be defined as a synthetic activity for which determining importance is a necessary but not a sufficient condition (Dole, Duffy, Roehler & Pearson, 1991). A summary is not viewed as an automatic outcome of comprehension. It involves additional cognitive procedures to determine the relative importance of ideas (Brown & Day, 1983; Winograd, 1984). These cognitive processes include selecting important information,

condensing material through use of super-ordinate terms and integrating information into a coherent and accurate representation (Hidi, 1984).

Summarizing is thought to facilitate learning in two ways: it helps learners clarify meaning and helps them to monitor comprehension (Hidi & Anderson, 1986; Palinscar & Brown, 1984).

Wittrock and Alesandrini (1990) found that when undergraduate students were asked to write summaries in their own words, comprehension was enhanced. They found that summaries assist the student in generating relations among text propositions and in constructing relations between the text and the learner's knowledge and experience by stimulating the learners analytical abilities (ability to abstract a common dimension among stimuli) and spatial-holistic abilities (ability to construct a whole from information about its parts).

Summarizing can be a difficult task for less skilled readers. While skilled readers can select main ideas, condense material and combine idea units across paragraphs, less skilled readers have a difficult time both in selecting main ideas and in synthesizing ideas into new combinations (Garner, 1987; Hidi, 1984; Winograd, 1984). Day (1986) found that telling less skilled readers to make summaries as brief as possible and to omit unnecessary information was not explicit enough to guide them in summarizing. This may be because less skilled readers have a strong preference for a primitive "copy delete" strategy and do not understand the unique status of the topic sentence as a scaffold for summarizing (Brown & Day, 1983; Garner & McCaleb, 1985).

Summarizing appears to be a strategy that can be learned. Brown and Day (1983) and Day (1986) have proposed explicit summarization rules: delete redundant, trivial materials; substitute superordinate terms where possible; select topic sentences or invent topic sentence where none exist. As Hidi points out these rules do not encompass all cognitive operations to synthesize information in a summary. Nevertheless, instruction in rule use was found to improve college students' ability to summarize expository passages. Hare and Borchardt (1984), however, found that rule use was ineffective for identifying implicit main ideas, perhaps because their training in summarization was not linked to other strategies that activated existing knowledge or text structure knowledge.

Reinhart, Stahl and Erickson (1986) instructed sixth graders in ways to summarize the main ideas. Students who received training took notes that contained more important ideas and showed improved ability to summarize main ideas in novel passages.

Finally, Hidi (1986) suggests that an important instructional consideration is the difference between teaching students to write summaries for themselves (writer-based summaries) and for others (reader-based). Hidi cites several advantages to teaching "writer based" summaries. First, it is a strategy that can be used throughout life for understanding text. Second, such summaries can be used for personal studying. Third, writer-based summaries are easier to prepare than reader-based summaries. This is an important factor in light of the time constraints of most nursing students.

Implications for instructional design. Given that summarizing is a difficult, potentially time consuming task, it is essential to provide guidelines to help students integrate main ideas effectively and efficiently. Guidelines for outlining and or mapping may be appropriate ways for nursing students to represent the relationship of ideas from expository text. As the summaries are primarily intended for personal learning, strict rules for presentation and page length should be avoided. It is also important to show students the benefits of a succinct summary - it facilitates recall for tests and it shows clearly the relationships among ideas. Finally, students should be encouraged to use their own words in addition to/or in place of more concise technical terms if this enhances meaning even if this makes the summary somewhat longer.

#### Strategies to Monitor Comprehension

Research. Metacognitive skills and effective reading may be related (Baker & Brown, 1984; Garner, 1987; Wong, 1985; Anthony, Pearson & Raphael, 1989; Dole, Duffy, Roehler & Pearson, 1991). Metacognition refers to knowledge of the factors that affect learning activity as well as control of these factors (Baker & Brown, 1984). Skilled readers tend to anticipate problems, to have multiple standards for self evaluation, to be sensitive to triggering events that indicate failure in comprehension and to have a greater variety of repair strategies to remedy problems in comprehension (Garner, 1987; Baker & Brown, 1983; Baker, 1985).

Less skilled readers, on the other hand, are less aware of triggering events (e.g., inconsistencies in text) and comprehension deficits, proceeding on "automatic pilot" oblivious to comprehension deficits. This is possibly because they have fewer criteria for monitoring comprehension and have fewer "fix it" strategies (Baker, 1985; Palinscar & Ransom, 1988; Garner, 1987).

Several studies have shown that instruction in metacognitive strategies can improve comprehension. For instance, Dewitz, Carr and Patberg (1987) investigated the effect of inference training on comprehension monitoring. Students who received training showed increased awareness of comprehension difficulties and increased variety of strategies (e.g., selective rereading, considering the sense of answers using background knowledge) to overcome deficits.

Palinscar and Brown (1984) used a reciprocal teaching method to instruct seventh grade poor readers in four comprehension monitoring strategies (summarizing, self-questioning, predicting, and clarifying unclear text). Students who received training showed significant improvement in the level of performance on daily comprehension tests. Lastly, Day (1986) found that for poor college readers, summarization training coupled with metacognitive routines was the best approach. When metacognitive training was used in isolation, Day found that it did not improve comprehension.

Other researchers have found that explicit explanation of rationale for metacognitive strategies increased strategy use (Duffy & Roehler, 1987; Paris, Cross & Lipson, 1984).

Implications for Instructional design. Given that the purpose of metacognitive strategies is to help the learner be in control of the reading activity, it is important to have metacognitive routines embedded in the pre-reading, reading and post-reading stages. For instance, having readers make predictions about the content will, hopefully, sensitize readers to triggering events in the text. Using questioning during reading and the process of summarization is another way to monitor comprehension.

### Drawing Inferences

Research. Drawing inferences or conclusions when reading helps learners to construct meaning from the text (Paris, Wasik & Turner, 1991). Readers use inferencing to fill in details omitted in text and to elaborate (i.e., form a relationship between existing knowledge and new unfamiliar material) what they read (Dole, Duffy, Roehler & Pearson, 1991). Readers can be taught to enhance inferencing abilities. For instance, Hanson and Pearson (1983) instructed good and poor fourth grade readers in reasons for making inferences, how to use prior knowledge and how to ask inferential questions. Poor readers benefited from the instruction while good readers did not.

A second way to draw inferences is to think of an example using the factual information from the text. Hamilton (1988) investigated the effects of using personal examples on undergraduate students abilities to learn psychology concepts from prose. Hamilton found that students in the treatment group

significantly outperformed the control group on problem solving measures but not on recall of minor factual information.

Implications for instructional design. To consolidate student learning, it seem appropriate to ask nursing students to think of examples of patients and how they would apply the pharmacology information they have read. This could be a post-reading strategy.

### Knowledge of text Structure

Research. Text structure can be defined as the way ideas are organised in text to convey a message to the reader. Authors often use text structure to highlight the relationship of ideas. Examples of text structure used to emphasize main ideas include headings, italics, topic sentences and signal words such as "important".

Several studies have shown that sensitivity to text structure can help readers build a mental representation of the relationship among ideas and hence improve comprehension and recall of reading from expository text. For instance, Armbruster, Ostertag and Anderson (1986) found that fifth grade students who were given training in the typical structure (problems/solution) of a social studies text as well as training in summarization outperformed a control group in recalling the main ideas of a social studies passage. Similarly, Cook and Mayer (1988)

identified a structural schema for understanding a scientific text. College students who were trained in this schema had a significantly better recall of main ideas.

Roller (1990) cautions, however, that the influence of text structure on comprehension is greatest with moderately unfamiliar text. If the text is already familiar, then relations between ideas are already known and structural cues are redundant. If the text is very difficult, the reader will be unable to discover the relations among ideas just by using text structure cues.

Implications for Instructional design. As a pre-reading strategy, it seems appropriate to have students:

1. recall the typical structure of any pharmacology text For example, the mechanism of action, therapeutic uses, and adverse effects are the usual subdivisions. This knowledge of usual text structure can be used when making predictions about the content of the text;
2. survey the reading for structural cues that indicate main ideas and,
3. look for explicit topic sentences to find main ideas.

### Text Characteristics

Research. Hidi and Anderson (1986) and Garner and McCaleb (1986) have observed that the task demands of summarizing are closely related to the



characteristics of the text. Text characteristics include length, genre (narrative or expository) and complexity. Long expository text that contains difficult or new vocabulary, elaborate sentence structures, inappropriate organization and unfamiliar concepts is more difficult even for adult readers to summarize (Hidi, 1984).

Implications for instructional design. While students are developing abilities in reading strategies, they should be given shorter, less complex texts to read. Because the students' pharmacology text was judged to be on the grade 16 reading level using the Fry readability formula, other pharmacology readings should be used in the early stages of practise.

**CHAPTER THREE**  
**METHOD - DEVELOPMENT AND IMPLEMENTATION OF THE**  
**INSTRUCTIONAL STRATEGY AND EVALUATION DESIGN**

**Development and Implementation**

To help students construct meaning from texts, it was decided to provide direct instruction in the use of reading strategies through the use of a workbook combined with practise and written feedback on student selection of main ideas as presented in writer based summaries.

The development of a workbook on reading strategies was based on Dick and Carey's (1985) systems approach to instructional design.

**Identifying the Instructional Goal**

The instructional goal "To facilitate comprehension of main ideas of pharmacology through use of reading strategies" was derived primarily from observations made by the researcher while teaching student nurses in the hospital setting where they prepare and administer medications. Many students are unable to describe the most important ideas of the pharmacology readings they have completed and hence are unsure of the nursing assessments to make before and after administering medications.

Survey on Learning Methods and Abilities. A survey instrument to determine learning methods and abilities when studying pharmacology was completed by twenty-seven volunteer students enrolled in the fourth semester nursing (second year) and the four faculty members who teach the nursing course (see Appendix A, Figure 7, page 89).

Approximately 70% of respondents felt that "They get lost in the details when studying pharmacology" (Item 12) and 64% believed that they had "Trouble figuring out just what to do" to learn pharmacology (Item 5). Similarly, 52% of students indicated that they tend to concentrate their efforts on memorizing details about specific drugs (Item 8) and 41% of students believe they have difficulty distinguishing between more important and less important information when reading pharmacology text (Item 6). Approximately 40% of students reported taking a lot of detailed notes when studying pharmacology (Item 3).

On the other hand, approximately 70% of students believed they were able to explain the most important ideas of a classification of drugs (Item 4) and 82% use their existing knowledge to guide their learning of new pharmacology (Item 7).

Faculty responses indicated a divergence of opinion on whether students are able to distinguish between more important and less important information (three of four teachers felt students did not distinguish between more important and less important information). As well, two of four teachers did not find that students were able to explain the most important ideas of a classification of drugs. It would appear that faculty members are split amongst themselves on the

question of students' ability to select important information when reading and do not share the perceptions of the majority of students on this issue.

Although any conclusions should be drawn with caution, as validity of this questionnaire has not been tested against other instruments, the results of the survey tend to confirm the observations made in the clinical area that the majority of students have difficulty comprehending pharmacology readings. Therefore, the instructional goal of facilitating comprehension through use of reading strategies is appropriate for the target audience.

### Instructional Analysis

To determine the variety of reading strategies that expert readers use to comprehend text, a search of the literature was conducted and learning specialists at Concordia University (Guidance and Counselling) and C.E.G.E.P. John Abbott College (Learning Centre) were interviewed. The purpose of the interviews was to determine appropriate strategies as well as to identify practical ways to operationalize strategies.

The reading strategies that were identified as essential to foster and monitor comprehension are as follows:

- 1) finding the main ideas:  
procedural steps: activate prior knowledge, survey the reading using text structure as cues, actively read small chunks of text for main

- ideas by looking for topic sentences or by turning headings into questions and reading actively to find the answer to the question;
- 2) summarizing information:  
procedural steps: select main ideas, relate supporting ideas to main ideas in an outline or map;
  - 3) monitoring comprehension:  
procedural steps: make predictions about the content, be alert to triggering events, use strategic backtracking to clear up points of confusion, paraphrase main ideas in own words, verify the relationship of supporting ideas to main ideas in the summary and
  - 4) drawing inferences:  
procedural steps: use examples from nursing practise, ask what the implications are for nursing practise.

### Entry Behaviours and Characteristics

The entry behaviours of the student sample deemed important to identify are the student learning and study strategies related to reading, and ability to summarize a short pharmacology passage. Important entry characteristics include reading comprehension level, maternal language and educational background. To obtain this information, the following assessment tools were administered to twenty-seven volunteer student nurses in a second year nursing course. Prior to

administration, the purpose of the formative evaluation project was explained and written consent to participate was obtained.

### 1. Demographic survey

The questionnaire on learning methods and abilities when studying pharmacology included two demographic questions on maternal language and highest educational qualification (see Appendix A, Figure 7, Items 13 and 14). The results indicated that the maternal language was English for 63% of students. French was the maternal language for 18% and other languages (Cree, German, Czech, Spanish, Darian) accounted for 18%. Because approximately 37% of students are studying in a second language, additional effort is likely needed to comprehend texts.

On the other hand, 37% of students have an educational background outside of nursing (29% have already attained a D.E.C. or college diploma and have returned to complete a professional programme). Given this background of academic success, it may be that instruction in reading strategies would act as a reinforcement of learning skills for this particular group. Overall, it can be seen that this class of students is not homogenous.

### 2. Nelson Denny Comprehension Test

The comprehension test component of Form B of the Nelson Denny Reading test was administered during a regularly scheduled class. A time limit was

not imposed, but all students completed the test within one half hour. The results of this reading test indicated a fairly even distribution in reading comprehension ability. Nine students of twenty-seven had raw scores of less than 44 (less than 59% for grade thirteen, indeed six of the nine had scores below 50% comprehension) while seven students had raw scores above 60 (greater than 90% comprehension). The remaining eleven students had raw scores ranging from 45 to 58 (60-89% comprehension). Therefore, on the basis of this measurement, one third of the sample has extreme difficulty comprehending text, one third has moderate to little difficulty with comprehension, and the top third has little to no difficulty with comprehension.

### 3. LASSI (Learning and Study Strategy Inventory)

The LASSI is a commercially available self report instrument consisting of 77 items that use a Likert scale response format to measure students use of learning and study strategies and methods (Weinstein, 1987). The LASSI yields individual scores on ten subscales of which four pertain to this project: information processing (use of elaborations, comprehension monitoring, reasoning), selecting main idea (ability to pick out important information), self-testing (comprehension monitoring) and study aids (use of text structure, creating summaries, diagrams). After reading each item, the student responds that the statement is not at all typical (1), not very typical (2), somewhat typical (3), fairly typical (4) or very much typical (5). Some items are stated in a positive direction, and others are

stated in a negative direction. Construct validity was determined through obtaining the judgements of experts about the appropriateness of the items and by comparison of scale scores with other tests and performance measures (Weinstein, 1987). The LASSI scores can be compared to American national norms or local norms. C.E.G.E.P. John Abbott uses the 50% cut off scores of the American national norms because experience has shown that students tend to rate themselves harshly when completing this test. Because the test is under copyright protection, it was not included in the appendices.

The LASSI was administered and scored according to the procedures outlined in the LASSI User Manual. The results of the LASSI indicated that approximately one-third (9/27) rated themselves below the 50% norm on information processing and self-testing. In addition, approximately one-half of respondents scored below the 50% norm for selecting main ideas and use of study aids. This may indicate that one-third to one-half of the volunteer student sample perceive themselves as having some difficulty fostering and monitoring comprehension.

#### 4. Summarizing a Short Pharmacology Passage

The students were asked to summarize a short (350) word passage on laxatives. No specific instructions on how to summarize were given. The summaries were evaluated by using an adaptation of a marking scheme for concept maps (Gowin & Novak, 1987) (see Appendix B).



No glaring differences were observed in the summaries produced by high and low reading ability students. All students identified the most important ideas. Subordinate ideas were clearly linked to main ideas and the presentation did not deviate from the original text for 26 of 27 summaries. These results can be at least partly explained by the selection of the text. The shorter the text, the more likely that the ideas are closely related and can be expressed by a single topic sentence. A longer text would have increased the demands of summarizing and perhaps led to greater differences (Hidi & Anderson, 1986).

### Performance Objectives

The performance objectives for the instructional workbook were derived from the literature review and discussion with the learning specialists.

1. Understand the reasons for using reading strategies.
2. Apply reading strategies to selected pharmacology reading to facilitate comprehension.
3. Identify those reading strategies that work best to foster and monitor comprehension.

## Development of the Instructional Strategy

The nursing course in the fourth semester is content laden, hence there is little opportunity to provide in-class modelling or practise of reading strategies. Additionally, it takes time to develop or refine one's use of reading strategies. For these two reasons, it was decided to develop a workbook on reading strategies which students could use when summarizing four pharmacology readings over the course of the semester (see Appendix H). Written feedback on selection and organization of main ideas was supplied after each summary was submitted. The rationales for providing feedback include error correction (in this case, identification of missing main ideas) and reinforcement (Bernard & Nadu, 1992).

