COMPARING THE EFFECTIVENESS OF DIRECT EXPLANATION AND NOTE-TAKING TRAINING ON THE READING COMPREHENSION OF SECONDARY STUDENTS

By

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A dissertation submitted to the Graduate Faculty in Educational Psychology in partial fulfillment of the requirements for the Degree of Doctor of Philosophy, The City University of New York.

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Abstract

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By

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Two methods, Direct Explanation (DE-only) and DE with Note-Taking (DE+NT) were compared in a 3 condition (DE-only, DE+NT, and Control) by 2 grade (9^{th} and 10^{th}) design to determine which method was more effective at improving the reading comprehension of secondary school students. A sample of 150, 9^{th} and 10^{th} grade males of mixed ethnic and racial origins, aged 14-16, from an urban parochial high school were given 7 sessions (pre-test, 5 instructional sessions and a posttest) in their regular global studies classes. A trained research assistant conducted the reading sessions. Reading comprehension was measured using the *Nelson Denny,* Forms H and G as the pre- and posttest, respectively. Daily quizzes from the classroom text and SE scales were used as performance measures. The posttest results show that DE+NT was a significantly more effective training method than DE-only for improving the reading comprehension of high school students. Students in DE+NT and DE-only training groups significantly outperformed the controls that were given no instruction. It was concluded that high school students' reading comprehension was improved when they were trained using DE and NT to understand and retain information from expository text

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Introduction

As we move further into the "information age," it becomes increasingly important for students to master skills for extracting meaning from text, whether in paper or electronic form. In the past, young people who graduated from secondary schools with poor reading comprehension skills could find gainful employment in the crafts and trades. Today, the ability to comprehend, integrate, and apply information stored in print has become a required skill because crafts and trades rely increasingly on computer databases to store and collate essential information. Additionally, equipment that once functioned mechanically (e.g., automobiles) is now guided by computer-based programs. As a result, many contemporary jobs have become closed to students with less than an Associate's Degree. This means that, despite the fact that literacy levels have gone up over the past fifty years (Kamil, Mosenthal, Pearson, & Barr, 2000), we as a society can no longer accept the possibility of *any* of our young people leaving secondary schools unable to read for comprehension. To do so would destine them to a life of sub-standard living. Unfortunately, significant numbers of contemporary high school students are unable to comprehend assigned readings adequately, and few schools provide remedial instruction (Pressley, 1995).

Research on Reading Comprehension Training

Reading research and instruction prior to 1980 focused primarily on decoding and sight word reading. In a major review of research on reading comprehension training at that time, Durkin (1978) found that, although comprehension was often measured, it was rarely taught as a skill in school. This may have been due to the widespread assumption

that reading comprehension would ensue automatically if a student had mastered word decoding and sight-reading.

Durkin's study emerged at a time when the field of reading was becoming more cognitive in approach and, consequently, it stimulated a number of experimental studies using cognitive strategy instruction to improve the reading comprehension of elementary students. It was believed that students needed to create coherent mental representations of the text in order to be able to comprehend it. A variety of experimental studies attempted to test this hypothesis (Rinehart, Stahl & Erickson, 1986; Brown & Day, 1983; Kintsch & van Dijk, 1978). These studies examined the effectiveness of instructing students to use one of a number of comprehension techniques, such as (a) analyzing text into story grammar components (Idol, 1987; Short & Ryan, 1984), (b) question generation (Rosenshine & Trapman, 1992), (c) prior knowledge activation (Levin & Pressley, 1981), (d) summarization, (Armbruster, Anderson & Ostertag, 1987), (e) construction of mental images representing the meaning (Pressley, 1976). These experimental studies demonstrated improvement in comprehension when instructed students were compared to control students who were given no strategy instruction. The studies also showed that multiple strategy instruction was more effective than single strategy instruction, (Brown, & Day, 1983; Been, & Steenwyck, 1984). This evidence of the effectiveness of cognitive strategies in improving comprehension led educators to translate them into classroom instructional interventions.

Methods of Reading Comprehension Instruction

In 1984, Duffy and Roehler created the Direct Explanation (DE) method of reading comprehension from several experimental methodologies: (a) decision making in

reading (Duffy & Roehler, 1982), (b) strategy utility instruction (Duffy et al, 1987), (c) cognitive modeling of strategies (Duffy, Roehler & Herrmann, 1988) and (d) dealing with difficulties in strategy instruction (Duffy & Roehler, 1989). More specifically, DE involves teacher modeling of the cognitive steps involved when applying the strategy. Modeling is followed by guided student practice and "responsive elaboration" (Duffy & Roehler, 1989), wherein the teacher responds with feedback to the particular difficulty an individual child is experiencing in understanding/applying the strategy to the reading task.

In 1986, Palinscar and Brown combined multiple strategy instruction, direct explanation (DE) and social constructivist theory (Vygotsky, 1978) to form an instructional intervention for reading comprehension called Reciprocal Teaching (RT). RT used group methods and multiple strategy instruction to assist students to socially construct meaning from printed text. More specifically, RT involves teacher modeling and explaining of strategies followed by a student leader (chosen by the teacher) modeling and group construction of responses. Based on the early results of RT (*Becoming a Nation of Readers*, 1985), the Commission on Reading of the Department of Education concluded that this approach was successful in improving reading comprehension. Palincsar and Brown emphasized its social constructivist roots (i.e., group construal of meaning) as the source of its success. According to Vygotsky (1978), all higher order mental functions originate in the environment. Speech is the tool through which students acquire knowledge from other members of society. In an interactive dialogue, the adult overtly and verbally presents information, which is internalized by the child through covert verbalization or "inner speech" which, in turn is assumed to produce

consciousness or the internal representation of the external process or strategy. RT was believed to rely on this social mediation of knowledge to convey cognitive strategies for the higher mental function of comprehending text. The adult's dialogue is viewed as an ideational scaffolding (Bruner, 1984) designed to enhance students' understanding of the task temporarily. Thus, the goal of RT is to produce a common understanding of the textual content read, and to facilitate the individual student's internalization of the group strategy for constructing that understanding.

Strengths and Shortcomings of RT and DE Instruction

Despite initial conclusions about its effectiveness, RT has been found wanting in subsequent reviews of research on reading comprehension. Although RT was frequently effective in improving comprehension on training-related materials, it has not been as effective in producing improvements on standardized tests of reading comprehension (Rosenshine & Meister, 1992, 1994). Unfortunately, there has been little effort to investigate the relative effectiveness of the various components of RT training, such as teacher modeling, strategy learning, and student teaching components. In fact, a careful examination of the research on RT supports the conclusion that the effective element in RT may indeed be modeling and not the group processes. Relying on small instructional groups as the vehicle for strategy mastery has another drawback: If the group becomes the source of reading comprehension, how well will this training transfer to situations when the group is not present?

By contrast, the DE approach is designed to promote independent learning because modeling, feedback, and instruction are reduced as students become more independent. Teachers stress when and where the modeled strategies may be used and

their utility value. Modeling and prompting continue until students can autonomously apply the strategies. Students are supported until they achieve strategy mastery independently. Cognitive modeling with feedback and monitoring has proved effective in enhancing reading comprehension. DE has proven to be highly effective in improving reading comprehension on standardized tests (Duffy, et al, 1987). Pressley (1998) concluded that, "Duffy and Roehler's perspective on direct explanation (DE) including mental modeling and subsequent guided practice of students is the most influential to date about how to teach strategic processes in classrooms" (p. 216).

Note-Taking: A Key Self-Regulatory Skill

One of the few shortcomings of DE instruction is that students are given few tangible tools to assist them when attempting to comprehend difficult textual material, especially when they must perform on their own, such as during self-directed studying or test taking. A widely used tool for assisting students to assimilate written information is note-taking (NT). Although academic NT is typically viewed as method for capturing orally presented information from lectures or discussions, it is also widely used with textual sources. Instructional psychologists view the latter form of NT as similar to highlighting, which also identifies key text passages as important. However, NT also requires a person to engage in a variety of additional cognitive activities, such as rendering the abstract meaning of text concrete, raising questions about the meaning of text passages, summarizing text, and drawing conclusions. NT also reduces learners' need to rely on memory when preparing for a test because it provides a record of one's earlier comprehensions.

Because of these advantageous properties, Zimmerman, Bonner, and Kovach (1996) have suggested that NT can be useful as a method for enhancing reading comprehension during studying as well as for retaining information. The demands of the high school curriculum include a wide range of textual material, and there is evidence that NT is a strategy that expert readers frequently use to improve their comprehension (Wyatt, Pressley, El-Dinary, Stein, Evans & Brown, 1992). However, despite these apparent advantages, NT has received relatively little attention as a reading comprehension method to date. In fact, there is not one single entry on note-taking research in the *Handbook of Reading Research* (Kamil, Mosenthal, Pearson & Barr, 2000).

Social Cognitive Perspective on Reading Comprehension

Another advantage of NT is that it can trigger a variety of self-regulatory processes such as: (a) *goals* -- self-set/chosen learning standards (Schwartz & Gredler, 1998), (b) *self-monitoring* -- a process whereby a student engages in reflection regarding personal skills/knowledge, the task and strategy or task knowledge (Zimmerman & Martinez-Pons, 1988), (c) *self-evaluation* -- a comparison of what is known with what needs to be known (Zimmerman, 1989, and (d) *attributions* -- students' views about the causes of academic outcomes (Schunk, 1994, 1989). The importance of these self-regulatory processes in effective human functioning is emphasized by *social cognitive theory* (Bandura, 1986; Zimmerman & Martinez-Pons, 1989). According to this theoretical perspective, students' willingness to use these self-regulatory processes depends on their self-perceptions of efficacy (Bandura, 1977). Students who doubt their ability to behaviorally deploy a particular learning strategy will not be motivated to use it.

Furthermore, a social cognitive perspective views reading comprehension as a personally enacted behavioral skill rather than as passive understanding. Passive levels of reading comprehension skill may be sufficient for reading for pleasure but not for performing optimally on tested material. Since NT reduces the load on memory, it is likely to assist struggling readers to comprehend the expository text material of secondary school classes.

Note-taking as a Complementary Strategy to Direct Explanation

Although DE has been found to be an effective instructional vehicle for teaching reading comprehension strategies to elementary and middle school students (Duffy & Roehler, 1986; Pressley, 1998; Brown, Pressley, Van Meter, & Schuder, 1996; Anderson, 1992), its effectiveness in preparing secondary school students to pass rigorous subject matter tests has not been studied widely. Combining DE with NT with its inherent self-regulatory properties seems advantageous.

DE is an instructional methodology that relies heavily on social modeling, a key learning process also emphasized in social cognitive theory (Zimmerman, 2002). From a social cognitive perspective, student development of skill (such as reading comprehension) involves four levels: observation, emulation, self-control and self-regulation. When learning through *observation* of a model, students discriminate elements of the reading comprehension strategy and experience vicarious reinforcement as the model achieves success. When learning through *emulation,* students duplicate the model's use of the strategy motorically and receive social feedback for its correspondence to the model's. When learning through *self-control,* students perform on their own in a structured setting guided only by a mental representation of the models'

strategy and by self-reinforcing themselves for their correspondence to that modeled standard. When learning through *self-regulation,* students can adapt the strategy automatically to variations in the task.

DE is particularly compatible with the first two levels of this social cognitive account of skill development. In both accounts, teachers model reading strategies and provide feedback until students can emulate use of these strategies independently. NT is particularly compatible with the third and fourth levels of a social cognitive account. NT can assist students to achieve a self-controlled level of functioning because it can help them guide and monitor their efforts to utilize the strategy when reading on their own. When NT becomes automatized, students will be able to adapt their reading comprehension to changing textual sources without relying on outside assistance. This is a self-regulated level of functioning. Thus, NT instruction should enhance the effectiveness of DE for the reading comprehension of secondary students. Consequently this study will attempt to compare the effectiveness of DE +NT to DE-only. It is expected that the combined treatment will prove more effective than DE-only as a method of reading comprehension instruction.

Chapter Two

Review of the Literature

Reading Comprehension Instruction in the U.S in the 1970s

In 1978, Durkin studied the quality and content of instruction in reading comprehension in typical classrooms. The first dilemma she faced was finding a suitable operational definition of reading comprehension instruction in the literature. While several researchers, such as Tovey (1976), had concluded that comprehension could not be directly taught, others (Alvermann & Moore, 1991) defined comprehension instruction as anything a teacher does to help children acquire reading ability . Although teaching decoding, phonics, and structural analysis can all contribute to comprehension, they are insufficient in defining its unique properties. Durkin decided to develop a definition of comprehension instruction based on her observations of in-class activities. In an elementary school study, she observed teachers engaged in activities such as sentence meaning instruction, reviewing instruction, class assignments, preparation for reading, and assessment and prediction. After breaking reading skills work down into eight possible categories, Durkin decided to define comprehension instruction as "...what the teacher does to help children understand/work out the meaning of more than a single isolated word" (Durkin, 1978, p 11).

Because the fourth grade is the transition point between learning to read (i.e., decoding) and reading to learn (i.e., comprehension), the first part of the study focused on these classes. It was expected that this grade would offer the richest data on comprehension instruction. This comprised the first phase of Durkin's research. The second phase of the research focused more broadly on Grades 3-6 to determine whether

individual schools differed in the amount of time they give to comprehension instruction. The third phase focused on an individual student's perspective on the instructional programs.

Each classroom was observed on three consecutive days, varying the days over the five-day instructional week, across classrooms and schools. All teachers knew they would be observed, and each was asked to do exactly what they normally do. The administrators of these schools were asked to provide the best teachers for the study. Classrooms were observed during the reading classes and social studies classes. Social studies was chosen as the subject matter because students would require assistance in comprehending the textual material.