## Design of the Workbook Content and Structure.

The workbook on reading strategies was developed on the basis of the literature review and in consultation with two subject matter experts (SMEs) who are learning specialists at C.E.G.E.P. John Abbott and Concordia University. The workbook consists of six reading strategies. Each strategy has a section on background information which provides the rationale for use; a section on "how to" directions to use the strategy with examples and a section which includes an exercise to complete with space to note feedback from the introductory in-class group discussion.

## SME Contributions to Content Development

The assistance of the learning specialists was sought to help translate the results of the literature search into practical reading strategies. They made the following significant contributions to early drafts of the workbook.

Strategies for Selecting the main idea. The early drafts of the workbook contained four techniques for finding the main ideas (for example using lexical cues such as "Most Important" and searching for the "Most general statement" in addition to looking for explicit topic sentences and turning headings into questions). The result was a cumbersome lengthy section which needed pruning. The learning specialists' guidance was invaluable in this task. In their experience, only two techniques have proven to be useful (looking for explicit topic sentences and most importantly, turning headings into questions). Lexical cues have been found to be misleading, as authors do not always use them in a topic sentence. Instructions to search for the most general statement was found to be too vague. Therefore, these two techniques were eliminated in later drafts.

Next, the learning specialists criticized as unwieldy the proposed techniques to construct a topic sentence for a paragraph or chunk of text (when an explicit topic sentence did not exist). It was recognized that it was difficult to articulate succinctly the mental processes involved in combining subordinate idea units into an overall statement. As a result, subsequent drafts have only a simple statement that not all paragraphs contain explicit topic sentences and it is sometimes

necessary to write a main idea statement using supporting ideas. No specific guidance is given as to how to do this.

Finally, and perhaps most importantly, the learning specialist at Concordia pointed out the need to encourage students to read actively for main ideas in short chunks of text (about 3-5 minutes) and to avoid underlining until the reading is completed and the student can verbalize the main ideas. In her experience, students are indiscriminate underliners in the first reading, feeling perhaps that they will go back and find the main ideas at a later date. It was acknowledged that this may be a difficult habit to break, because as Garner (1987) points out, primitive inefficient routines get the job done.

Strategy for summarizing. The learning specialists emphasized the importance of constructing a summary that is organized in a pattern with main ideas clearly identified and related ideas clearly linked to main ideas, since this enhances recall. The Concordia specialist advocates the use of "structured pattern", a form of mapping which has proven to be popular with undergraduates. On the other hand, the John Abbott specialist has found that mapping to be used only by skilled readers and that outlining is preferred. As a result, both techniques for summarizing are given in the workbook with the expectation that outlining would be more likely used.

Strategies for monitoring comprehension. The Concordia learning specialist has found that making predictions helps to activate comprehension monitoring. When the meaning of the text does not match expectations, this tends to alert the

student to use repair strategies such as text reinspection. Making predictions was added as a pre-reading strategy.

### Implementation

During a regularly scheduled class, volunteer students were given the workbook and a pharmacology article on anti-anginals medications (the required pharmacology text was not used for practise readings because it is a difficult text to read and the students have a strong antipathy to it). Each strategy in the workbook was introduced by the instructor and the related workbook exercise using the assigned reading was completed in class by the students. Feedback was given by the students through discussion and to a lesser extent by the instructor.

At the end of the class, students were asked to use the reading strategies when summarizing the remainder of the pharmacology article at home. Written feedback on selection and organization of main ideas in each summary was given.

During the following eight weeks, the students were invited to read three other pharmacology readings that related directly to course content and to submit summaries. Again, each summary was given written feedback.

## **Formative Evaluation Design**

An adaptation of Dick and Carey's (1985) model for formative evaluation was used to complete a formative evaluation of the instructional strategy for teaching reading comprehension strategies. Formative evaluation may be defined as a process whereby information is acquired in order to judge the merits of instruction during the developmental stage and to revise where needed in order to make the instruction more efficient and effective (Dick & Carey, 1985; Popham 1975; Patton 1990; Geis 1987; Weston, 1986). The underlying assumption is that if student performance does not live up to expectations, it is the materials not the students that are at fault (Russel & Blake, 1988).

The formative evaluation consisted of three phases:

1. one-to-one evaluation;
2. expert review and
3. field evaluation.

### **Goal of Formative Evaluation**

The goal of the formative evaluation was to gain an understanding of the overall strengths and weaknesses of the instructional approach to reading strategies in terms of its ability to meet the learning needs of the target population in order to identify key variables for revision and further study.

## Objectives

The specific objectives of this formative evaluation were:

1. To determine the accuracy and completeness of the content of the workbook;
2. To assess the instructional effectiveness as evidenced by self reports of reading strategy use by students of different reading level ability and changes in LASSI scores.
3. To assess the attitudinal response of students to the instruction on reading strategies.
4. To obtain feedback on the technical elements of the workbook.

## Method

A variety of methods were used during the phases of evaluation in an attempt to obtain different types of information on the same evaluation questions. Quantitative methods were intended to provide an overview of learner responses and attitudes. Qualitative methods were intended to identify patterns and themes of the learners's experience that could not be measured quantitatively.

Figure 1 (page 32) illustrates the methods used in relation to the objectives and phases of evaluation.

OBJECTIVES	EVALUATION PHASE	INSTRUMENT
Determine content accuracy and completeness	Expert review  One-to-One  Field trial	questionnaire and interview  guideline for discussion  questionnaire interview
Assess instructional effectiveness (reading strategy use)	Field trial	LASSI questionnaire #1 (part A) summary feedback interview
Assess attitudinal response to instruction	One-to-One  Field trial	discussion  questionnaire #1 (part B) interview
Obtain feedback on technical elements	Expert review  One to One  Field trial	questionnaire and interview  guideline and discussion  questionnaire #2

Figure 1: Evaluation methods associated with objectives and phase of evaluation



## Phases of the Evaluation Procedure

### One-to-One Evaluation

#### Participants

In this phase, three participants (two medium and one low ability reader) were asked to read an early draft of the workbook and apply the instructions in reading strategy use to a short passage in the presence of the evaluator. The purpose of this phase of the evaluation was to detect and eliminate difficulties in level of vocabulary and sentence complexity, errors in the instruction of the tasks to be performed and adequacy of the examples.

The rationale for using students of different reading abilities is that students of higher aptitude have been found to be more adept at pinpointing inaccuracies in the instruction and to be able to provide steps of instruction that may be missing while low aptitude learners tend to identify basic problems such as vocabulary (Wager, 1983).

#### Instrumentation

To elicit student responses and facilitate discussion, a guideline was developed based on Dick and Carey's approach to one-to-one evaluation (see Appendix C). Student reactions and responses were noted on the draft workbook and some modifications to instructions were made immediately and retested.

## Criteria

The criteria for change included:

- 1) vocabulary: the choice of words must be appropriate to low level readers
- 2) sentence structure: sentences should not be viewed as overly complex and long.
- 3) information presentation: main points should have high visibility
- 4) explanations should be clear and complete

## Expert Review

The primary role of the subject matter expert is to review the instructional materials for accuracy and comprehensiveness of the content, as well as the "Flow" or sequencing of content (Dick & Carey, 1985; Geis, 1987; Weston, 1986). A secondary role may be to provide expert opinion on the depth of the instruction if the SME has an understanding of the target population (Geis, 1987).

## SME Participant

In this evaluation study, the subject matter expert selected to review the completed workbook was the learning specialist at C.E.G.E.P. John Abbott who is knowledgeable about reading strategies and the target audience.

### Instrumentation

The subject matter expert was asked to respond in writing to twelve open-ended items on a written questionnaire (see Appendix D). An informal interview was conducted to elicit any further comments or suggestions by the subject matter expert.

### Criteria

Criteria for change included :

- 1) Description of reading strategies should be accurate and complete;
- 2) The content should flow logically and
- 3) Examples should illustrate the strategy.

### Field Testing

Field testing may be defined as a process where a larger population of learners are involved in the evaluation of educational materials that are more fully developed than at the one-to-one stage. Student data are collected under close approximation or actual conditions of use. The purpose of this stage of evaluation is to determine if the instruction is effective in the environment for which it was intended (Dick & Carey, 1985).

### Participants in the Field Test

The target audience is C.E.G.E.P. level nursing students. Twenty-seven second year students in a C.E.G.E.P. level nursing programme volunteered to participate in the field trial.

### Instrumentation

Four measures were used to measure the effectiveness of the instructional strategy: comparison of pre/post LASSI scores, a questionnaire on reading strategy use, summaries, and interviews of selected students. The questionnaire and interviews were also used to determine content accuracy/completeness and attitudinal response to instruction.

#### 1) Learning and Study Strategy Inventory (LASSI)

As previously described, The LASSI is an assessment tool that measures students use of learning strategies. The focus is on student thought processes and behaviours that relate to successful learning and that can be altered by instruction (Weinstein, 1987). Four of the ten subscale scores were used as a pre/post measure to assess for changes in learning strategies following instruction in reading strategies:

Information processing (INP). Meaningful learning is enhanced by the use of elaboration and organization strategies. Elaboration activities include activating prior knowledge to make sense of new information and use of examples.

Organization strategies include summarizing, and paraphrasing to arrange new

information meaningfully. As the workbook included reading strategies for activating prior knowledge, summarizing and using clinical examples to draw inferences, differences in pre/post scores in INP may indicate whether instruction had any effect on students ability to process information when reading.

Selecting main ideas (SMI). Effective reading requires the student to be able to select the main ideas in texts. The workbook on reading strategies provided two ways for identification of main ideas, therefore, it was deemed necessary to know if instruction in reading strategies assisted students to "separate the wheat from the chaff".

Study aids (STA). Study aids is a term Weinstein uses to describe both the use of text structure (for example use of semantic and lexical cues) and individually created students aids such as charts, diagrams, or summary sheets intended to make reading meaningful. As the workbook included strategies for using text structure to identify main ideas and summarizing, differences in STA scores may indicate effectiveness in instruction.

Self-testing (SFT). Self-testing refers to reviewing and testing one's level of understanding (Weinstein, 1987). These strategies are used for knowledge acquisition and comprehension monitoring (Weinstein). As the workbook provided instruction in self questioning during reading and after summarizing, differences in SFT indicate student awareness of the need to monitor comprehension.

As mentioned previously, the LASSI was administered and scored according to directions in the LASSI User Manual.

## Criteria

Changes in LASSI scores were used as a broad indicator of the effectiveness of the instruction. If post instruction LASSI scores remained the same or declined (particularly with low or medium ability readers), this signaled that components of the workbook require improvement. Follow-up item analysis was performed to isolate particular elements of the workbook that need revision. Validation of the results of this data collection was sought in other field trial results.

## 2. A Questionnaire on Reading Strategy Preferences and Attitudes

The questionnaire had two sections. In the closed-ended response section, students were asked to rate, using a Likert scale format, each reading strategy according to how helpful it was in fostering and monitoring understanding (see Appendix E). In addition to identifying those reading strategies deemed to be helpful and those not helpful, it was hoped that differences in reading strategy preferences among learners of different reading abilities would emerge.

The open-ended section of the questionnaire asked students for their overall opinion of reading strategies; whether the instruction caused any change in strategy use; and whether reading strategies were used in other contexts (see Appendix E). The purpose of this section of the questionnaire was to identify the attitudinal response to instruction.

### Criteria.

The criterion for workbook revision in the close-ended response section was a 75% (12-13 students of 16) response that the strategy was either "Very helpful" or "Helpful". If less than 75% of students select these response options for a particular strategy, this was taken to indicate a need for workbook modification.

The criteria for the open-ended response section were that the majority of students should report use of reading strategies in other contexts and have a positive attitude to the method of instruction.

### 3. Interviews with Participants of Different Reading Abilities

The purpose of interviewing was to capture, in the participant's own words, her perceptions and experience. This was done to develop an understanding and "illuminate" the learning process so that some conclusions may be drawn about the effectiveness of the instruction (Patton, 1990).

Patton describes three approaches to collecting qualitative data through open-ended interviewing: 1. the informal conversational interview; 2. the general interview guide approach, and 3. the standardized open-ended interview.

The general interview guide approach to interviewing was selected. In this approach, topics and issues to be covered are specified in advance (unlike conversational interviewing where questions emerge from the immediate context) but the sequencing and wording of the question are decided upon in the course of

the interview (unlike the standardized open ended interviewing where the exact wording and sequencing of questions are determined in advance). The reasons for selecting this approach were to:

1. increase the comprehensiveness of the data and to make the data collection somewhat systematic for each interview. It was hoped that a guideline for topics would encourage the learner to respond descriptively about their experience and,
2. have the interviews remain fairly conversational and situational so that unanticipated important topics may be explored (Patton, 1990).

An interview guide was developed to provide a framework for the content of the interview (Appendix F). Using the guideline, the researcher attempted to ask open-ended questions in order that the participant could respond descriptively about her experience.

Nine interviews were conducted. Four interviews were with low ability readers, three with medium ability readers and two with high ability readers. The interviews opened with a general question and then more specific questions were asked about strategy use. Interviews lasted from twenty to forty minutes. The interviews were recorded and transcribed. To identify significant patterns in the data, a cross case analysis was attempted in which responses from different interviewees were coded and grouped by topics and categories using the interview guide as a framework. To enhance the quality of analysis, two people analyzed the data separately and compared findings.



Constraints. At least two constraints exist in this method of data collection. First, the interviewer's flexibility in sequencing and wording the questions may result in substantially different responses, thus reducing the comparability of responses (Patton, 1990, p.288). Second, the interviewer was a classroom teacher of all the interviewees. It was important to maintain the rapport with the interviewee yet not violate the neutrality concerning what the interviewee said so that she would feel free to report any and all perceptions of the learning experience.

### Criteria

Three criteria were used to evaluate the interview data. First, as a measure of instructional effectiveness, students description of strategy use before and after instruction was compared. If a greater variety of strategies were used following instruction, this would indicate that the instruction was effective. Second, as a measure of attitudinal response to instruction, student overall opinion of reading strategy use was elicited. If the majority of students have a positive opinion, this was considered indicative of a positive response to instruction. Finally, as a measure of instructional accuracy and completeness, student recommendations for improvement were elicited. If a number of students made similar recommendations, this was used, in conjunction with other findings, for future revisions.

#### 4. Evaluation of Summaries

While the primary purpose of the summaries written by participants was to provide practise (with feedback) in the use of reading strategies in order to facilitate comprehension, a modest secondary gain was the opportunity to assess the degree to which participants were able to select and organize the main ideas from a prose passage. Thus, the summaries became a type of process measure which indicated to a limited extent the responses of the students to the educational materials (Kandaswamy, 1980).

The same guidelines that were used to evaluate the entry level summary was used for content analysis of the summaries (see Appendix B). The unit of analysis was both at the phrase/sentence level and at the whole text level. The following steps were used for analysis at sentence level:

- A. Were all main ideas selected?
- B. If related ideas were selected, were they subsumed under a main idea?.

The following steps were used for analysis at the whole text level:

- A. What was the method of summarizing (outlining, mapping, other).
- B. Was the overall presentation clear and logical?
- C. What was the length of the summary?

The summaries were given written feedback and evaluated by the researcher. The obvious constraint of this procedure is a risk of bias.

### Criteria

Instructional effectiveness was indicated by students' ability to select most or all main ideas, to subsume related ideas under main ideas and to summarize clearly and succinctly.

### 5. Questionnaire on Technical Elements

To assess the adequacy of the technical elements (such as clarity of instruction, use of examples and feedback), a short open-ended questionnaire, similar to the one used for the one-to-one evaluation was distributed to the students towards the end of the field trial (See Appendix G). This questionnaire was completed outside of class hours. The responses were collated under each question category.

### Criteria

The yardstick for success is that the majority of students should report that the workbook instructions were clear and complete as well as being new and interesting.

## **CHAPTER FOUR**

### **RESULTS**

#### **One-to-One Evaluation**

An early draft of the workbook was given to three students of different reading abilities to evaluate. They were asked to apply the workbook instructions to a short passage in order to detect difficulties in the explanations and instructions as well as comment on the adequacy of the examples and feedback. The feedback from the three students was the same except that the lower ability readers had greater difficulty with the vocabulary. For instance, terms such as "comprehension" and "processing information" were "too high level", whereas the word "understanding" was not. A summary of the students' evaluation is given in Appendix C.

The students made four main points about the early draft of the workbook.

- 1) They were highly positive about exercises which required applying reading strategies to a relevant pharmacology article;
- 2) The rationale for strategy use in "Background information" was too difficult to follow because of lengthy and complex sentences. The recommendation was made to write in shorter sentences and use simpler terms;

- 3) The time frames for surveying the reading and reading a "chunk" of text were misleading. For instance, one student thought that it was obligatory to spend three to five minutes reading a single paragraph and
- 4) Feedback on pre-reading and surveying strategies was needed.

As a result of the one-to-one evaluation process, the vocabulary and sentence structure was simplified. The instruction to divide the reading into "chunks" of text was modified and immediately retested with satisfactory results. It was decided, however, not to give written feedback on pre-reading and surveying strategies as these are idiosyncratic. Rather feedback came from the discussion in the introductory class and practise session.