Sub-study one observed fourth grade reading for 4469 minutes and social studies for 2775 minutes. The 24 classrooms observed were in 13 different school systems in central Illinois. All classrooms had women teachers and seven classrooms had teacher-aides. Six of the 24 were third and fourth grade combinations. The class sizes ranged from 11 to 32, with a mean of 22.7. In 8 schools, reading groups were used whereas the remaining schools had self-contained classes. The results revealed that formal instruction in reading comprehension occurred less than 1% of the total instructional time. The overwhelming amount of time was given to assessment, mainly to ascertain if the students had the correct answers to the sets of literal questions taken from the text manual. Even when the teachers provided help with the assignments, they offered little assistance with comprehension. Instead they focused on explaining directions for the assignment. Little support was found for the hypothesis that instruction in reading comprehension had taken place in the social studies classes. For example, the teachers

spent very little time in preparing the students for social studies reading assignments. It appeared to Durkin that teachers assumed that mere completion of reading assignments would improve students' comprehension.

In phase two, reading instruction was studied in three schools. There was little evidence of differences in comprehension instruction among the schools. Two schools had no comprehension instruction, and the third had less than four minutes of it over the 3 days. Although some students were unable to comprehend expository texts in social studies or science, no attempt was made by teachers in any of the three schools to address these deficits during the class time.

Because of these shortcomings in instructional practice, Durkin's research triggered a surge of studies designed to improve reading comprehension. However, some concerns were raised about her study because of the limited amount of time she spent observing classes (i.e., less than 300 hours). Additionally, her study focused on schools in Illinois, which represents a limited geographic area. Reading instruction may have been affected by state curriculum guidelines, which are never mentioned. Finally, although Durkin provides a great deal of raw data in this qualitative study, she did not analyze her results statistically for trends or significance.

In summary, Durkin's (1978) research sought to answer a number of important questions: How do strong comprehenders acquire the skill? Are there effective methods for teaching reading comprehension? Can reading comprehension be taught? Durkin found that there was very little instruction in reading comprehension occurring in the schools, and this conclusion prompted a number of training studies aimed at improving comprehension in elementary students.

Reciprocal Teaching

Among the first instructional methodologies to receive widespread recognition was RT. As mentioned in Chapter 1, this method of reading comprehension instruction relies on group processes, under the tutelage of the teacher, to convey comprehension strategies to group members in order to master classroom based assessments. Palinscar and Brown (1983) conducted three studies designed to teach four reading comprehension strategies: summarizing, questioning, clarifying and predicting. It was hoped that these strategies would foster both comprehension and self-monitoring. RT includes cognitive skills training, explicit instruction in orchestration, overseeing and monitoring these skills, and instruction in the utility and importance of the strategies. Study one compared a locating information (LI) strategy and RT. Individual students were trained in either of the two conditions.

Four, seventh-grade students who were good decoders but poor comprehenders were randomly chosen out of the 7 who were recommended by their teachers and who met the research criteria: (a) at least two years behind on standardized reading measures, (b) below the 20^{th} percentile on local area tests and, (c) had a baseline on the experimenter test below the 20 percentile. Their age ranged from 12.3 to 13.5. Three IQ's were in the low average range and one was average. Two of the students were male and one was black.

A total of 102 four-hundred-word passages of expository text were used. The study consisted of baseline, intervention, and maintenance phases. Students were assigned to one of two sequential conditions: first RT and then LI or the reverse order. Students read texts privately then responded to ten questions based on the reading. The results revealed

that students in the LI first condition obtained scores of 15% during baseline, 50% during a LI phase and 80% during the RT phase. Students in the RT first condition obtained 15% in the baseline, 50% in the RT intervention and 50% during the LI phase. Since there was such a difference during the last phase, students in the RT then LI condition were reintroduced to RT and assessed again. They then attained an equivalent 77% and 88% respectively. There was a significant improvement in performance over baseline. There was evidence of retention of the reading comprehension strategies. After 6 months, the students reported a 60% correct rate. The students also had gains averaging 26 percentile points on generalization measures in the social studies classroom.

Study two was conducted with six students, three groups of two. Only RT was taught, students graphed their results, and tests of transfer were conducted. These students were selected from 16, good-decoders, poor comprehenders recommended by teachers and meeting the experimenter's criteria. Six groups of two students were assigned to the treatment condition and six to the control condition. One student was male, and all but one was white. IQs were in the low average range. Reading passages used during training were long (1500 words) but the assessment passages were shorter (400-475-words). Assessment questions were constructed by the experimenter. Study two had several phases: (a) variable baseline (4 days, 6 days and 8 days), (b) RT instruction for 20 days, (c) maintenance of 5 days of assessment and, (d) long term follow up at eight weeks. The results demonstrated that students had a baseline of 40% correct and they progressed toward a mean of 70% with four of the six achieving 80%. Pairwise contrasts between the treatment and control groups were significant statistically . None

of the students in the control group demonstrated significant improvement. There were no significant differences on generalization measures in social studies.

In study three (Palinscar & Brown, 1983), the participants consisted of the members of two reading groups and two resource room groups. Two classes were taught by the regular education teacher and two by the resource room teacher. Most students were seventh graders, but one group was eighth graders. One student in another group was an eighth grader and two in a second group were sixth graders. Students were all enrolled in schools in rural central Illinois. Seven students were female, and all were white. All students were at least two years behind in reading levels. None of the students were learning disabled or educable mentally retarded. All were adequate decoders but poor comprehenders. The teachers received three training sessions. The instructional procedures were similar to those used in study two, with RT being the only treatment employed. Students charted their strategy use each day. Baseline scores had a mean of 40% with gradual increments over 5-15 days until all groups were scoring at the 70%. Between phase contrast revealed a significant increase in performance.

In a follow-up study, Palinscar (1984) attempted to ascertain which of the instructional processes that were used in the three previous studies was the most effective. Palinscar also sought to determine students' Zone of Proximal Development (ZPD), which is defined as what a student can do independently versus what a student can do with adult/peer assistance. Vygotsky (1978) posits teaching that occurs within the ZPD will be optimal in its effectiveness. Palinscar set up four instructional conditions: (a) RT with corrective feedback, (b) RT with corrective feedback that is discontinued on the fifth day and students proceed by writing their own summaries, questions,

clarifications and predictions, (c) demonstration teaching in which the teacher models the four strategies each day but gives no feedback, and (d) giving the students worksheets with practice activities in the four strategies. There was also an untreated control condition that only experienced the assessments.