### Expert Review

Subject matter experts were asked to review both the early drafts of the workbook and the completed workbook that was used during the field trial. As previously described in the section on instructional strategy development, the subject matter experts made several suggestions for improvement of the early drafts of the workbook. These suggestions were incorporated into the version of the workbook used for the field trial. The rationale for requesting a SME review of the completed workbook is based on the notion that while a product is being used, the formative evaluation process is ongoing. Also, the SME should be asked

to review the final product to ensure that the content has not been distorted by the revision process (Weston, 1987). Lastly, it was felt that additional SME recommendations might be helpful to further modify the workbook for use after the field trial.

The Learning Specialist at C.E.G.E.P. John Abbott was invited to review the completed workbook on reading strategies. A summary of her responses to the open-ended question is given in Appendix D.

According to the Learning Specialist, positive features were the strategies such as pre-reading, actively reading in "chunks" and summarizing, that helped establish the cognitive framework for new ideas. Other positive features were the metacognitive strategies embedded in the pre-reading and summarizing strategies.

The Learning Specialist was somewhat sceptical about the option to summarize by mapping. It is her experience with John Abbott students, that most express frustration when asked to organize concepts in a structured pattern or map.

The only suggestion for improvement for future use was to include strategies for acquiring new vocabulary given the diverse language background of nursing students and the technical terms used in nursing texts.

## Field Trial

Twenty seven students volunteered to participate in this formative evaluation study, however only sixteen students completed the summary exercises. Eleven students dropped out citing personal or course load commitments as reasons for discontinuing their participation. As participation was optional and ungraded (thereby eliminating an obvious incentive), this dropout rate of approximately 41%, while high, was not entirely unexpected. In a parallel situation, The Learning Centre at John Abbott found that study skills courses had a high attrition rate until students were obliged to pay a registration fee of twenty five dollars which is redeemable upon completion of the course. Only the remaining sixteen students were asked to evaluate the workbook on reading strategies.

As previously described, four instruments were used to assess the effectiveness of the instructional strategy - comparison of pre/post LASSI scores; a questionnaire on reading strategy use; summaries and interviews with selected students.

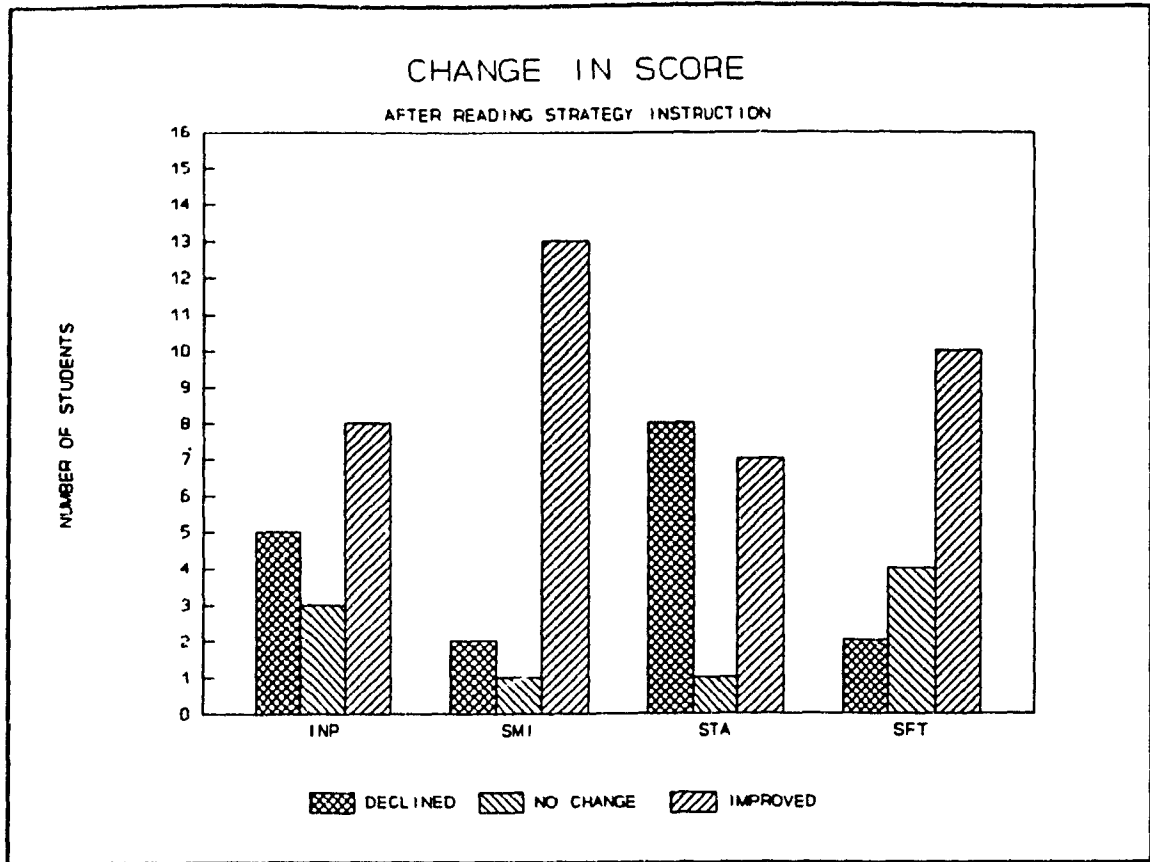
The questionnaire and interviews were also used to determine the degree to which two other evaluation objectives were met. They were: to determine content accuracy and completeness; and to assess the impact of instruction on learners attitudes to use of reading strategies. A separate questionnaire was used to obtain feedback on the technical elements of the workbook.

### A) LASSI Results

A comparison of student pre and post responses to items within four subscales of the LASSI inventory was performed as one of four measures to assess for instructional effectiveness. Due to the small sample size (n=16) and the nature of the information desired, no attempt was made to test the pretest-posttest differences using standard statistical tests. Summary data are presented in bar graphs that indicate the frequency distribution of change in score. Results are interpreted conservatively. Figure 2, page 49, shows the change in scores for INP (information processing); SMI (select main idea); STA (study aids - the use of text structure and study aids); SFT (self testing). These four subscales were deemed most appropriate to the purposes of this evaluation.

It appears on the basis of the LASSI results that instruction in reading strategies was generally more effective in strategies for selecting main ideas and monitoring comprehension than in process/elaborating information or using text structure. To obtain more specific information, an analysis of each subscale was executed.





**Figure 2: Comparison of Students' Pre/Post LASSI Scores**

**SMI results.** As Figure 2 shows, 13 of 16 students had higher scores following instruction, while one student's score remained the same and two students' scores actually declined. Figure 3 (page 50) below displays the pattern of change of response among the three ability groups.

In the high ability group, three of four students perceive themselves as better able to select main ideas while one student's perfect score did not change following instruction. In the medium ability group, six of seven students scores improved while one student score declined. Lastly, in the low ability group, four of

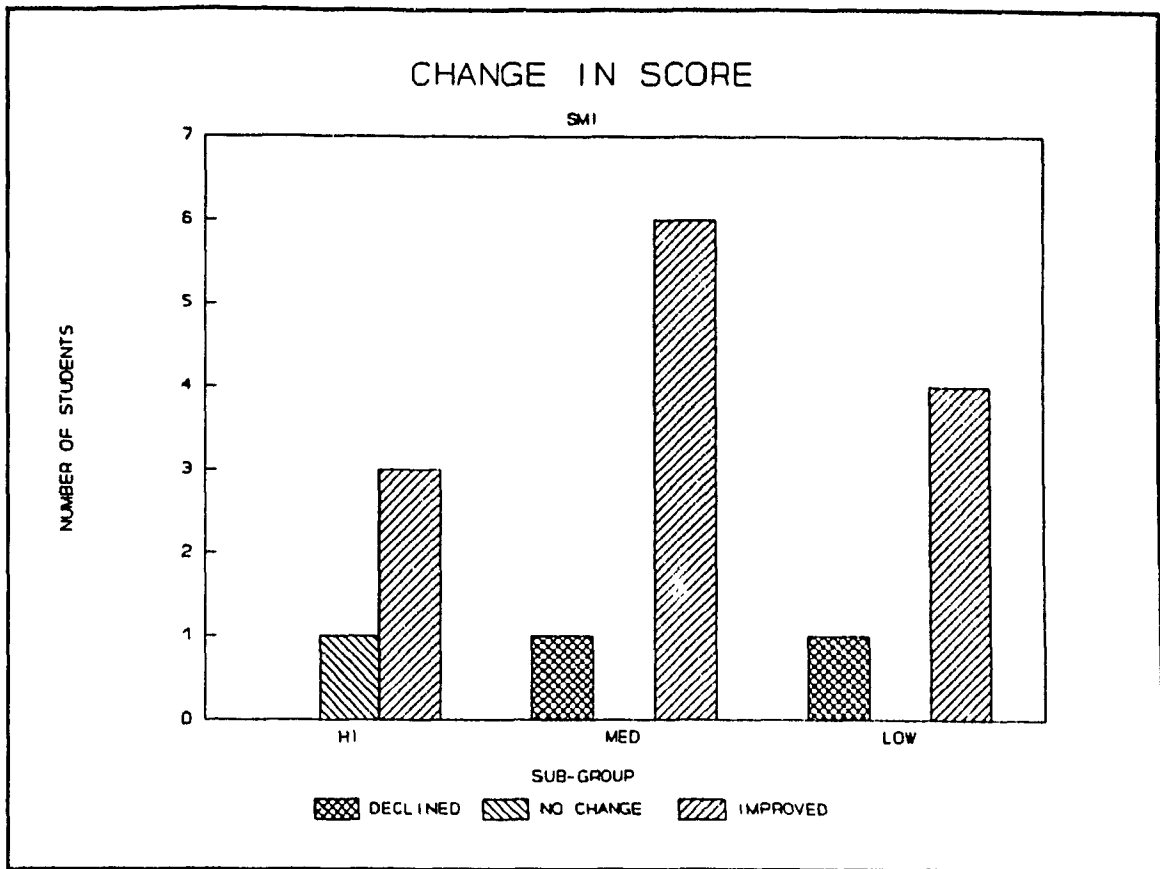


Figure 3: Comparison of Students' Pre/Post SMI Scores Among Three Ability Groups

five student scores improved and one student score declined (it should be noted that this student's score dramatically declined across all subscales). Thus, it would appear that reading strategy instruction may have successfully helped students to select important information. Of course, other variables, such as maturation, may also have contributed to this improvement.

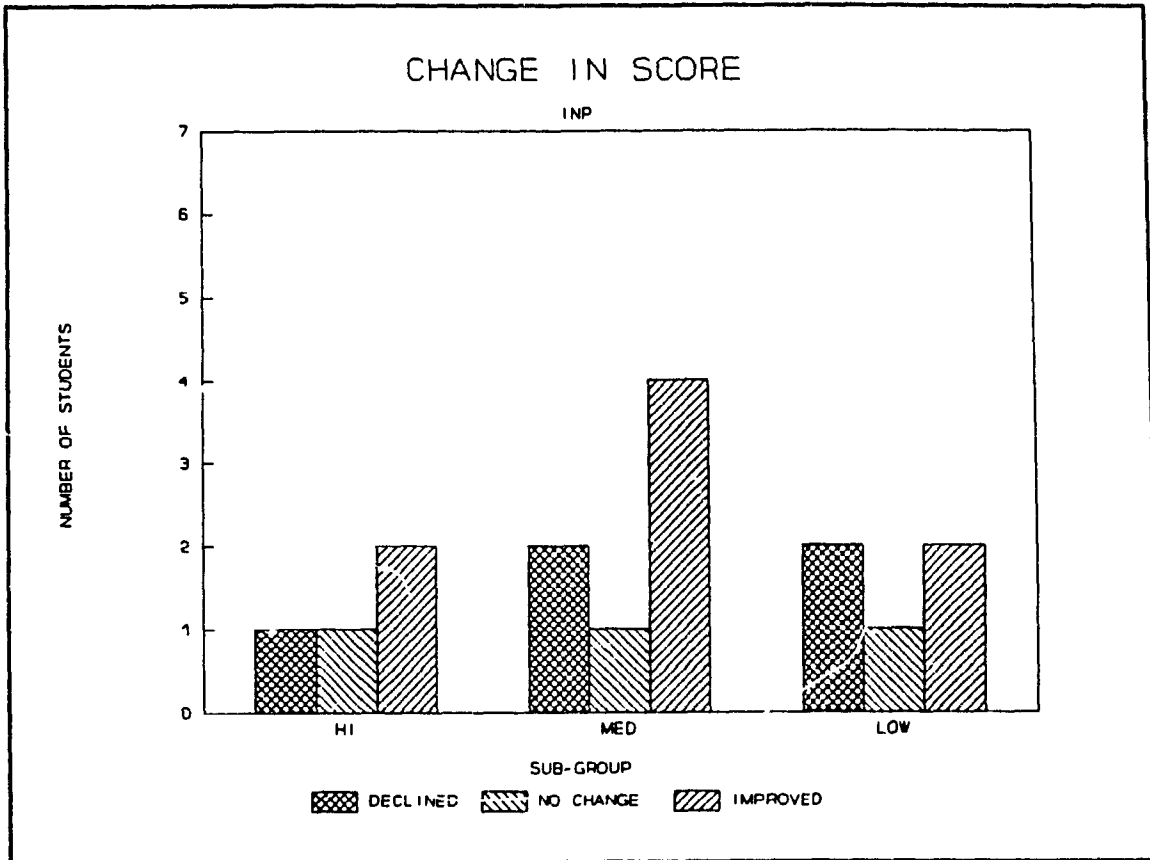
Closer inspection of student responses to individual items within the SMI subscale helps to confirm this initial impression. For instance, comparison of student responses to Item 60, "It is hard for me to decide what is important to

underline in a text", show that prior to instruction, three students agreed with this statement (selecting either "Very much typical of me" or "Fairly typical of me") while four students were neutral (selecting "Somewhat typical of me") and nine students disagreed (selecting "Not very typical of me" or "Very typical of me"). Following instruction, thirteen students disagreed, one student remained neutral and only two agreed with this statement. Of the seven students who originally were neutral or agreed that "It is hard to decide what is important...", five reversed their opinion and disagreed with this statement in the post LASSI inventory, and two did not. Of the nine students who originally felt they could find the important information in a text, only one student (whose scores declined across all subscales) changed her opinion.

Similarly, in response to Item #72, "Often when I am studying I seem to get lost in the details and can't see the forests for the trees", nine students disagreed, three students were neutral and four students agreed with this statement prior to instruction. Three of the low ability group, three of the medium ability group and one of the high ability group were either neutral or agreed with this statement (selecting "Very much typical of me"(1); Fairly typical of me (3) or "Somewhat typical of me" (3)). In contrast, following instruction, fourteen students strongly disagreed with this statement. Of the seven students who originally found it "easy to get lost in the details", six reversed their opinion.

As a result, it may be concluded that instruction in reading strategies may have helped students select important information from texts.

**INP results.** As Figure 2 (page 49) displays, there was an improvement in eight student scores in INP, a decline in five student scores and three student scores showed no change. This mixed response is true for the three ability groups (see Figure 4 below).



**Figure 4: Comparison of Students' Pre/Post INP Scores Among Three Ability Groups**

From this overview of results, it may be concluded that instruction in reading strategies was partially successful in helping one-half of the student sample to process and elaborate information.

Examination of student responses to individual INP items that directly relate to reading comprehension provides some clues as what components of the workbook should be re-examined and possibly revised. For example, pretest response to Item #40 "I try to find relationships between what I am learning and what I already know", showed that nine students agreed (selecting "Very much typical" or "Fairly typical"), four were neutral ("Somewhat typical") and three disagreed ("Not very typical" or "Not at all typical"). In the post test, ten agreed, three were neutral and two disagreed. Comparison of individual student scores shows that seven student scores remained identical, four improved and three declined. Thus it would appear that instruction had very little impact on students activation of existing knowledge.

Similarly, in response to Item 12, "I try to think through a topic and decide what I am supposed to learn...", six students agreed with this statement, four were neutral and six disagreed in the pretest. In the post test, six students agreed, six were neutral and four disagreed. Comparison of individual student responses showed no directional changes for students who were neutral. Students who disagreed, tended to continue to disagree or be neutral. Once again, it would appear that the pre-reading component of the instruction had very little influence.

Likewise, no differences in the distribution of student responses to Item 23, "I translate what I am studying into my own words", were noted in the pre/post scores (eight agreed, six were neutral and two disagreed).

On the other hand, student responses to Item 47, "I try to relate what I am studying to my own experiences", show a modest positive shift in the pre/post distribution. In the pretest, nine students agreed with this statement, six were neutral and three disagreed. In the posttest, eleven students agreed, four were neutral and two disagreed. One half of the students who were neutral initially, changed to strong agreement in the post test. This may indicate that students use of inferencing was positively influenced by the reading strategy.

In conclusion, it would appear that on the basis of the INP results, the strategies for elaborating information presented in the workbook such as activating knowledge, paraphrasing, and using patient examples was more successful as a reinforcement for students who were already using these strategies prior to instruction. Only a minority of students who were not using these strategies prior to instruction (as evidenced by the pre-LASSI scores) were induced to change behaviour. These results, with the exception of the strategy for inferencing, tend to accord with the results of the questionnaire on reading strategy use and interviews.

STA results. Figure 2 (page 49) indicates that there was an improvement in seven students scores, a decline in eight student scores and one student showed no change. Figure 5 (page 55) shows that the high ability and medium ability groups had a similar pattern in change of response (one half of the group showed

improvement, the other half declined). The low ability group show that more students improved than declined.

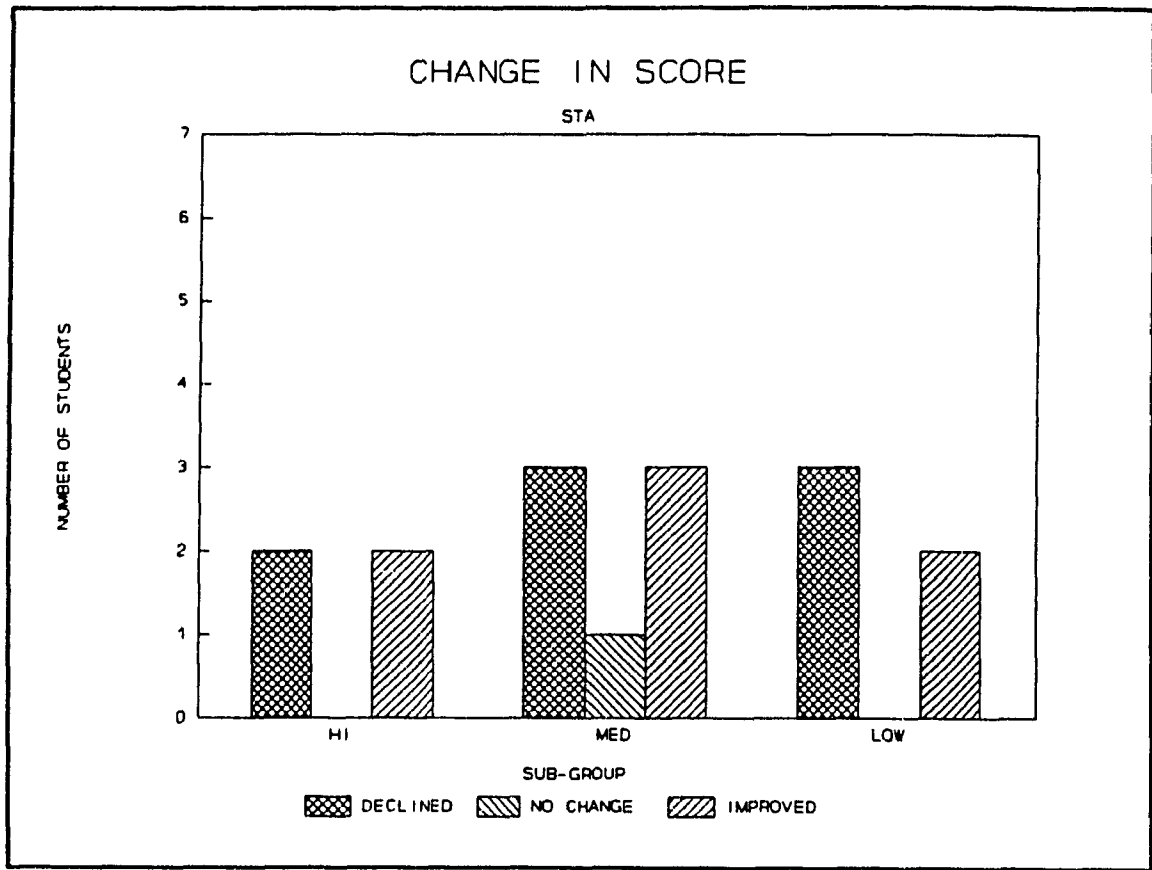


Figure 5: Comparison of Students' Pre/Post STA Scores Among Three Ability Groups

Thus, it would appear that about one-half of the student sample do not use text structure and their own study aids as frequently to foster comprehension following instruction as they did prior to instruction.

Individual STA items were scrutinized to determine which elements of text structure students were using or not using following instruction.

For instance, in response to Item 44, "I key in on the first and/or last sentences of most paragraphs when reading my text", the pretest scores showed that three students agreed, seven were neutral and six disagreed. Post-test scores reveal that eight students now agreed, four remained neutral and four disagreed. Comparison of individual scores showed a positive directional change for nine students. Thus it would seem that instruction in topic sentence position may have had some positive influence.

On the other hand, in response to Item 7, "I use special study helps such as italics and headings that are in my textbook", the pretest scores showed that nine were in agreement, three were neutral and four disagreed. Posttest scores showed that ten students agreed, one student was neutral and five disagreed. Comparison of individual student responses showed that only five students responses shifted positively, eight remained the same and three shifted in a negative direction. From these results, it appears that the instruction to use headings to find the main idea primarily reinforced existing strategies.

Finally, in response to Item 53, "I make sample charts, diagrams or tables to summarize material in my courses", pretest scores show that nine students answered positively, one was neutral and five disagreed. Following instruction, only six students agreed with this statement, five were neutral and five disagreed. Given that students were instructed to summarize readings either in outline format or mapping, it is tempting to speculate that the instruction actually inhibited students'

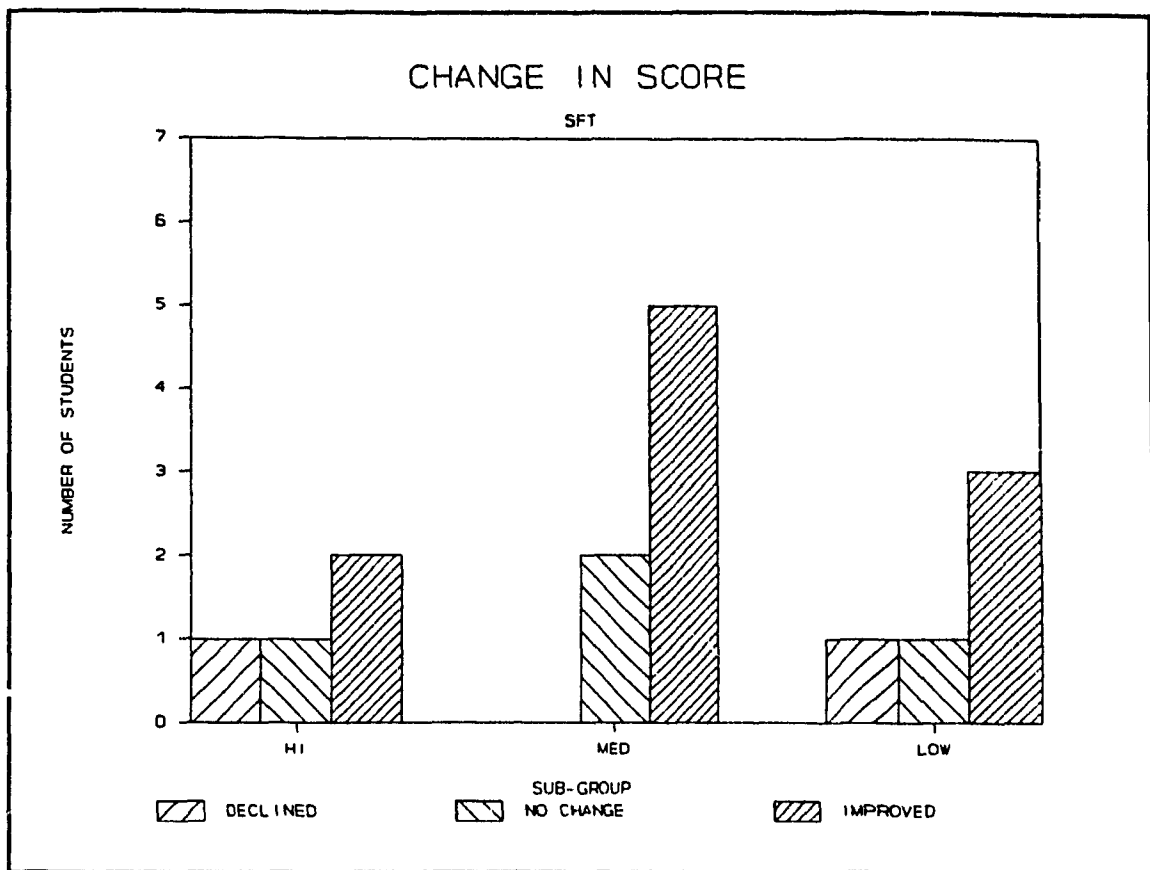


creative ways to summarize while students developed abilities in outlining or mapping.

In conclusion, on the basis of these STA results, it appears that instruction to use text structure, especially the use of topic sentences, was effective for about half the student sample. This result was partially confirmed by the results of the questionnaire on reading strategy use and interviews. These measures indicated that approximately 80-90% of students survey the text but only 75% look for topic sentences (Figure 8, page 107).

SFT results. Figure 2 (page 49) indicates that ten of sixteen students showed an improvement while four student scores remained the same and two student scores declined. Figure 6 (page 58) reveals that this improvement was true for all three ability groups. The greatest positive change occurred in the middle level group.

Inspection of items within the SFT subscale that relate directly to reading showed that instruction may have contributed to student use of metacognitive strategies. For instance, in response to Item 30, "I stop periodically while reading and mentally go over or review what was said", pretest scores show that seven students agreed, five were neutral and four disagreed. On the posttest, twelve students agreed, three were neutral and one disagreed with the statement in Item 30. Therefore, one may conclude that the strategy for chunking text and mentally reviewing main ideas may have been successful.



**Figure 6: Comparison of Students' Pre/Post SFT Scores  
Among Three Ability Groups**

Comparison of student pretest/post-test responses to Item 65, "I test myself to be sure I know the material I have been studying", revealed a weak positive change. Pretest scores show that six students agreed, eight were neutral and two disagreed with the statement. Posttest scores showed that eight students agreed, six were neutral and two disagreed. This may indicate that the strategy to use summaries as a means to monitor comprehension may require revision.

## **B) Reading Strategy Preferences and Attitudes**

Reading strategy preferences. Section one (close-ended response section) of the questionnaire on reading strategy preferences and attitudes was another instrument used to measure the effectiveness of the instruction on reading strategies (see Appendix E). This section asked students to identify those strategies that were seen as "Helpful" or "very helpful". It was reasoned that for instruction to be successful, students must report frequent use of the strategies and that they foster and/or monitor comprehension. It was further reasoned that if less than 75% of the student sample did not find the strategy "Helpful" or "Very Helpful", then that component of the workbook instruction should be re-examined and possibly revised.

The results of the close-ended portion of the questionnaire show that six of eleven strategies were seen as "Helpful" or "Very Helpful" by at least 75% of the student sample (see Figure 8, page 107). They included a) reading the text in chunks (97% or n=15), b) summarizing (94%), c) relating new information to patient examples (94%) d) surveying the text (87% or n=14), e) using lookbacks (81%), f) looking for topic sentences (75% or n=12), and g) underlining only after the main idea in a chunk of text was found (75%).

Three strategies were far from meeting the 75% criteria These were:

- 1) activating existing knowledge to guide learning (Item 1: "Asking yourself what you already know about the topic to be read").

Approximately 69% students found this to be "Useful" or "Very

Useful", while 31% found it "Rarely helpful" or "Not Helpful".

Interestingly, this result corresponds with the item analysis of the LASSI INP #40 where only 10 of 16 (approximately 62%) agreed with the statement "I try to find relationships between what I am learning and what I already know".

- 2) identification of main ideas by self-questioning (Item 5: "Turning headers into questions to find main ideas"). Approximately 50% (n=8) of the students sampled did not find this strategy useful. Again, this response corresponds to the item analysis of the LASSI STA #7 where only 10 students agreed with the statement "I use special study helps such as italics and headings, that are in my textbook".
- 3) Monitoring comprehension by making predictions (Item 2: "Making predictions about the topic to be read"). Fifty-six percent of the students reported that this was either "Rarely helpful" or "Not helpful". Similarly, 75% of students found that they did not use lookbacks (text reinspection) when the text did not match predictions (Item 9).

Comparison of strategy use among the three ability groups showed that the pattern of response to each item was similar. Thus, no differences in strategy preferences according to ability emerged.

In summary, it appears that instruction for strategies that require deep cognitive processing such as making predictions and activating existing knowledge require revision. It may be that these are difficult strategies for the student who is a novice (in content and strategy knowledge) to use because links in a domain specific knowledge base are not well established and therefore, in future, the instructional strategy will need to include more provisions for support.

Attitudinal Response. The responses to the open-ended questions of the questionnaire provided some indication of the attitudinal response to instruction on reading strategies.

When asked to give an overall opinion of reading strategies, 15 of 16 students wrote that they were helpful for a variety of reasons: a) increased understanding (n=8); select important ideas (3); supplement existing strategies (1); reinforced existing strategies. Additional positive comments included: reading strategies took time and motivation but it was worth it (2); reinforced memory (1) and helped to organize what was read (1). There was one negative comment that the strategies, while useful, were too time consuming.

When asked if instruction stimulated analysis and change in strategy use, twelve answered affirmatively, citing examples such as being more selective in underlining (5); summarizing more frequently (3), reading in chunks (2) and using pre-reading strategies (2). Four students stated that instruction made them more aware and reinforced their own strategies.

Finally, when asked if reading strategies were used with other texts, fifteen students agreed (although four students qualified agreement to "when they had time" or "just with nursing texts"). One student did not answer the question. Thus, it may be concluded the majority of students had a positive response to the instruction.

A number of recommendations were given for future teaching of reading strategies. The most frequent recommendation was to teach reading strategies in first year of nursing. As one student wrote:

It might be helpful if it was taught in earlier semesters when the readings were not as intense. This way, the strategies would already be there for when the readings get harder. You wouldn't have to concentrate on the reading and learning the strategy at the same time.

Other recommendations included are: a) teach speed reading (1), c) use more examples (1), d) mention the Learning Centre as a resource (1), and e) have group discussion periodically, to discuss problems and what strategies are useful (1).

### C) Interviews

The purpose of the interviews with nine students of different reading abilities was to collect and analyze qualitative data related to the evaluation objectives.

Following transcription of the nine interviews, the responses to the major themes or questions were independently identified and categorized by two people (the researcher and a doctoral student in the Programme in Educational

Technology) using the interview agenda as a guide. There was a 93% agreement on the categorization of the 218 responses (statements made by the interviewees). Where a discrepancy existed, the researcher re-examined the transcripts and made the final decision. A summary of interview responses was tabulated (see Appendix F, Figure 9, page 113).

Impact of Instruction on learners attitudes. The interviews revealed that all interviewees had a positive opinion about the use of reading strategies - for example "It helps me focus on important parts"; "Helps me monitor my understanding"; "Helps me remember and learn better" (section one of the interview summary).

Instructional effectiveness. As section two and three of the interview summary shows, more reading strategies were used following instructions by seven of nine students (the medium and low ability readers). The most frequently used reading strategies following instruction were: surveying the text (n=8); reading in "chunks" (n=6); looking for topic sentences (n=8); turning headers into question (n=5) and summarizing (writing outlines or mapping) (n=7). Less commonly used strategies were activating prior knowledge (five students) and making predictions (four students).

The two high ability students reported no change in strategy use, however, they independently activated prior knowledge, used self-questioning and summarized prior to instruction.

When asked what strategies were used when reading difficult texts, in addition to the strategies listed above, the following strategies were elicited: more self-questioning (n=4); more lookback/lookforwards (5); use of other texts and dictionaries for explanation (5); review past knowledge (4) and ask teacher/others (2) (section four of interview summary). Interestingly, the use of other texts was not described in the workbook. In addition, instruction in reading strategies appears to have encouraged students to examine how they learn from text and to exert more conscious control over reading (section five). Comments such as "It never occurred to me before that my knowledge was essential to reading"; "I was reading too fast before, now I question more" and "Persistence is part of the process" shows an increased level of awareness of strategies that do or do not work for the individual.

The conclusion that can be drawn from the interviews is that in terms of instructional effectiveness, the workbook was successful in introducing more strategies to foster and monitor comprehension. Once again, there is evidence to suggest that the pre-reading strategy of activating prior knowledge seems to require some revision since only four students referred to it in connection to reading difficult text. Additionally, the workbook has not convinced students of the value of making predictions either to enhance metacognitive awareness or to link new knowledge to existing knowledge. Lastly, instruction in how to use other texts, such as dictionaries to help with comprehension should be explored.



Content Accuracy and completeness. Section six of the interview summary provides a list of comments/recommendation for change in the workbook.

The interviews with the two high ability readers revealed that instructions in the workbook on reading strategies were similar to the strategies they used prior to participation in this study. This may be viewed as partial confirmation that the choice of strategies was appropriate.