Seventh graders, who were good decoders but poor comprehenders, were studied. Fifteen groups of four students in each group (no demographic data are given in the paper) were formed. Materials from the Palinscar and Brown (1983) study were used. There are several phases in this study. In the baseline phase, students worked for five days on the reading passages, and their scores were charted and shared with them. During the treatment phase all groups were instructed daily in the nature of the strategies, how useful they would be, and when to use them. Gain scores (from baseline) were reported along with descriptive data: (a) RT + feedback = 22.7, (b) RT + practice = 14.4, (c) demonstration = 9, (d) treated control = 12 and the untreated control gained about 7 points.

Interestingly, although the ZPD was mentioned early in the study, no subsequent reference is made to it. Another concern in this research is that modeling and feedback features of DE took place before the students engaged in the reading assignments each day, and the students were taught to chart their progress, self-monitor and self correct, two key self-regulatory tasks. This leaves considerable doubt about the cause of the differences in scores. Was it the group processes of RT, the teacher modeling and feedback of DE, or the students' use of self-regulatory processes that was responsible for the improvement in scores? Additionally, since no statistical tests were conducted , it is not possible to determine if the gains were statistically significant. Finally, no

standardized measures of reading comprehension were included in the assessment methodology.

These limitations are important because RT advocates have hypothesized that group verbal interaction with peers under teach supervision was the cause of improvements in students' performance (Palinscar, 1986). . These dialogue processes are expected to prompt the students to internalize group practice of the strategies, thus enabling them to become independent readers. Unfortunately, this hypothesis could not be tested in these studies because the teacher first engages in DE instruction (e.g., modeling and corrective feedback) before the groups engaged in RT.

In 1986, Brown and Palinscar published a study in which they claimed the group process feature of RT training is responsible for improvement in comprehension scores. "The key concept is internalization; that which is witnessed in social settings becomes harnessed as individual cognition." (p. 11). Drawing on Vygotsky's theory, Brown and Palincsar (1986) concluded that the shared responsibility for thinking, the modeling of cognitive processes, and the shared expertise provided support for intellectual growth. The researchers believe that the group offers its members "proleptic teaching" support , that is, scaffolding by more "expert" members of the group . The conceptual problem with this formulation is that all group members in their research are documented as two years or more below grade in reading comprehension. Who is the group expert -- the teacher? How then is this process different from DE except in the seating configuration? Pursuant to that concern is a question of the quality of the dialogues reported in the research. In the early sessions the teacher does most of the group leader work. Over the course of the intervention, he or she gradually shifts control to the students as they

become more and more capable of applying the strategies. An examination of the group dialogues in both early and late sessions of 6, 7, 8 and 9th grade RT sessions reveals that all of the questioning is based on explicit text material. None of the questioning in the recorded dialogues required students to discuss implicit meanings or applications of the text material, and thus it can be asked, how are students acquiring implicit comprehension ability? As might be expected, the researchers reported no difference in scores on assessments of explicit or implicit text-based questions.

In 1990, Lysynchuk, Pressley and Vye conducted a study of RT using 4th and 7th graders. There were 36 fourth grade students (10 females, 26 males; age range 9.2 to 10.10) and 36, seventh grade students (22 females, 14 males; age range = 12.5 to14.1). The fourth graders came from six schools and the seventh graders came from 2 schools. All were English-speaking Canadians who were adequate decoders but poor comprehenders. Groups of two to five students met daily with an experimenter for 13 days. The interventions began with modeling and feedback (two key aspects of DE), and emphasized the utility and application of the instructed strategies along with significant feedback and metacognitive modeling. There were 4 days of DE with modeled strategy instruction and individual practice with feedback on days 5 and 6, 7-11 and 12-13 students gradually took control of the process in the group with continuous feedback and correction from the experimenter. Students' scores were graphed over the course of the treatment and shown to them daily. In the control condition, students met with the experimenter and received assistance with decoding and vocabulary when they requested it. Significant increases from pretest to posttest differences on the standardized measures

were found for both grades 4 and 7. Unfortunately, these researchers still did not separate the effects of RT from those of DE.

Palincsar and Brown's RT model was important because it was among the first attempts to create a viable model of comprehension instruction for classroom use. However, it is important to note that there are some limitations in the design of these initial RT studies. For example, the experimenter worked with small groups of students, and thus the research is limited in its generalizability to regular classroom instructional settings. Furthermore, Palincsar and Brown did not compare RT to a strong alternative instructional method, such as DE; in fact, RT training was preceded by modeling and explanation, which are components of DE training. Was it the group processes of RT, the teacher modeling and feedback of DE, or the student-directed SR that was responsible for the improvement in scores?

Direct Explanation

In 1982, Duffy presented a paper at the Meeting of Reading Symposium. In it he outlined what would become his Direct Explanation (DE) Model of reading instruction. At that time he referred to the reading process as Direct Instruction (DI) but later modified this title to emphasize the explanatory nature of his model. In Duffy's approach, the teacher provides explanations about how the strategy works at the outset of the lesson. This is followed by information about the importance of the reading skill and teacher modeling of the task process.

After observing many reading classes, Duffy reported widespread turn-taking (TT), a classroom management technique in which the teacher assigns oral reading passages to individual students while the remaining students follow along. The reading

student is corrected or praised for his/her performance and the teacher moves on to the next student. Duffy observed that TT focused on the product and not the process of reading, and it led the teacher to offer mainly superficial responses to student reading skills (e.g., "Good job!" "Slow down!"). He postulated that students needed a different form of instruction, which he labeled DE, which put greater emphasis on cognitive modeling and providing corrective feedback and elaboration as the student attempts the task. The teacher's goal is to assist the students to master the process of reading as a "sense making" activity (p.1). The DE teacher: (a) gives explicit information about the reading task and why it is important, (b) clearly tells the students how to do the reading task through cognitive modeling, (c) talks more in the acquisition phase, (d) monitors the students attempts to use the cognitive process providing feedback and elaboration as required, (e) explains, clarifies, and illuminates the reading process as a cognitive problem solving skill. Duffy had observed and taped three teachers over six classroom-reading sessions. TT classroom sessions exhibited predominantly "Socratic questioning" that is, "What, where, why, how etc.", with instruction focused primarily on the correctness of the student's response. In any session where the teacher gave explanation prior to the task there appeared to be a positive correlation with student task mastery.

Duffy (1982) cautioned that research has revealed that TT is only effective with good readers. Poor readers require a more individualized and elaborative model wherein they begin to understand reading as a problem solving, cognitive process that requires active participation with the text in order to "make sense" of it.

In 1984, Duffy and Roehler refined their instructional model by clarifying the scaffolding nature of their elaboration process and re-emphasizing the significance of the

teacher's cognitive modeling. These researchers also stressed that teacher-to-student feedback is reduced as students master the reading task. This refined DE model thus consisted of: (a) teacher cognitive modeling and explaining the importance of the task, (b) guided student practice with teacher feedback, (c) independent practice with feedback. Reinstruction and re-explanation are provided as needed.