Three recommendations, however, were made to modify the workbook. First, sequencing of strategies, as presented in the workbook, should be modified to allow for a flexible use, depending on the difficulty of the text. This is in line with Garner's notion that expert readers use strategies conditionally.

Second, instructions in writing summaries should be revised - students need more encouragement to delete detail information on review of the summary.

Third, remove time frames for surveying and actively reading since these may be perceived as intimidating to some readers.

Interviews with the seven medium and low ability readers showed a preference for applying the strategies to relevant readings (four students) and feedback on summaries was beneficial (four students). Like the high ability readers, sequencing of strategies was not considered necessary (six students).

Lastly, four students believe it is important to keep the introductory class where the strategies were first practised in order to motivate and provide additional examples and feedback. From these comments, it can be suggested that

the workbook by itself would not be sufficient, in its present form, to encourage students to develop new reading strategies.

#### D) Evaluation of Summaries

The feedback to sixty-eight summaries (sixteen students x four summaries) was used to evaluate the extent to which students were selecting and organizing main ideas from the assigned readings.

When the summaries were evaluated at the sentence level for selection of main ideas, it was found that all students, regardless of reading ability, selected most to all of the main ideas in each article. When related (secondary) ideas were included in the summaries, all students subsumed the related ideas under the main ideas.

As the summaries were "writer-based" (as opposed to "teacher-based"), some students summaries posed a challenge in evaluating for the selection of main ideas. For instance, one student consistently wrote only key words rather than phrases in her outline, so it was impossible to determine if she completely comprehended the main idea.

At the "whole text" level of evaluation, it was noted that fourteen of the sixteen students chose outlining as the primary method to summarize. The remaining two students mapped information. Almost all summaries tended to follow the linear sequence of the original text. Three students, presented ideas in a somewhat novel order by combining propositions or creating charts. The length of

the summaries appeared to vary among reading ability groups. The high and medium ability groups tended to be somewhat shorter (one to three pages) than the low ability groups (one to four pages) but as presentation format varied, it was difficult to infer much from this observation other than longer summaries tended to include more detailed information. Overall, the evaluation of the summaries indicated an ability on the part of the students to select and organize main ideas after reading.

#### E) Feedback on technical elements

Thirteen of sixteen students completed this open-ended questionnaire. The majority of responses were simple yes or no answers without elaboration, so it was difficult to get specific information for improvement (see Appendix G). Poor timing partly accounts for the paucity of responses - this questionnaire was distributed during the last weeks of the semester when course evaluations as well the LASSI and reading preference questionnaire were completed.

Nevertheless, all students reported finding the instructions in the workbook clear for all strategies except for the strategy for monitoring comprehension (one student) and the strategy for drawing inferences (using examples from nursing) (two students). All students reported that the vocabulary and examples were appropriate. All students, except one, found the feedback to be adequate.

The majority of students (11 of 13) found the instruction to be new or interesting; one found it not new but interesting and one found it somewhat

interesting. Thus, it would appear that students were generally satisfied with the workbook's technical elements.

## **CHAPTER FIVE**

### **DISCUSSION**

Reading, especially of expository text, is hard work. It is, however, a necessary skill for students in a professional programme such as nursing. Just as importantly, it continues to be necessary for practising nursing graduates in order for them to keep abreast of new information. Yet it is also known that many C.E.G.E.P. level nursing students for a variety of reasons have difficulty comprehending text. Thus, it seemed appropriate to teach reading strategies in order to make students more skilled readers.

The results of the literature search and discussion with subject matter experts suggested that skilled readers have an arsenal of strategies for selecting main ideas, summarizing, monitoring comprehension and drawing inferences which are used to construct meaning from the text. Moreover, skilled readers use these strategies flexibly and adaptively as text conditions warrant. Skilled readers also reflect on what they are doing while they are reading (Baker & Brown, 1984). Less skilled readers, on the other hand, have fewer strategies to use in the struggle to forge meaning and tend to be less aware of comprehension deficits. The literature review also suggested that reading strategies can be effectively learned if the strategies were taught explicitly and opportunities to practise were given.

The instructional strategy of using a workbook to teach reading strategies explicitly, combined with four practise summaries with feedback, appears to have

been generally successful in helping students select and organize main ideas (on the basis of the results of the three self-report measures and the quality of summaries submitted). Furthermore, the overall impression gained from the open-ended questionnaire and interviews is that use of reading strategies has improved comprehension and fostered comprehension monitoring. However, as the evaluation design did not include comparison of the student sample with a control group on an achievement test performance (for example, multiple choice exams on pharmacology), this impression can not be validated.

To better understand the strengths and weaknesses of the instructional strategy, it is important to look at how students responded to specific strategy instruction (through self reports of what the instruction stimulated them to do) and to discover where possible what sense they rendered of what they were taught (Shulman, in Dole, Duffy, Roehler & Pearson, 1991).

In terms of finding the main ideas, more than three-quarters of the student sample reported (in the questionnaire on reading strategy use and in interviews) that they used strategies for surveying the text, searching for topic sentences and "chunking" reading. These results tended to be confirmed by the LASSI results although the percentages were somewhat lower. This indicates that instruction for these elements was effective. Considering that strategies for chunking text and finding the topic sentence are fairly concrete and almost "Formula driven", it is not surprising to find that students easily adopt them. One wonders, however, if the adoption of easy to use strategies may lead to the exclusion of other more

"difficult" (i.e., requiring greater effort), but potentially more beneficial strategies for finding the main ideas.

Strategies for activating prior knowledge may be examples of "difficult" reading strategies. Only two-thirds of the student sample reported, in the questionnaire on strategy use, using the workbook strategies for activating knowledge. On the basis of analysis of the LASSI results and interviews, it appears that half of these students were already accessing prior knowledge to make sense of the text before instruction. In other words, the instruction, in its present form, probably had very little effect on students' choice of strategies to link new knowledge with old. This may be indicative of a serious shortcoming of the workbook's instructions since the only way to decrease the arbitrariness of information is to link new information to learners knowledge and experience. It must also be recognized, however, that constructing meaningful links is difficult for the novice learner since the relations are based on domain specific knowledge not readily available to the learner (Divesta & Finke, 1985).

Further investigation is needed to determine the possible reasons why students did not adopt the strategies, as outlined in the workbook, for activating prior knowledge. For example, it is interesting to note that almost all students reported that they used inferencing (by thinking of patient examples) to make sense of the text. Does this mean that students tend to access knowledge best by thinking of examples? If so, it would be a fairly easy task to modify the workbook instructions for activating knowledge to include thinking about examples from

biology or nursing classes that relate to the assigned reading. Additional methods of providing support to help students adopt these "difficult" strategies should be also be explored. In the present instructional design, support was offered in the form of a workbook to which students could refer as necessary and through written feedback; it may be that opportunities for peer modelling could provide the extra scaffolding needed to integrate difficult strategies into known routines.

In terms of summarizing information, it would appear that instruction to outline or map main ideas and important related ideas was successful. More than 90% of students reported using summarizing when reading texts and the summaries that were submitted were largely accurate representations of the main ideas of the selected texts. Since summarizing can be viewed as a type of elaboration activity (Weinstein & Mayer, 1986), it can be concluded that instruction in summarizing likely helped students make sense of new information.

In terms of strategies for monitoring comprehension, it must be remembered that comprehension monitoring is a two-part process - being aware of how much is understood and knowing what to do if comprehension failures occur (Dole, Duffy, Roehler & Pearson, 1991). The responses from the open-ended questionnaire on reading strategy use and the interviews suggested that students responded to instruction by becoming more aware and gaining greater control of more strategies to repair comprehension deficits. One of the findings of the LASSI inventory was that, following instruction, more students reported



stopping to review periodically while reading. Similarly, in the questionnaire on reading strategy use, three quarters of the students reported delaying underlining in a chunk of text until they were sure of the main ideas. Selective text reinspection or "Lookback" strategies were also used by more than 80% of the students.

On the other hand, the strategy of matching predictions with the meaning of the text to check for discrepancy was not adopted by students. Further study is needed to discover if the students could not make sense of the instructions or whether students have a perception that they lack sufficient knowledge to implement this strategy. At present, students are instructed to make predictions as part of the pre-reading strategy and prior to surveying the text. It may be recalled that almost all students reported using the reading strategies in a different order than that of the workbook; it may be that simply re-arranging the sequencing of strategies would encourage greater use of this particular strategy. For example, if the workbook was revised so that strategies for surveying the text preceded strategies for making predictions, would students be more likely to make predictions? Additional field trials may provide the answer.

Lastly, the designer chose to omit instruction on strategies for understanding new vocabulary from the workbook. It was reasoned, at the time of the development of the workbook, that introducing a strategy for developing new vocabulary might be overly time consuming and deflect students from the central purpose of selecting and organizing main ideas from text. The interviews with less

skilled readers, however, suggests that new vocabulary is a prime indicator of possible comprehension failure and that these students had to develop their own "fix it" strategies by using other texts and the teacher to remedy problems in comprehension. Therefore, for future teaching of reading strategies, it would be important to explore strategies that help students learn vocabulary efficiently.

### Recommendations for Future Development

A cognitively based view of reading comprehension leads to the conviction that the knowledge a reader brings to the text is paramount (Dole, Duffy, Roehler and Pearson). Therefore, it is imperative that students learn how to activate knowledge - domain specific knowledge, general knowledge and reading strategy knowledge. More research is needed to discover the methods used by student nurses to activate knowledge in order to develop instruction that builds on or relates to the students' existing framework of strategies for text comprehension. It would be helpful to develop a reading strategy inventory similar in nature to the LASSi as an assessment tool to achieve this goal.

Secondly, it seems more appropriate to teach reading strategies in the first year of the nursing programme in order to better prepare them for the reading requirements of later semesters.

In conclusion, as students reach college level studies with inadequately developed reading abilities, there is an increasing need for further research into

**the instructional design of educational materials that will assist the student to read effectively and efficiently.**

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**Appendix A**  
**Questionnaire on**  
**Learning Methods and Abilities**  
**When Studying Pharmacology**  
**With Responses**

**SECTION I : LEARNING METHODS/ABILITIES**

The statements in this section are designed to gather information about learning methods/abilities when studying pharmacology. Please read each statement and then mark a response that best reflects your perception of YOUR OWN learning methods/abilities.

- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know

1. I use the pharmacology text to prepare for clinical/class assignments.
2. I study the introductory section in the pharmacology chapter to gain a general understanding of a classification of drugs.
3. I tend to take a lot of detailed notes when studying pharmacology.
4. I am able to explain the most important ideas of a classification of drugs.
5. I have trouble figuring out just what to do to learn pharmacology.
6. I am able to distinguish between more important and less important information when I read the pharmacology text.
7. I use my general knowledge of a classification of drugs to guide my learning of specific drugs.

8. I tend to concentrate my efforts on memorizing details about specific drugs.
9. I am able to anticipate the action of a newly prescribed drug on the basis of my knowledge of its classification.
10. I am able to state the common features of drugs within the same classification.
11. I try to describe in my own words the new terms used in the pharmacology text.
12. I tend to get lost in the details when studying pharmacology.

## SECTION II : STUDENT SUMMARY

13. What is your mother tongue?
- A. English
  - B. French
  - C. other (please indicate)
14. What is your highest educational qualification?
- A. high school and two years of nursing
  - B. a D.E.C.
  - C. a baccalaureate university degree
  - D. other (please indicate)

## FACULTY QUESTIONNAIRE

### DIRECTIONS:

The following statements describe student perceptions of their own study habits when learning pharmacology. Please read each statement carefully and decide if the statement reflects your overall perception of your students' learning of pharmacology content. Then select one of the following responses.

- a) strongly agree
- b) agree
- c) disagree
- d) strongly disagree
- e) don't know

Circle the letter that corresponds to your assessment.

After completing your own assessment of the course, return to question one. This time predict and record what percentage of the students in your clinical group would answer:

- A or B) strongly agree or agree
- C or D) disagree or strongly disagree
- E) don't know.

To summarize, you will write two responses to each question:

- First: your own opinion
- Second: your prediction of your clinical groups' opinion

1. I use the pharmacology text to prepare for clinical/class assignments.

Own Assessment	Predicted Student Response %
A	A or B _____
B	
C	C or D _____
D	
E	E _____

2. I study the introductory section in the chapter to gain a general understanding of a classification of drugs.
- | Own Assessment | Predicted Student Response % |
|----------------|------------------------------|
| A              | A or B _____                 |
| B              |                              |
| C              | C or D _____                 |
| D              |                              |
| E              | E _____                      |
3. I tend to take a lot of detailed notes when studying pharmacology.
- | Own Assessment | Predicted Student Response % |
|----------------|------------------------------|
| A              | A or B _____                 |
| B              |                              |
| C              | C or D _____                 |
| D              |                              |
| E              | E _____                      |
4. I am able to explain the most important ideas of a classification of drugs.
- | Own Assessment | Predicted Student Response % |
|----------------|------------------------------|
| A              | A or B _____                 |
| B              |                              |
| C              | C or D _____                 |
| D              |                              |
| E              | E _____                      |
5. I have trouble figuring out just what to do to learn pharmacology.
- | Own Assessment | Predicted Student Response % |
|----------------|------------------------------|
| A              | A or B _____                 |
| B              |                              |
| C              | C or D _____                 |
| D              |                              |
| E              | E _____                      |
6. I am able to distinguish between more important and less important information when I read the pharmacology text.
- | Own Assessment | Predicted Student Response % |
|----------------|------------------------------|
| A              | A or B _____                 |
| B              |                              |
| C              | C or D _____                 |
| D              |                              |
| E              | E _____                      |

7. I use my general knowledge of a classification of drugs to guide my learning of specific drugs.

Own Assessment	Predicted Student Response %
A	A or B _____
B	
C	C or D _____
D	
E	E _____

8. I tend to concentrate my efforts on memorizing details about specific drugs.

Own Assessment	Predicted Student Response %
A	A or B _____
B	
C	C or D _____
D	
E	E _____

9. I am able to anticipate the action of a newly prescribed drug on the basis of my knowledge of its classification.

Own Assessment	Predicted Student Response %
A	A or B _____
B	
C	C or D _____
D	
E	E _____

10. I am able to state the common features of drugs within the same classification.

Own Assessment	Predicted Student Response %
A	A or B _____
B	
C	C or D _____
D	
E	E _____

11. I try to describe in my own words the new terms used in the pharmacology text.

Own Assessment

Predicted Student Response %

A

A or B \_\_\_\_\_

B

C

C or D \_\_\_\_\_

D

E

E \_\_\_\_\_

12. I tend to get lost in the details when studying pharmacology.

Own Assessment

Predicted Student Response %

A

A or B \_\_\_\_\_

B

C

C or D \_\_\_\_\_

D

E

E \_\_\_\_\_



## Computerized Assessment of Teaching Systems

### Student Response Analysis

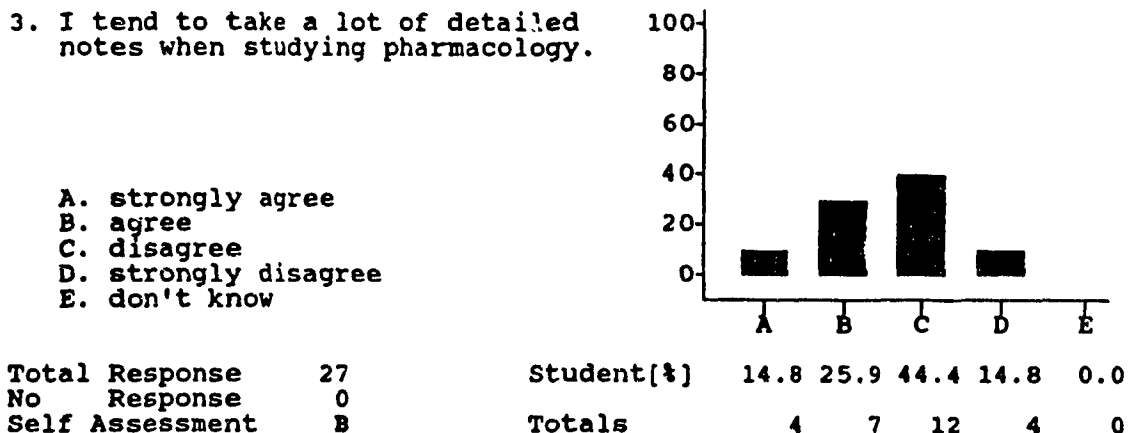
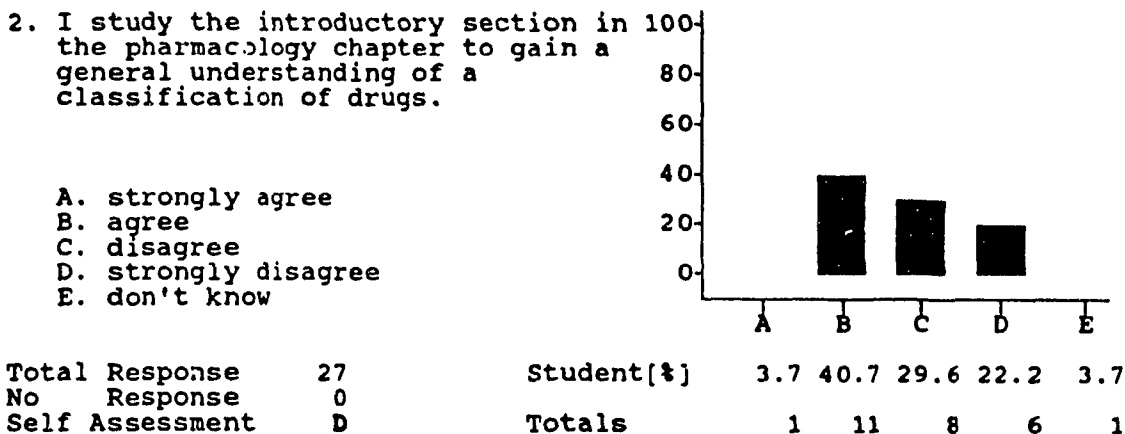
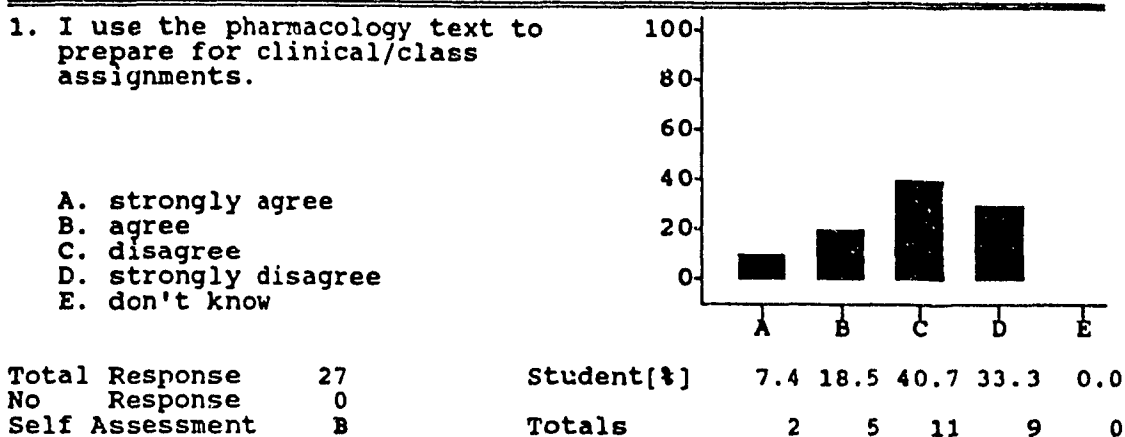


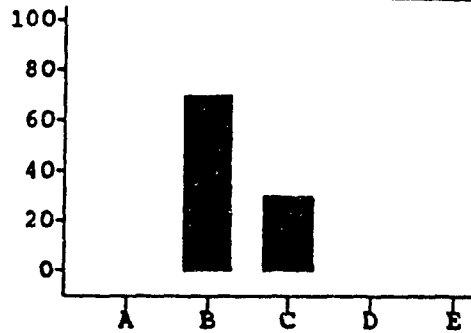
Figure 7: Summary of Student Responses to Learning Pharmacology

Computerized Assessment of Teaching Systems

Student Response Analysis

4. I am able to explain the most important ideas of a classification of drugs.

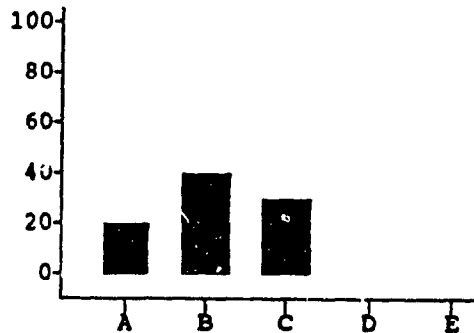
- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



Total Response	27	Student(%)	3.7	66.7	25.9	0.0	3.7
No Response	0	Totals	1	18	7	0	1
Self Assessment	C						

5. I have trouble figuring out just what to do to learn pharmacology.

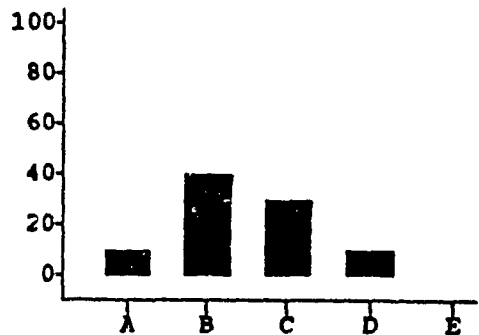
- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



Total Response	27	Student(%)	22.2	40.7	33.3	3.7	0.0
No Response	0	Totals	6	11	9	1	0
Self Assessment	B						

6. I am able to distinguish between more important and less important information when I read the pharmacology text.

- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



Total Response	27	Student(%)	11.1	44.4	29.6	11.1	3.7
No Response	0	Totals	3	12	8	3	1
Self Assessment	D						

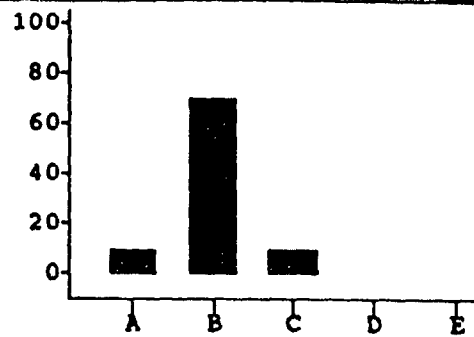
Computerized Assessment of Teaching Systems

420\_BB.STU

Student Response Analysis

7. I use my general knowledge of a classification of drugs to guide my learning of specific drugs.

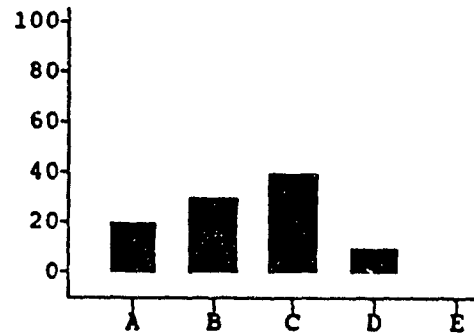
- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



Total Response	27	Student[%]	14.8	66.7	14.8	3.7	0.0
No Response	0						
Self Assessment	D	Totals	4	18	4	1	0

8. I tend to concentrate my efforts on memorizing details about specific drugs.

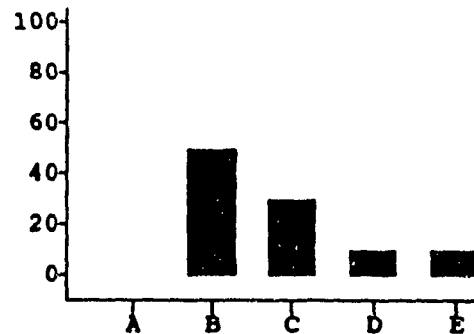
- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



Total Response	27	Student[%]	18.5	33.3	40.7	7.4	0.0
No Response	0						
Self Assessment	B	Totals	5	9	11	2	0

9. I am able to anticipate the action of a newly prescribed drug on the basis of my knowledge of its classification.

- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



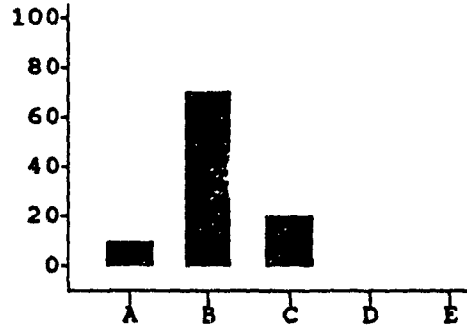
Total Response	27	Student[%]	3.7	51.9	25.9	7.4	11.1
No Response	0						
Self Assessment	C	Totals	1	14	7	2	3

**Computerized Assessment of Teaching Systems**

**Student Response Analysis**

10. I am able to state the common features of drugs within the same classification.

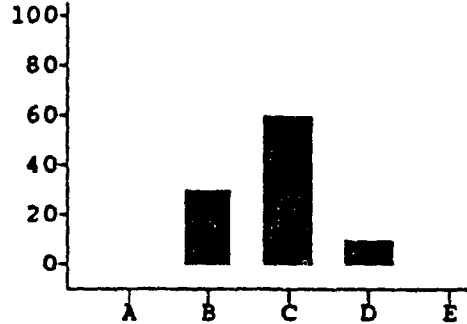
- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



Total Response	27	Student(%)	7.4	70.4	18.5	3.7	0.0
No Response	0	Totals	2	19	5	1	0
Self Assessment	C						

11. I try to describe in my own words the new terms used in the pharmacology text.

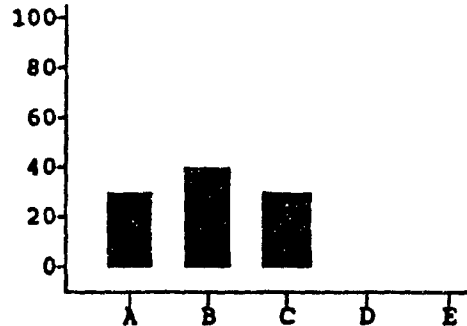
- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



Total Response	27	Student(%)	3.7	33.3	55.6	7.4	0.0
No Response	0	Totals	1	9	15	2	0
Self Assessment	B						

12. I tend to get lost in the details when studying pharmacology.

- A. strongly agree
- B. agree
- C. disagree
- D. strongly disagree
- E. don't know



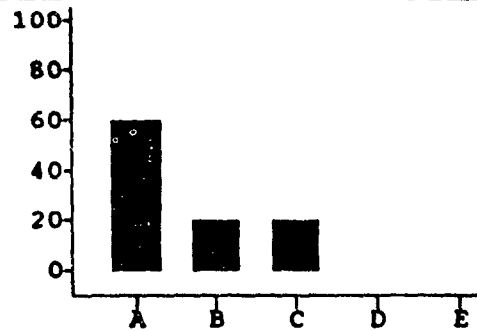
Total Response	27	Student(%)	29.6	40.7	25.9	3.7	0.0
No Response	0	Totals	8	11	7	1	0
Self Assessment	B						

Computerized Assessment of Teaching Systems

Student Response Analysis

13. What is your mother tongue?

- A. English
- B. French
- C. other

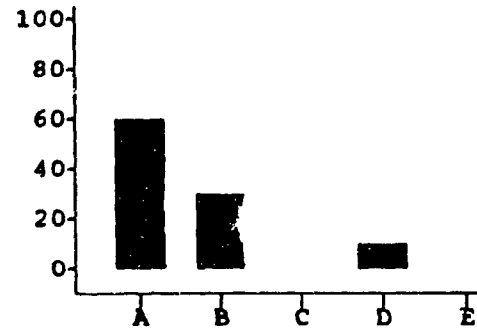


Total Response 27  
No Response 0

Student (%)	A	B	C	D	E
Totals	17	5	5	0	0

14. What is your highest educational qualification?

- A. high school and two years of ...
- B. a D.E.C.
- C. a baccalaureate university ...
- D. other



Total Response 27  
No Response 0

Student (%)	A	B	C	D	E
Totals	16	8	1	2	0

**Appendix B**  
**Summary Feedback Guide**

## SUMMARY FEEDBACK GUIDE

Title of article:

Student:

### 1. Main ideas:

How many identified?

Any missing main ideas?

### 2. Related ideas

How many identified?

### 3. Presentation:

Format for relating main ideas

outline

mapping

other

Are related ideas subsumed  
under main ideas?

Are main ideas highly visible?

Length?

Appendix C  
One-to-One Evaluation  
Guideline and Responses



## FORMATIVE EVALUATION BY STUDENTS:<sup>1</sup>

A new learning guide for reading strategies to be used in conjunction with pharmacology is in the formative stage of development and I would like your feedback on how it may be improved.

As you work through the learning guide please do the following:

1. Circle any words or phrase you did not understand.
2. Place an \* at any spot where you encountered any difficulty e.g. where explanations or examples are unclear.

Write any comments you wish on the learning guide so that we can discuss them after you have finished.

3. Was the instruction in reading strategies clear?

a) pre-reading

*Vocabulary too difficult - didn't understand "processing information" or "comprehension"; terms like "Making sense of the text" easier to understand. Reference made to nursing and biology classes helpful.*

*Need to clarify length of time spent on surveying. suggest underlining key words. sentences are too long - use shorter sentences; space out instructions in point form.*

c) reading actively to find the main idea

---

<sup>1</sup> Student responses are shown in italics.

*Difficult to understand what a "Chunk" is change timing - thought I had to spend 5 minutes on each paragraph.*

d) summarizing

*Instructions on summarizing difficult to follow - how about putting the example before the instructions.*

e) using the summary to monitor comprehension

*Clear*

f) drawing inferences

*Clear, learns best by thinking about clinical experience.*

4. Did the workbook provide adequate examples? Did the examples help clarify the instruction?

*Need a example of a paragraph without a topic sentence.*

5. Was the feedback information clear? Did it reinforce learning?

*Would like feedback on surveying the reading and pre-reading. Rewrite feedback on finding the topic sentence.*

6. Was the vocabulary appropriate (i.e. at your level of understanding?)

*Too high level - "infer", "comprehension" "processing information" difficult.*

7. Was the instruction new or interesting?

*Yes - never had formal instruction in finding main ideas.*

8. Are these reading strategies something you would use when studying pharmacology? **Yes.**

**Appendix D**  
**SME Evaluation**  
**Guideline and Responses**

## Formative Evaluation by Subject Matter Specialist<sup>2</sup>:

### A. Are the strategies for effective reading appropriate and complete?

- 1.) pre-reading strategy of activating prior knowledge?

*Yes, the pre-reading strategy of using existing knowledge as the basis for deriving meaning from the text is appropriate for the material and the student clientele.*

- 2.) surveying the reading?

*The survey strategy described is an effective means to establish an advance organizer or cognitive structure which will identify the relationship among the main ideas in the reading.*

- 3.) reading actively to find the main idea in paragraphs or chunks?

*I like the idea of "chunking" the reading into 3 to 5 minute segments which are read to answer questions. This is very effective with readings of this nature which are very dense with information.*

- 4) summarizing?

- 1) creating an outline

*The outlining strategies are excellent and should prove effective in pharmacology readings where main topics may almost be predictable and repetitive from reading to reading.*

---

<sup>2</sup> Subject matter specialist responses are shown in italics

2) structured pattern

*Mapping is an excellent way to summarize and I will be interested to see how many students elect to use it as a permanent strategy. My experience has been that many students express frustration when asked to organize cognitively in a structured pattern or map.*

5) using the summary to monitor comprehension

*Good follow-up to summarizing*

6) drawing inferences (making connections to nursing practise)

*Students need to use these suggestions! The use of examples and mental examples is a very important strategy when reading to apply knowledge.*

B. Is the flow of the content consistent and logical?

*Yes, it takes the student through the complete process of reading from the first glimpse of the topic through full understanding of the main ideas and their relationships to application of the information.*

C. Is the vocabulary appropriate?

*Yes. It is appropriate to the topic and to the anticipated reading vocabulary of the users.*

D. Do the examples used facilitate understanding of the strategies?

*Yes. The examples are clear and are taken from material that is familiar to the students.*

E. Are the metacognitive strategies appropriate and complete?

*The thinking strategies appear appropriate and complete. The strategies described, particularly the pre-reading and summarizing strategies should assist the student to develop a cognitive framework to link new information with knowledge she already possessed.*

6. Presentation:

Is the material reader friendly?

*The material is very "Reader friendly". It is clearly presented and then concludes with a summary.*

*My only suggestion is to include some strategies for acquiring new vocabulary as this would have a positive impact on comprehension for some students.*

**Appendix E**  
**Reading Strategy**  
**Questionnaire and Responses**

NAME: \_\_\_\_\_  
I.D. \_\_\_\_\_

### QUESTIONNAIRE ON READING STRATEGIES

**INSTRUCTIONS:** This questionnaire is designed to gather data on reading strategy preferences and attitude to instruction in reading strategy. Please read each question carefully and select the choice which best reflects your opinion or situation. Where a written response is requested, please try to answer as fully as you can. You may use the back of the questionnaire if you need additional space.

1. How many summaries did you complete?
  - a. 0
  - b. 1
  - c. 2
  - d. 3
  - e. 4

If you answered "a", please go to questions 7, 8 and 9.

If you answered "b", "c", "d" or "e" go to question 2.

2. Please rate each of the following reading strategies according to how helpful each was in fostering and/or monitoring your understanding when reading. Please circle the letter on the right that best reflects your opinion.

(a) very helpful	strategy is used most of the time; very effective in promoting/overseeing my level of understanding.
(b) helpful	strategy is used some of the time; was moderately effective in promoting/overseeing my level of understanding.
(c) rarely helpful	strategy was infrequently used; had little effect on understanding or overseeing my level of comprehension
(d) not helpful	strategy was not used because it did not promote my understanding or oversee my level of comprehension.
(e) don't know	unable to comment on the strategy.