In 1986, Duffy, Roehler, Meloth, Vavrus, Book, Putnam, and Wisselman, made their first attempt to empirically verify the theory. They trained teachers to recast basic reading skills as strategies and to teach students in low reading groups to use the strategies when encountering difficult textual passages. . In the regular reading classroom with standard curriculum materials, these researchers assessed whether: 1) trained teachers would be more explicit than untrained teachers, 2) low reading group students taught by trained teachers would be more aware of and more likely to use the strategies in which they were instructed, and 3) would the students of trained teachers score significantly higher on standardized reading measures than students than untrained teachers.

Twenty-two, volunteer, fifth-grade teachers of poor readers in a large, urban, school district in the Midwest participated. In the fall, after a baseline observation of the teachers' ability to engage students, the teachers were randomly assigned by the stratified management level determined in the earlier observation. The students had been assigned to reading groups based on scores on the Stanford Achievement Test. All had scored more than one year below grade level. The average class size was 11.76 and classes were observed for five sessions each.

During each session or immediately afterward the following measures were obtained: 1) teacher explicitness (scored from complete transcripts of the sessions, which were randomly distributed and rated independently by three teams of two researchers, and inter-rater reliability was .80), 2) student strategy awareness scale (five randomly chosen students answered three questions each following the daily sessions) "What did you learn? When would you use it? How do you do it?" 3) Achievement was assessed in April using the Gates-MacGinite Reading Test (2nd ed., MacGinite, 1978) level D, 4) observations at one-month intervals, post-study were conducted until mid-April and again rated. Duffy et al. found that DE training increased teacher explicitness significantly but not student awareness.

Duffy et al. (1986) concluded from their research that: (a) it was possible to change pedagogical methods for reading comprehension, (b) students can become aware of reading strategies through DE, (c) poor readers may take longer than six months to automatically use instructed reading comprehension strategies, (d) it was difficult for teachers to change traditional instruction methods (as stated by several teachers at the end of the study) and (e) that future research in DE needed to assess whether or not the classroom teacher continued to use DE on a daily basis prior to the post-test.

To correct the deficiencies that emerged in the previous research, Duffy, Roehler, Sivan, Rackliffe, Book, Meloth, Vavrus, Wesselman, Putnam and Bassiri (1987) conducted a follow up study using 20 third grade teachers from the same Mid-Western urban district and one alternate from a neighboring suburban district . All teachers were randomly assigned to conditions, and all used curriculum basal readers as texts. The control groups and treatment groups of students were equal on pretest measures of

achievement. Students with behavioral and/or learning problems were enrolled in special education classes and some; were immigrants with severe language deficits. Teachers in the treatment conditions stressed the mental processes that an expert reader uses when attempting to remove reading blockages. Teachers in the treatment condition were taught to analyze the basal reading skills and to carefully model missing skills to their students, verbalizing the steps and strategies needed to engage the text. The teachers were not given scripts but rather were encouraged to respond to the unique demands of the text and the student as they emerged in the classroom. The teachers did prepare each reading session in order to anticipate possible strategic requirements and to be prepared to model them to their students as examples of what good readers do.

All teachers were initially trained during a two-hour session on the first week of school. Treatment teachers received an additional two-hour session in September, October, November, January and February. DE skills, basal lessons, and modeling with feedback were emphasized. The sessions included one-on-one coaching, group discussions, collaborative sharing, and videotape with feedback and classroom observations with individual feedback.

The treatment-control group had two training sessions one in September and one in October. They were taught to used the classroom management techniques of Anderson, Evertson and Brophy (1979) as the basis for their reading instruction. Both groups were trained in *Uninterrupted Sustained Silent Reading* and were given test-taking instruction to share with their students. Classes were audio taped and three students from each group were interviewed after each treatment session. A final concept interview was conducted with the same three random students who were interviewed during the study. A

Supplemental Achievement Measure was designed and given three times at two-month intervals to assess the degree of strategy mastery and understanding acquired by each participant student. Finally, the *Stanford Achievement Test* was given as a post-test and the *Michigan Educational Assessment Program* was given during the following fall to determine maintenance effects.

There were no significant differences in management or attendance between the groups, but there were significant differences for student awareness and teacher explicitness with students in the treatment group outscoring the controls. Analysis of audiotapes showed a continuous improvement in student awareness and teacher explicitness over the course of the study and throughout the school year. Although no significant differences emerged on Part One of the *Gray Oral Reading*, significant differences were found for Part Two, *Paragraph Reading. The Stanford Achievement Test* results also showed a significant difference in reading comprehension scores for the treatment group. Thus, Duffy, et al (1987) demonstrated the power of the DE approach for teaching students to be strategic when attempting to comprehend text.

Self-Regulation

In 1989, Zimmerman defined a self-regulated student as, one who is "metacognitively, motivationally and behaviorally active ... in their own learning process." Such students initiate and direct their own efforts to acquire knowledge and skill rather than relying on teachers, parents or other agents of instruction" (p 329). Zimmerman and Martinez-Pons (1986) reported evidence that high achievers displayed significantly higher use of self-regulatory processes than low achievers.

Schunk and Rice (1993) studied the use of self-regulatory processes with students with reading deficiencies. They identified 52, fifth-grade, remedial-reading students whose scores fell below the 30th percentile of the Survey of Basic Skills (Science Research Association (1985). These were good decoders but poor comprehenders. After random assignment, the sample consisted of 44 students (16 boys, 28 girls), between 10 and 11 1/2 years of age. They were of predominantly lower-middle income and Hispanic background. All were proficient in English. Students were pre-assessed for self-efficacy (SE) using a ten-unit scale, and for comprehension using a 20 question test with 1 to 4 questions about each of the 8 passages. The passages covered Grades 2 (4 passages), 3 (2 passages) and 4 (2 passages). The students were then assigned to one of four treatment conditions: fading only, feedback only, fading plus feedback or no fading/no feedback. All received 35 minutes of instruction for 12 days. Each condition met in 2 small groups of 5-6 students each.

Students received packets, and were taught a five-step strategy that was posted on boards around the room. After teacher modeling of the strategy, children echoed the teachers strategizing as she applied it to the reading. They then attempted to apply it to the passage. The application practice was repeated for four days. During the students' attempts to apply the strategy, the instructor provided corrective feedback.

In sessions five through eight, students in the fading-only or fading with feedback condition, were taught to sub-vocalize the strategy steps, and in sessions nine through twelve, to say the steps silently to themselves as they proceeded. This was accompanied by strategy value feedback during which the teacher linked success to the appropriate application of the strategy. All students received performance feedback. Posttests

included a self-efficacy measure and strategy use checklist along with a parallel form of the comprehension measure. The instruction was designed to promote self-regulation of strategy use and raise perceived self-efficacy, when students realized that they could control their own learning. The results demonstrated that students in the fading plus feedback, fading only and feedback only conditions had significantly higher comprehension scores than the no fading-no feedback condition. Fading plus feedback students had higher scores, but the difference was not significant. The same training groups displayed an increase in perceived self-efficacy. Thus, Schunk and Rice (1993) demonstrated that modeling, feedback and fading influenced reading comprehension strategy use and perceived self-efficacy.