**Strategy:**

- |  |           |
|--|-----------|
| 2.1. Asking yourself what you already know about the topic to be read.   | A B C D E |
| 2.2. Making predictions about the topic to be read.  | A B C D E |
| 2.3. Surveying the reading to find the main ideas.   | A B C D E |
| 2.4. Reading the text in small "chunks" for main ideas.  | A B C D E |
| 2.5. Turning headings into questions to find the main ideas.   | A B C D E |
| 2.6. Looking for topic sentences.  | A B C D E |
| 2.7. Underlining <u>only</u> after the main ideas in a chunk of text have been found.  | A B C D E |
| 2.8. Looking back at difficult sections of the text.   | A B C D E |
| 2.9. Looking back when the text does not match predictions.  | A B C D E |
| 2.10 Summarizing important ideas.  | A B C D E |
| 2.11. Relating new information to my clinical experience.  | A B C D E |
|  |           |
| 3. What is your overall opinion of reading strategies? What contribution do they make to your understanding of 180-420 content?  |           |
|  |           |
| 4. Did the workbook on reading strategies stimulate you to analyze the strategies you use to learn when reading? Did you change any of your strategies after analyzing how you learn? If possible, please give examples. |           |
|  |           |
| 5. Do you use the reading strategies you learned from the workbook when reading other nursing or non-nursing texts?  |           |

6. What recommendations would you make for teaching reading strategies in the future?
7. Please identify the reason why you did not complete any summaries/participate further in the evaluation study.
- a. work/family commitments
  - b. course load in 420
  - c. I already have good reading strategies
  - d. other \_\_\_\_\_
8. Would you be interested in a workshop on reading strategies at another time?
- a. yes
  - b. no

If you answered "yes". When would be a good time to have a workshop?

9. Any other comments?

**THANK YOU FOR COMPLETING THIS QUESTIONNAIRE  
PLEASE RETURN COMPLETED QUESTIONNAIRE TO MY BOX IN H460**

**A PROMPT RETURN WILL BE GREATLY APPRECIATED**

**MARY HILES**

Computerized Assessment of Teaching Systems

READSTRA.STU

Student Response Analysis

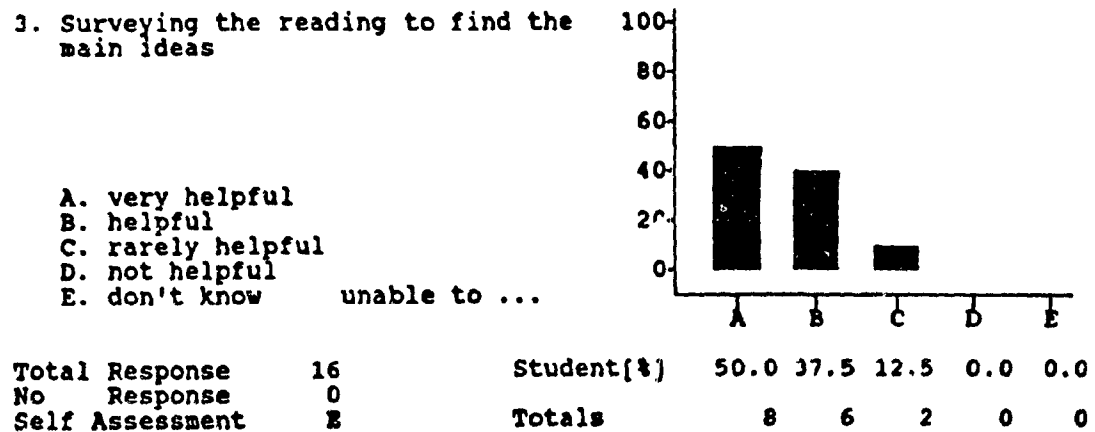
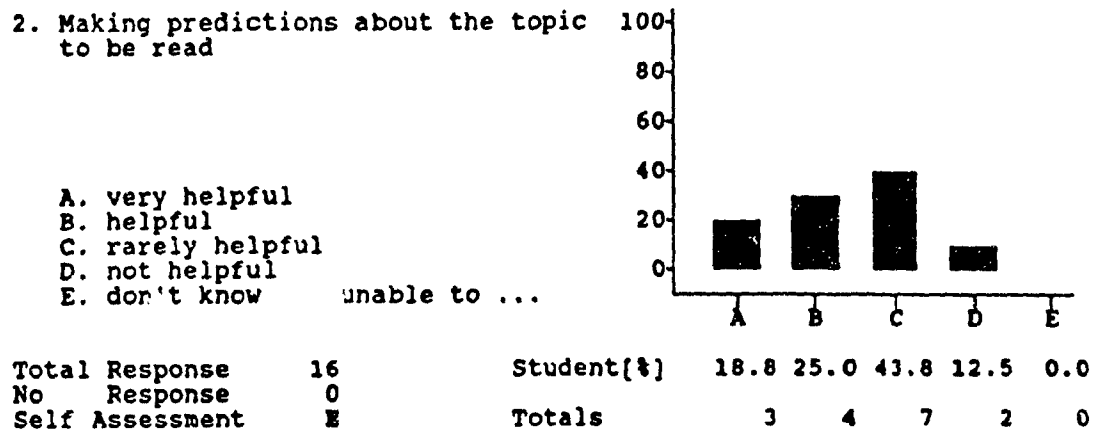
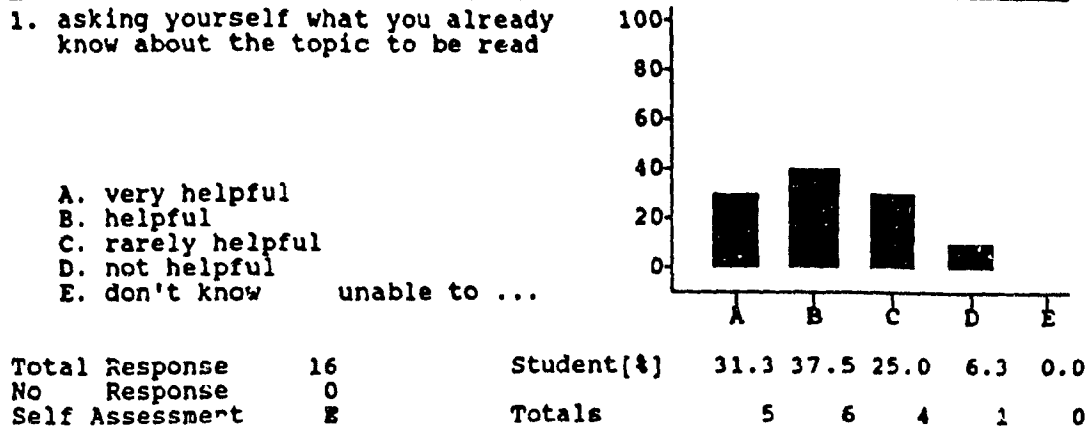


Figure 8: Summary of Students' Use of Reading Strategies

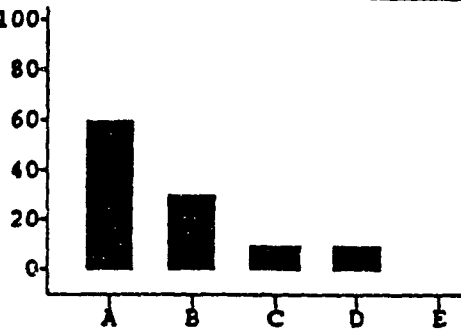
Computerized Assessment of Teaching Systems

READSTRA.STU

Student Response Analysis

4. Reading the text in "small" chunks for main ideas

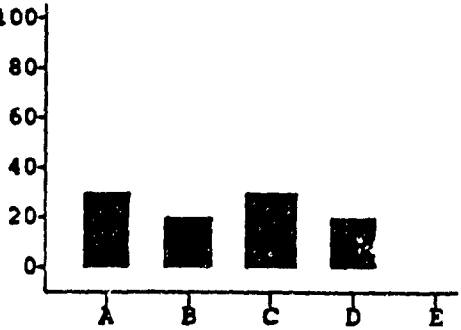
- A. very helpful
- B. helpful
- C. rarely helpful
- D. not helpful
- E. don't know      unable to ...



Total Response	16	Student(%)	62.5	25.0	6.3	6.3	0.0
No Response	0	Totals	10	4	1	1	0
Self Assessment	E						

5. Turning headings into questions to find the main ideas

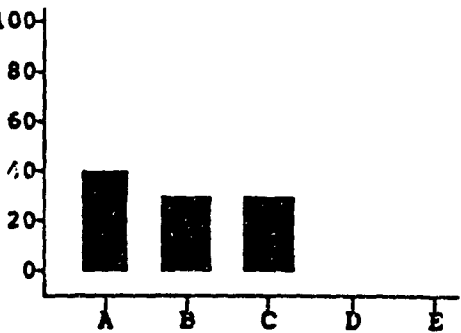
- A. very helpful
- B. helpful
- C. rarely helpful
- D. not helpful
- E. don't know      unable to ...



Total Response	16	Student(%)	31.3	18.8	31.3	18.8	0.0
No Response	0	Totals	5	3	5	3	0
Self Assessment	E						

6. Looking for topic sentences

- A. very helpful
- B. helpful
- C. rarely helpful
- D. not helpful
- E. don't know      unable to ...



Total Response	16	Student(%)	43.8	31.3	25.0	0.0	0.0
No Response	0	Totals	7	5	4	0	0
Self Assessment	E						

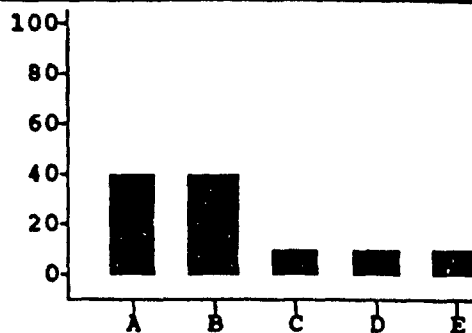
Computerized Assessment of Teaching Systems

READSTRA.STU

Student Response Analysis

7. Underlining only after the main ideas in a chunk of text have been found

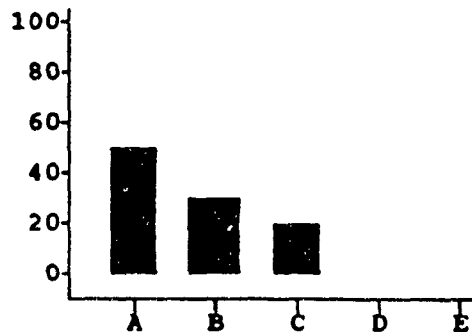
- A. very helpful
- B. helpful
- C. rarely helpful
- D. not helpful
- E. don't know      unable to ...



Total Response	16	Student(%)	37.5	37.5	12.5	6.3	6.3
No Response	0	Totals	6	6	2	1	1
Self Assessment	E						

8. Looking back at difficult sections of the text

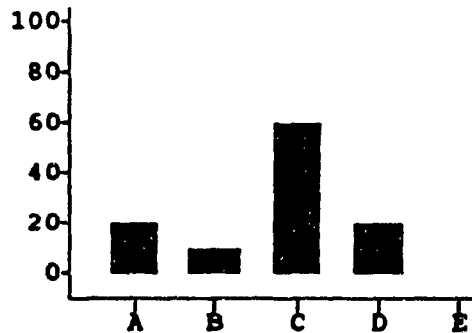
- A. very helpful
- B. helpful
- C. rarely helpful
- D. not helpful
- E. don't know      unable to ...



Total Response	16	Student(%)	50.0	31.3	18.8	0.0	0.0
No Response	0	Totals	8	5	3	0	0
Self Assessment	E						

9. Looking back when the text does not match predictions for me to introduce or discuss issues related to the course.

- A. very helpful
- B. helpful
- C. rarely helpful
- D. not helpful
- E. don't know      unable to ...



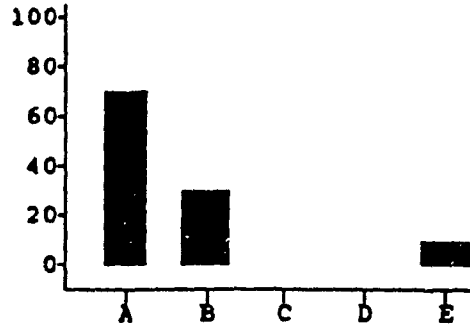
Total Response	16	Student(%)	18.8	6.3	56.3	18.8	0.0
No Response	0	Totals	3	1	9	3	0
Self Assessment	E						

Computerized Assessment of Teaching Systems

READSTRA.STU

Student Response Analysis

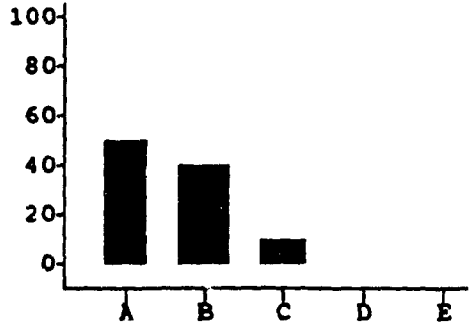
10. Summarizing important ideas



- A. very helpful
- B. helpful
- C. rarely helpful
- D. not helpful
- E. don't know      unable to ...

Total Response	16	Student[%]	68.8	25.0	0.0	0.0	6.3
No Response	0	Totals	11	4	0	0	1
Self Assessment	E						

11. Relating new information to my clinical experience



- A. very helpful
- B. helpful
- C. rarely helpful
- D. not helpful
- E. don't know      unable to ...

Total Response	16	Student[%]	50.0	43.8	6.3	0.0	0.0
No Response	0	Totals	8	7	1	0	0
Self Assessment	E						

**Appendix F**  
**Interview Guideline and**  
**Summary of Interview Responses**

### **Guideline Questions For Interview**

1. What is your overall opinion about reading strategies?
2. Describe the reading strategies you used before instruction. What did you do to understand the text?
3. Describe the strategies you used after instruction. Give examples.
4. What strategies would you use with difficult text?
5. What are your thoughts, feelings about each strategy?
6. Did use of reading strategies help you to understand the 420 course readings?
7. Did the workbook on reading strategies cause you to think about how you learn from text and analyze the strategies you use. Describe.
8. What recommendations do you have for teaching reading strategies?



CATEGORY RESPONSES	INTERVIEW									
	3a	3b	3c	3d	2a	2b	2c	1a	1b	
<b>1.0. OVERALL OPINION</b>										
1.1. helped monitor my understanding	✓		✓		✓					
1.2. made me focus on important points	✓		✓		✓	✓				
1.3. it was a lot more work but worth it	✓		✓							
1.4. helped me understand/remember better			✓	✓			✓		✓	
1.5. helped with exams because thought in terms of questions	✓									
1.6. reinforced strategies I use								✓	✓	
<b>2.0. STRATEGIES USED BEFORE</b>										
2.1. read in chunks				✓						
2.2. reread (many times)	✓	✓		✓	✓	✓				
2.3. underline (too much, too fast)	✓		✓			✓				
2.4. just tried to memorize	✓									
2.5. survey text structure		✓			✓			✓	✓	
2.6. look for topic sentences		✓						✓	✓	
2.7. paraphrase out loud				✓						
2.8. summarize (notes/outlines/maps)				✓	✓	✓	✓	✓	✓	
2.9. use prior knowledge								✓	✓	
2.10. self-questioning								✓	✓	
<b>TOTAL VARIETY STRATEGIES (PRE)</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>4</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>5</b>	<b>5</b>	

Figure 9: Summary of Interview Responses

3.0. STRATEGIES USED AFTER									
3.1. survey text structure	✓		✓	✓	✓	✓	✓	✓	✓
3.2. select/underline main ideas in topic sentences	✓	✓	✓	✓	✓	✓	✓	✓	✓
3.3. turn heading into questions to find main idea	✓			✓	✓		✓	✓	
3.4. summarize main ideas (outline)	✓	✓	✓		✓	✓	✓		✓
3.5. activate existing knowledge prior to reading		✓		✓	✓			✓	
3.6. make predictions		✓		✓			✓	✓	
3.7. summarize main ideas (map)				✓		✓		✓	
3.8. self questioning							✓	✓	✓
3.9. read in chunks		✓	✓	✓		✓	✓	✓	
3.10. use lookbacks						✓	✓	✓	✓
3.11. use questions at end to focus reading									✓
3.12. reflect on prior knowledge after first reading									✓
3.13. use patient examples									✓
CHANGE IN STRATEGY USE (Y/N)	Y	Y	Y	Y	Y	Y	Y	N	N
TOTAL VARIETY STRATEGIES (POST)	4	5	4	7	5	6	8	9	8
4.0 ADDED STRATEGIES USED WITH DIFFICULT TEXT									
4.1. reread	✓	✓	✓	✓	✓	✓	✓	✓	✓
4.2. take little breaks	✓								
4.3. write (outline, map) after each paragraph	✓	✓		✓	✓	✓	✓	✓	✓
4.4. ask teacher, students		✓	✓						
4.5. go back to basics (review past knowledge)			✓		✓			✓	✓
4.6. ask myself more questions			✓		✓			✓	✓
4.7. use more lookbacks/lookforwards			✓						

4.8.	look for explanation in other books, dictionary		✓	✓		✓	✓		✓	
5.0	EFFECT OF INSTRUCTION ON AWARENESS OF STRATEGY USE									
5.1.	summaries help self questioning							✓		
5.2.	...not too good with turning headers into questions			✓						
5.3.	concentrated more on strategies than on text	✓								
5.4.	persistence is part of the process	✓	✓						✓	
5.5.	If I can't remember then I don't understand			✓						
5.6.	making predictions makes me curious				✓					
5.7.	can't get hung up on one strategy - need variety								✓	✓
5.8.	never occurred to me before that my past knowledge was essential to reading				✓					
5.9.	finding the right questions to ask helps monitor understanding				✓			✓		
5.10.	a variety of strategies makes reading more interesting				✓					
5.11.	memorizing doesn't work - must grasp basic concepts					✓				
5.12.	you really hit me with pre-reading strategies					✓				
5.13.	I was reading too fast, now I question more			✓			✓			
5.14.	too many detailed notes means I don't understand					✓				
5.15.	helped reinforce my own strategies				✓				✓	✓
5.16.	mapping makes it easier to know when not understanding				✓				✓	

6.0	EVALUATION OF WORKBOOK AND RECOMMENDATIONS									
6.1.	teach in first semester	✓		✓	✓	✓	✓	✓	✓	✓
6.2.	sequencing is not needed	✓		✓	✓			✓	✓	✓
6.3.	use relevant readings	✓				✓	✓		✓	
6.4.	workbook explains strategies very well				✓	✓				
6.5.	keep the timing (Y/N)					Y			N	
6.6.	keep the introductory class to motivate and provide examples					✓	✓	✓	✓	
6.7.	more examples in workbook					✓				
6.8.	feedback on summaries helped me understand	✓	✓	✓		✓				✓
6.9.	should be optional							✓		
6.10.	should be compulsory								✓	
6.11.	keep the summaries "for the student" - not for the teacher									✓
6.12.	encourage students to edit unnecessary detail from summaries									✓
6.13.	have student compare reading for main ideas vs. read every word.									✓

**Appendix G**  
**Questionnaire on Technical Elements**  
**In the Workbook**

**Formative Evaluation by Students of the Method of Instruction:**

A workbook for reading strategies is in the formative stage of development and I would like your feedback on how it may be improved.