Note-Taking

The earliest studies on note-taking (NT) focused on the role of note-taking as a memory or encoding tool. In 1978, Rickards and Freidman studied 85 volunteer college students. They were assigned to one of three NT conditions: (1) NT and direct review of the notes before a test, (2) NT and mentally review the textual material before a test and, (3) no NT but mentally review the textual material before a test. Half of the students in each group were told to prepare for an essay test and half were told to prepare for a multiple-choice test. Thus, the research design was a 3 (NT conditions) X 2 (test type) factorial model. The test subject was an 80-sentence passage "Evolution of the Brain".

In two ordinary classroom conditions, students were given one of three sets of instructions and then were told to prepare for a test one week later. The article was distributed, and students were allowed to work on it until they were finished. All materials were collected. The following week, students in condition one were given back

their notes and told to review them for ten minutes, whereas students in the second and third groups (no notes) were told to mentally review the material for ten minutes. After the review phase students were give a two-page test. On page one, they recorded anything they could recall from the passage. On page two they responded to a set of completion questions. Each took fifteen minutes to complete. The mean number of sentences recorded was 25.47 out of 80. Type of test did not affect the number of notes taken, but students expecting an essay test took significantly more notes about the meaning of the passage than did those expecting a multiple choice test (means of 24.2 and 22.3 respectively). Additionally, on the free recall segment of the test, it was found that there was a significant effect for study strategy. Students who took and reviewed notes prior to testing averaged 13.81, while no-note review group had a mean of 5.20, and the no notes group scored 4.13. There was no significant effect for expectancy of test mode. It was found that group 1 displayed significantly superior study strategy use to either group 2 or group 3 (means of 17.65, 13.35, and 10.50 respectively).

The results suggest that students who take notes and use them for review outperform those who take notes and don't review them and those who take no notes at all on completion tasks. However, students who took notes, either with or without review outperformed the no-notes group on the free recall measure. The results support both the encoding and external storage hypotheses. Students who took notes recalled more on the free recall measure, and students who both, took notes and reviewed them had better scores on the completion tasks. The implication is that NT improves comprehension of expository text material. Because correct recall requires correct comprehension, it can be concluded that NT is an effective comprehension strategy and memory aid.

Breyzing and Kulhavy (1981) studied a group of 120 undergraduate students' to determine the effect of task demands on note-taking effectiveness and the impact that passage type had on note-taking effectiveness. Students who had been randomly assigned to one of six conditions (twenty students each). Three types of instruction were studied: 1) read only, 2) take notes to use in giving a student lecture notes and, 3) take notes to use in giving a lecture to professionals. The passages were either formal or informal.

In three separate rooms, participants were given either a high or low formality passage and 15 minutes to read it. The passage from a driving instruction manual was to be the subject of a lecture to either high school students or traffic safety engineers. These students comprised the two note-taking conditions, the third was told only to read the passage. Following the reading and note-taking session in all conditions, the materials were collected, and a free recall test was distributed. After 15 minutes, the free recall tests were collected, and a verbal abilities test was administered.

In the low formality condition, the highest scores were obtained in free recall by the students who took notes for a lecture to professionals; while on the high formality measure highest mean scores were obtained by those preparing for a student lecture. Using the verbal abilities scores as the covariate in a multivariate analysis of covariance, it was determined that professional note takers equaled student note takers, but both note-taking groups had scores that were significantly higher than a reading alone group. The results support the role of NT in recall of expository text. Again it can be assumed that correct recall implies correct comprehension. Formal passages for professional lecture produced more verbatim NT but had no effect on content recall. It is clear from this

research that goals, both long and short term, significantly influence performance. This is a key self-regulatory process emphasized in social cognitive theory.

NT appears to create "meaningful learnings" (Ausubel, 1968). In 1984, Slater, Graves and Piche attempted to determine the effects of structural organizers on comprehension and recall of four patterns of text. They believed that reading comprehension requires an understanding of the organization of the text material. To test the questions of: 1) whether or not information about the organization of a passage will improve if information about its organization is provided, 2) will that effect be consistent across various levels of a passage and 3) will the effect be similar across types of passages they study. Participants were 224 ninth grade students who were randomly assigned to one of four treatments: 1) a structural organizer with outline grid, which was information on the organization of the passage and a skeleton outline 2) a structural organizer without outline grid, 3) a note-taking control and 4) a no note-taking control groups.

Students were suburban mid-westerners with 90% being of middle class SES and were divided into good (89th percentile), average (69th percentile) or low (46 percentile) comprehenders. Using passages from a junior high History text of 670-680 words apiece, which were classified by type of passage, the researchers pre-tested students for prior knowledge of the subject. They then gave the students specific directions on how to read a passage. After reading the assigned passage, students were given a twenty item multiple-choice test. Finally, a written recall measure was given to all the students.

In the experimental condition, reading directions contained information about the organization of the passages and structural organizers that students were instructed to

complete as they read or it contained only the information without the outline grid. In the NT control group no information was given about the structure and students were only instructed to take detailed notes. The final control group was only given instructions to read the passage.

Using a between-subjects design, the researchers assessed the effects of passage type and treatment. The analysis of the written recall protocol was tested for number of idea units recalled, and the structural organizers with grid was significantly better. The organizers and outline obviously drew students' attention to material thought to be important by the experimenters. The multiple choice tests were analyzed in two ways, number correct and number correct by level of question. Again, the organizer-with-outline group outperformed the organizer alone and the no treatment control, but there was no difference between the treatment group and the note-taking alone group. Both outline and note-taking students scored 18% higher than the other two groups and these differences were significantly better than the no outline and no notes conditions. The researchers were surprised by the powerful effect of NT and, based on their results, they concluded that" note-taking is very likely to markedly improve students' comprehension and recall" (p. 29). Essentially, the outline facilitated the recall of specific information but it was the writing process whether on the outline or on self-generated notes that assisted students' ability to respond to objective questions. There was no follow-up study to assess this impact.

Throughout the rest of the 1980s and 1990s, NT was only examined as a factor in college students' lecture notes, but some information on note-taking can be gained from these studies. For instance, the study conducted by Einstein, Morris and Smith (1985)

focused on individual differences in NT. These researchers looked for those aspects of NT that were germane to the more successful students. They wondered if NT served both an encoding and external storage function (Carter & Van Matre, 1975; Peper & Mayer, 1978). NT was hypothesized to increase attention, and elaborate ideas for processing and organization. Note-takers should have better recall even when they cannot review their notes (i.e., when only encoding occurs). This encoding effect may be due to the attention and effort necessary to write the notes. It is also possible that NT forces the listener to engage in different form of processing of the material than that which is required to merely attend to the lecture. Does NT encourage deeper comprehension and organization of incoming information? If NT functions as a quantitative aide, note-takers should recall all types of information in a given lecture better. But if NT serves primarily as a processing and organizational tool, it should increase recall of more salient information.

In the first of two studies Carter and Van Matre (1975) examined whether or not NT had an effect on the type of information recalled. Students in this study were not permitted to review notes, and so NT could enhance only the encoding/organizational aspects of note-taking. Twenty-four college students were assigned to each of two groups (N = 48). They listened to a 10-minute tape. They had not been told that they would be expected to recall the information. Half were told to take notes in their normal note-taking style. The others were told only to listen. Although the note-taking group recalled more than the listening group, the difference was not significant. There was also no difference between the groups on recall of important information by level of importance. However, note takers recalled more material of high importance. It appears that NT improves recall of high-importance material. The different recall patterns indicate that

NT serves an encoding function. The study also examined the effect of NT as a memory aid. The subjects tended to recall the information in their notes (44% versus 6% for data not in their notes). Recall was related to the content of the notes and not to the style of NT.

In the second study (Peper & Mayer, 1978) processing differences between effective learners and less effective ones were examined. Quality of notes and recall scores were correlated and half of the students were permitted to review notes before testing and half were not. In a 2 X 2 X 2 design, the researchers evaluated successful/unsuccessful, immediate recall/delayed recall, and review/no review. Using student GPA as the criterion, 24 students were assigned to each of four conditions. Then randomly eliminated until ten were in each group (N = 40). Successful students had a GPA of 3.12 and VSAT of 575. The other GPA = 1.93 and VSAT = 485. All students were told to listen to the taped lecture and take their notes as usual. Students in the immediate recall condition were then told either to review their notes or were given math puzzles to solve. Then both were given ten minutes to write down as much of the lecture as they could recall. As expected, the successful students had higher immediate recall than the others (M=29.4, 22.2) when given no review. With review, there was less difference (M = 28.8, 26.8), and these results were not significant. On the test of delayed recall, successful students outscored less successful with no review (M= 6.8, 5.1) or with review (M= 23.3, 20.5). But the delayed recall with review group showed a significant effect compared to the delayed recall without review group. After one week, subjects who reviewed their notes recalled four times as much as those who didn't, and there was no interaction with the students' success level. These differences involved the recall of

highly important material. There were no differences in recall of medium and low importance material. These results indicate an encoding function of NT because note-takers recalled more of the important material than students who did not take notes. The conclusion is that NT facilitates integrative processing that has an effect on far transfer tasks and provides external storage and retrieval cues.

This integrative processing hypothesis was studied in 1991 when Kiewra, Dubois, Christian, Meyerhoffer and Roskelley examined the effects of note-taking on encoding and external storage... They studied three conditions, (a) take notes/no review, (b) take notes/review and 3) borrow notes/review. They hypothesized that the generativity took place during the review of the material when students' minds were free of the attending and note-taking demands of the classroom. If this were true then students who reviewed notes (their own or other's) would perform better than those who took notes and did not review or attended the lecture and did not review. They also examined the effect of NT techniques: 1) standard, 2) linear or 3) matrix. Linear notes follow topic and subtopics in an outline form, whereas matrix notes are two-dimensional with main topics across the top and subtopics down the side producing cells for notes that correspond to both the topic and subtopic. They expected that both linear and matrix notes would have more effect on performance than conventional notes because both of these methods foster internal connections by organizing and associating ideas to create two or more retrieval paths. Matrix notes also foster synthesizing ideas across topics enabling greater correlation and so were expected to outperform linear note takers.

Ninety-six undergrad psychology volunteers were randomly assigned in a 3 X 3 study. NT function had three cells: encoding (take notes/no-review; encoding and storage

(take notes/review notes) and, external storage (borrow notes/review). Students viewed a videotaped lecture for 19 minutes. Note-takers received four pages of lined paper: linear outline with topics and subtopics, or matrix notes (head and side topics). Measures administered were a cued recall test, (possible score 121) and a five-item synthesis test. The no-review group was immediately tested. The review group looked over their notes for the test time (22 minutes) and then was tested. The control group viewed the lecture and was tested. Subjects who took and reviewed notes outperformed all other conditions significantly, and matrix notes were more effective than conventional or linear notes. Subjects who took and reviewed their notes and those who borrowed and reviewed notes were both significantly higher than those who took notes but did not review them. Technique effects were not significant. It is not possible to separate out the effects of repetition or generativity from these results. Of interest though is that the encoding-only group did not outperform the borrowed notes group on the synthesis test. The researchers conclude that reviewing notes requires some form of generative processing that associates the new information in some idiosyncratic way that facilitates recall. Finally, taking notes was no different than just listening to a lecture when there was no review. The researchers believe that the note-taking process alone does not assist recall or memory. The external storage function of NT appears to surpass the encoding function for synthesis, and matrix notes are more effective than conventional or linear notes for recall and synthesis. It seems that students who take and review organized notes are more successful than those who just take notes and don't review and those who review another's notes. NT requires the student to activate self-regulatory behaviors that include selection of strategies, directed attention, self-monitoring and self-efficacy beliefs that

NT will make a difference. Reviewing notes allows students to monitor their learning and adapt their understanding of the class material.

In 1995, VanMeter, Yokoi and Pressley interviewed college students to determine how their perceptions of the NT process impacted performance. NT during a lecture requires self-regulation (Zimmerman & Schunk, 1989). No studies had previously been conducted to determine the effect of self-regulatory behaviors in NT. Previous studies were isolated from course content so that task demands and the adaptation they require were never addressed. They used an ethnographic interview method (the interview process evolves as the study progresses). The 225 participants were undergraduates at an eastern university. In general, all students reported taking notes. Students described their efforts at being goal directed in taking notes. Each focused on the short and long term goals of mastery and success. Some used NT as a self-regulatory mechanism, "It forces me to pay attention to the lecture". "...stay awake...", "...concentrate". Others used NT as a learning strategy, facilitating the understanding of lecture content. Most students used the notes as a study aid for future tests. All students reported both long term and short-term goals for their NT.

Regarding what students put into their notes, VanMeter, Yokoi and Pressley (1995) found that lecture material that was redundant with the course text, on the board or in the course syllabus, was important to note. Many students reported that they attempt to note relationships and connections between ideas as they write. Some NT is verbatim but most notes are paraphrased in order to be shorter. Students were aware of their various classes of notes. In cases where professors provide outlines and are more organized in their lectures, NT may be less essential to success. All students reported

that the quality of the notes depended on the organizational style of the lecturer. Many students reported modifying their NT techniques to match the lecture style or adjusting note-taking style after the first test. NT behavior is adjusted according to the student's prior knowledge of the course content. Additionally, students adapted their NT style when they discovered how effective or ineffective the notes were as review tools. Some students reported rewriting their notes from class when going over the course material. Finally, notes were more personally meaningful when they involved prior knowledge or confusion that needed a follow-up. VanMatre and colleagues concluded: (a) NT serves multiple goals, (b) students have multiple NT strategies, (c) note takers are selective in choosing material and noting its importance, (d) note takers evaluate the effectiveness of their notes and adjust according to the task demands, (e) note takers coordinate notes with other resources (classmates and text books), (f) note takers reflect on their note-taking style and adapt them to maximize their effectiveness. Most of these behaviors are adapted both within and between courses so that students' note-taking efficacy increases over their school years. NT appears to involve self-regulatory processes that students use and adjust to achieve future goals. Can reading comprehension be one of those goals for high school students?