As you use the workbook, please answer the following questions:

1. Was the instruction in reading strategies clear?
  - a) pre-reading
  - b) survey strategies
  - c) reading actively to find the main idea
  - d) summarizing
  - e) using the summary to monitor comprehension
  - f) drawing inferences (relating new information to patient examples)
  
2. Did the workbook provide adequate examples? Did the examples help clarify the instruction?

3. Was the feedback information clear ? Adequate? Did it reinforce learning?
4. Was the vocabulary appropriate (i.e. at your level of understanding?)
5. Was the instruction new or interesting?
6. Would you recommend using a workbook as means of providing instruction in reading strategies?

**Appendix H**  
**Workbook on**  
**Reading Strategies**



# **WORKBOOK ON READING STRATEGIES**

**Mary Hiles**

Developed in partial fulfilment of the  
requirements for a Masters degree in  
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**Introduction:**

The ability to comprehend readings in pharmacology is critical to success in nursing education.

Experience has shown that nursing students who are skilled readers i.e. who use a variety of reading strategies to foster and to monitor comprehension demonstrate a better understanding of pharmacology. Additionally, experience has shown that students who summarize the main ideas of a classification of drugs have an easier time learning specific drug information.

You may ask why take the time to summarize? Why not just read the introductory to a classification of drugs? There are three reasons:

1. It is impossible to remember everything. You need a method to capture the main ideas
2. Summarizing encourages you to become actively involved in searching for meaning. Active learning leads to better understanding and later recall.
3. Summarizing is an excellent way to monitor how well you understand the material. It is a great way to get ready for clinical experience or for tests.

The purpose of this workbook is to provide the student with an opportunity to practice reading strategies in order to improve comprehension of selected pharmacology.

## **OBJECTIVES**

1. **Understand the reasons for using reading strategies.**
2. **Learn how to apply reading strategies to selected pharmacology readings.**
3. **Identify the reading strategies that work best for you when reading difficult text.**

## **INSTRUCTIONS ON HOW TO USE THE WORKBOOK**

There are two sections to this workbook:

- **Section one contains instructions on reading strategies**
- **Section two is a selected pharmacology reading on anti-anginal medications.**

As you work through the instructions for each strategy, you will be asked to refer to the pharmacology reading.

## STRATEGIES FOR READING COMPREHENSION

- STEP ONE: PRE-READING:**
- A) ACTIVATING RELEVANT KNOWLEDGE TO GUIDE READING**
  - B) MAKING PREDICTIONS**

### Background information:

- A)** Research has shown that a reader's background knowledge influences his/her understanding. When the appropriate knowledge base is activated, it is easier for the reader to make sense of the text.
- B)** Additionally, research has shown that skilled readers make predictions about the content of the text before reading in order to monitor their understanding. When the meaning of the text does not match predictions, this is a signal to use strategies to foster comprehension.

### Pre-reading strategy:

As a pre-reading strategy ask yourself:

- Has the physiology of the pharmacology topic been introduced in nursing or biology classes? If so, it is helpful to skim over any notes you may have for key points that were emphasized in text or class.
- What do you already know about the topic to be read?

Example: background, nursing/biology knowledge nursing knowledge that relates to pharmacology

- What predictions about the content of the text can you make?

### Exercise:

The pharmacology reading in Section II is about anti-anginal medications.

- Brainstorm a list of everything you know about anti-anginals and the heart.
- Make a prediction about the article's content.

**Feedback:**

## **STEP TWO: SURVEY THE READING**

(5 - 10 minutes)

### **Background information:**

In this step you are trying to get the best overall picture of the main ideas and the way they are related. You can do this by looking at the way the text is structured and organized. Authors use text structure to convey what they consider is important information.

Research shows that readers who are sensitive to the way the text is structured have an easier time finding the main ideas. In addition, these readers remember more and read faster.

### **Survey strategy**

For 5 to 10 minutes, skim the reading for:

- a) Introduction: does it present an overview of the ideas, background information or links to previous chapters?
- b) Summary: does it present what the author considers important in the passage?
- c) Headings, words in bold print: These are cues to important ideas.
- d) Graphs, illustrations, anything that catches your eye: If it catches your eye, the author probably wanted it to!
- e) If there are no obvious textual clues to important ideas, sample the reading by reading the first sentence of every second or third paragraph to get a sense of the content and how it is organized.

All the above points give clues to the main ideas of the material.

### **Exercise:**

Skim the pharmacology reading on anti-anginals.

What elements of the text structure catch your eye?

What in general is this reading about?

**Feedback:**

**STEP THREE: READING ACTIVELY TO FIND THE MAIN IDEAS IN PARAGRAPHS OR SMALL CHUNKS OF TEXT**

**Background information:**

A paragraph and/or "chunk" (small segment) of text has two basic elements:

- the main idea(s), and
- secondary ideas that support or develop the main ideas.

In this step you are reading actively and selectively to find the main ideas in a chunk of text.

To make sure that you read with maximum concentration, break the reading down into manageable chunks of text that you can read in 3 to 5 minutes.

Avoid underlining as you read. The initial tendency is to underline every sentence without being selective. Underline later, only after you have read 3 to 5 minutes and can say out loud the main ideas in the chunk of text.

**Two reading strategies to find the main ideas:**

1) Use headings and subheadings.

Turn the subheadings into a mental question. When you read the paragraph or chunk of text to answer the question, you will be able to find the main ideas in the chunk of text under the heading.

**Example:**

Look at the first heading in the article "Loosening the grip of anginal pain"

**Nitrates: Still first choice:**

The mental question could be:

Why are nitrates the first choice to relieve angina?

By reading to answer the question, one finds that the main ideas are in this instance:

Nitrates are still the first choice in anginal therapy because nitrates reduce oxygen demand by decreasing preload (venous dilation) and



decreasing after load; nitrates increase oxygen supply by dilating coronary arteries.

**Exercise:**

Look at the second heading in the article.

**"Nitrate tolerance and other problems:**

What question(s) can you derive from this heading?

What main ideas did you find when answering the question/

**Feedback:**

2) Look for a topic (explicit main idea) sentence in each paragraph:

**Background information:**

Main ideas are most often stated explicitly. These are called topic sentences.

Here is an example of a paragraph with an explicit topic sentence. The topic sentence is underlined:

*Pain relief is the most important sign that nitroglycerin has taken effect, of course. But the patient may also feel flushed and develop a headache - a common problem that usually clears up when he adjusts to the medication.*

The main idea in this paragraph is: \_\_\_\_\_

The *topic sentence* is most often the first sentence of a paragraph. Pay special attention to that sentence when reading a paragraph. If the first sentence is not the topic sentence try the last sentence to see if it is located there.

**Exercise:**

Read the section of the article on nitrates.

Do each of the paragraphs have a topic sentence?

Where is the topic sentence located?

**Feedback:**

Occasionally, you may not find a topic sentence in the first or last sentence position. This may mean that the author has decided not to use a topic sentence and you will have to construct the *main idea* from the *supporting ideas*.

Once you have found the *main ideas* in a small chunk of reading:

- 1) Look away from the text and say out loud what the main ideas are.

### Backtracking

Sometimes when you say the main idea out loud, you may have an "*Aha!*" reaction signalling that the information doesn't make sense or that you have forgotten the main idea. Skilled readers pay attention to these "*Aha!*" reactions and backtrack to that part of the text where confusion resides and reread.

- 2) After you have checked what you have learned, go back over your small section and underline or **highlight** the main ideas.
- 3) Ask yourself if you are sure of meaning of the terms used in the topic sentence. If the terms are new or very abstract, it may be helpful to restate the main ideas in your own words.

### Exercise:

- 1) Read actively for 3 - 5 minutes the section on nitrates. Mark the text to indicate how far you have read in that time.
- 2) Check your understanding by saying out loud the main ideas.
- 3) Underline the main ideas.

## STEP FOUR: WRITING THE SUMMARY

### Background information:

Research shows that understanding and recall is improved when the reader organizes the information in a *pattern*.

A summary is a way to pattern/model the main ideas and related ideas.

There are many ways to produce a summary. This workbook will demonstrate two techniques: outlining and mapping. Both have the essential features of:

1. clearly identifying the main ideas
2. clearly relating the supporting ideas to the main ideas.

### Outline:

An outline is a type of summary in which you reduce the reading to its main ideas and supporting ideas. It is important that the main ideas stand out in a summary outline.

Look at the following example:

#### Loop Diuretics

1. *action: prevents reabsorption of salt and water in kidneys:*
2. *therapeutic use: when rapid or massive water loss is needed:*
  - A. *ex. pulmonary edema, hypertension, C.H.F.*
3. *side effects of rapid or excess water loss:*
  - A. *dehydration*
    1. *assess for fluid deficit:*
    2. *dehydration can cause thrombosis/embolism*
  - B. *hypotension*
    1. *assess: dizzy, faint, lightheaded?*
    2. *monitor B.P.*
      - *if B.P. too low, withhold drug*
  - C. *electrolyte imbalance (K, Na, Cl)*
    1. *potassium, sodium lost in urine*
    2. *can cause arrhythmias, cramps, muscle fatigue*
      - a. *monitor electrolyte reports*
      - b. *give potassium rich food or supplements*

**Procedure:**

To have the main ideas stand out in an outline:

Choose a title

Main ideas are:

written concisely  
given a letter or number  
set at the margin

Supporting ideas are:

indented under the main idea  
given a letter or number  
(this shows how the supporting ideas are related to the  
main idea).

More detailed information:

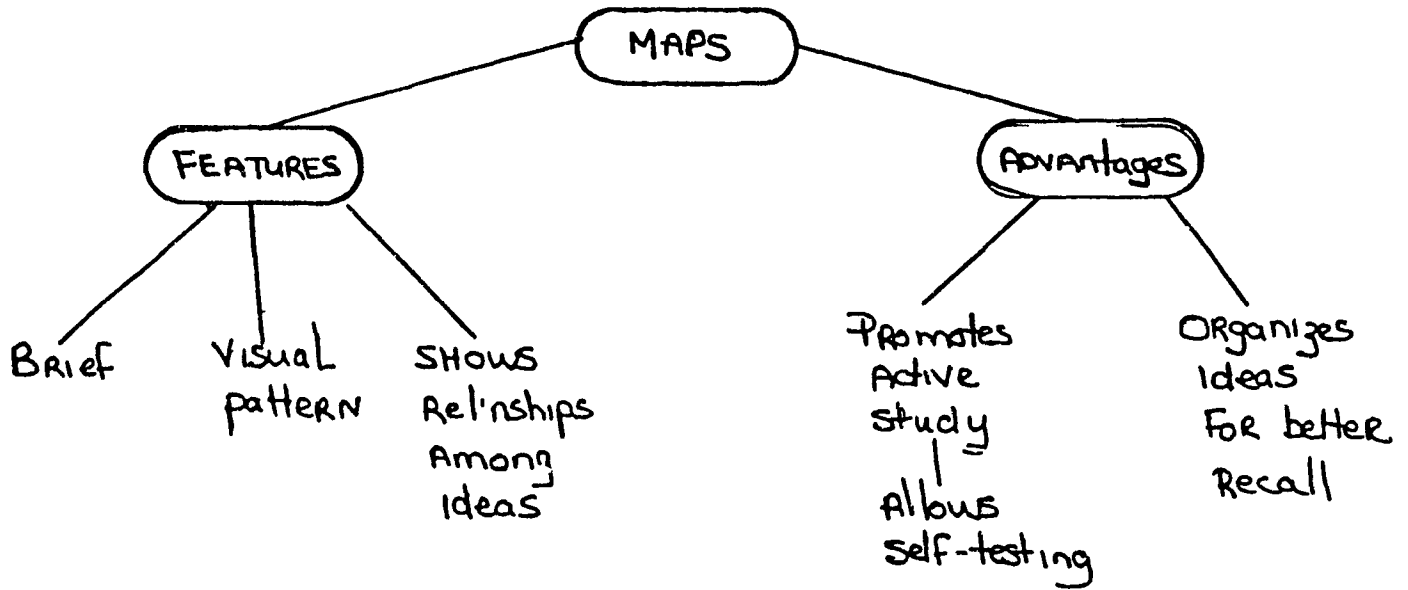
Occasionally, you may want to include more detailed  
information under the supporting ideas.  
If so, indent these under the supporting ideas.

To conserve words:

- Substitute a general term for lists of items, events  
examples when writing supporting ideas.
- Example: "assess for fluid deficit" is a general term covering a long list  
of signs or symptoms.
- A word of caution is in order: make sure you can list all the items  
under a general term when you are testing your recall of the main  
ideas.

**Mapping:**

Mapping (sometimes called networking or diagramming) is a graphic summary. It's characteristics are described below:



**Procedure:**

1. write the main ideas
2. write the secondary ideas under the main ideas.
3. draw a link between the main ideas and secondary ideas.

**EXERCISE:**

Using the outline or mapping technique, summarize the section on nitrates.

## **STEP FIVE: USING THE SUMMARY TO MONITOR COMPREHENSION:**

### **Background information:**

Summarizing not only serves the purpose of reducing lengthy text to essential points, it also is a means to increase your awareness of your reading comprehension. Effective readers tend to engage in self-questioning as they summarize.

### **Exercise:**

When you have completed your summary, use the following checklist to test your comprehension:

1. What are the main ideas?
2. Do the supporting ideas relate to the main ideas?
3. Is the organization of the summary logical?



## **STEP SIX: USING EXAMPLES FROM NURSING**

### **Background information:**

Research has shown that use of examples and/or mental images consolidates learning. For instance, most students find that pharmacology is meaningful when they have given the medications in the clinical area.

### **Strategy:**

- Think of a patient (real or imagined)
- using your summary, think of how you would assess the patient; what implementation measures are required?

### **Exercise:**

- Imagine a patient with angina.
- what assessments would you make to determine:
  - desired effects
  - adverse effects
- what implementation (include teaching) would you do before and after giving anti-anginals?

**SUMMARY OF READING  
STRATEGIES**

- |    |   |                                   |
|----|---|-----------------------------------|
| 1. | <b><u>Pre-Reading:</u></b>              | 1.    Activate relevant knowledge |
|    |   | 2.    Make predictions            |
| 2. | <b><u>Survey the Reading:</u></b>       | Use text structure                |
| 3. | <b><u>Reading:</u></b>                  | Find the main ideas               |
|    |   | 1.    Turn headers into questions |
|    |   | 2.    Look for topic sentences    |
|    |   | 3.    use lookbacks               |
| 4. | <b><u>Summarize:</u></b>                | 1.    Outline                     |
|    |   | 2.    Mapping                     |
| 5. | <b><u>Monitor Understanding</u></b>     |                                   |
| 6. | <b><u>Use Examples From Nursing</u></b> |                                   |