In 2000, Faber, Morris and Lieberman attempted to answer that question. With a group of 115 ninth graders from an urban junior high school they examined the effects of note-taking training on the reading comprehension skills in their World Cultures classes. They compared the students in their comprehension of both high and low interest passages. During active note-taking, the reader abstracts and assimilates material in order to make it personally understandable. Most prior research cited by Faber, Morris and

Lieberman found that ninth grade students were unable to encode during note-taking and instead took verbatim notes. These researchers questioned whether or not these students could be taught to distinguish essential, higher-level information from less essential lower level information.

Faber and colleagues defined low interest material as expository text that is explanatory in nature and high interest material as expository text on topics of interest to the students. Students need strategies they can use to facilitate their own learning. Examples NT strategies include webbing, concept mapping, two column notes, KWL format, Power notes and graphic organizers. NT instruction had three primary goals: 1) to prepare students to tie their prior knowledge to the textual material and to help them determine the author's organizational method, 2) to teach them to record main ideas and details while reading, and 3) to teach them to self-check their understanding of what they have read. In a within-subject design, students read both high and low interest material. Nine classes, totaling 115 participants in an urban area, with ages from 13 to 15 were randomly assigned to classes. Faber and colleagues gave both a pre- and posttest prepared by the classroom teachers, with 22 questions each. Five classes were given note-taking instruction. The remaining four classes acted as controls with no additional instruction. Students with scores below the 36 percentile were classed as low ability, and those above the 80th were ranked as high ability.

The treatment classes were taught to activate prior knowledge by self-questioning, examining headings, illustrations and captions. These ideas were then written on the note sheet. They then were instructed to create a broad question about the topic they were about to read. They were taught to use the Cornell method of NT, which is a two-column

format in which 1/3 of the space is for topics, and 2/3rds is for notes. Finally they were taught how to continuously check themselves for understanding and the relevance of the part being read. Teachers modeled, used "think alouds" and questions for two hours a day over a four-day period. All participants were then given reading comprehension tests on both low and high interest readings. NT had a significant effect on students' scores on the low interest passage. There was no interaction between ability level and test scores for NT. Results indicated a significant effect for NT training on the low interest passage, and improved scores on both comprehension measures for all ability levels. They concluded that longer training was needed for students to become automatized in using notes on all passage types. Students had failed to take appropriate notes on the high interest passage.

Overall, the research suggests that NT is planned, organized, reread, and often rewritten. NT serves both an encoding function and an external storage role. It requires a set of self-regulatory processes that are directed at the attainment of a particular goal, namely understanding textual material. These self-regulatory processes compel students to reflect upon and organize material that they have heard/read into a personal record.

Summary

The DE instructional intervention has proven effective in teaching elementary and middle school children comprehension skills through use of modeling and feedback. However, many students reach secondary school without sufficient skill to read grade level assignments. Few schools offer training at this level, and students are typically left to their own resources to understand assigned readings. An important tool that can assist these at-risk students when reading on their own is NT. NT not only enhances cognitive

functioning underlying reading comprehension, it triggers a variety of self-regulatory processes. Because reading is a life-long, predominantly solitary, activity, NT can be an invaluable resource in improving a person's future functioning.

Hypotheses

Consequently, this study examines the impact of two interventions, comparing the modeled processes of DE to the same DE instruction enhanced with the self-regulatory processes of NT on secondary school students who are reading below grade level. It is hypothesized that the self-regulatory processes inherent in the NT instruction along with DE is more effective at improving reading comprehension on standardized measures of reading comprehension than the DE alone. It is further expected that students in the NT condition would master comprehension strategy use at a significantly higher rate than those participating in the DE alone condition, and that this mastery would be mediated by self-efficacy beliefs.

Chapter Three

Method

Sample

One-hundred-fifty boys from a single-gender parochial high school participated in this study. The boys were 14-16 years of age and from low to middle income families. Approximately 10% were Black, 15% were Latino, 10% were first generation Eastern-European, 5% were first generation Western-European, 2% were Asian and the remaining 50% were third generation-plus, western-European. The school is an urban, college preparatory, Catholic School.

Design

In this between-subjects research, the sample was six, intact Global Studies classes. Three classes were chosen from the ninth grade and three from the tenth grade. Students are placed into their English and Global Studies classes based on their reading scores on the Secondary School Placement Test (Scholastic, 2000), and the three classes with the lowest reading scores were chosen from each grade level. Students in these classes are two or more years behind national norms in reading skill. One ninth grade class and one tenth grade class was randomly assigned to each of three experimental conditions: 1) DE, 2) DE+NT and 3) Control. Thus, a 3 (conditions) X 2 (grades) research design was used. Students were pre-tested and post tested for reading comprehension, the primary dependent measure. Prior to the start of the study an ANOVA was performed using the reading scores from the SSPT to determine if there were differences between the classes prior to the intervention. There was no significant

effect for grade, class or interaction on this measure. Student groups were equal prior to treatment.

Measures

Reading comprehension. The dependent variable was measured by the *Nelson Denny Reading Test*, (ND) Forms H & G (Brown, Fischco & Hanna, 1993). ND is a standardized reading measure, with alternate form correlation of .90. Additionally, the publishers report a correlation of .72 between comprehension scores and advanced reading ability in courses. It was chosen because it assesses reading, using essays, and excerpts from literature that are closely related to the expository text reading demands of the secondary school curriculum. The test consists of seven separate reading passages, which are each followed by a combination of literal and interpretive questions (total raw score = 38, 19 literal and 19 interpretive per form). The ND involves grade and age equivalents along with percentile ranks. Additionally, daily quizzes on the social studies text material were given during each training session. These consisted of a section of reading on a subtopic of the chapter, such as one chapter covered the *Early Civilizations* period in American History and a subtopic was *River Valleys*. This reading passage was followed by 3 multiple choice literal/interpretive questions, producing a reading score of 0-3. These were given at the end of each instructional session, days 2-6. Total score range for each student is 0-15.

Self-Efficacy Scales. Following procedures outlined by Schunk (1996) i.e. that domain specific individual measures are reliable, (Schunk used a one item, 10 point Likert for a short reading comprehension task) self-efficacy was measured using an item referring to participants' beliefs about their capacity to perform the comprehension task.

"How sure are you that you can answer all three questions correctly?" The scales are intended to assess the student's sense of confidence in reading as the practice and instruction proceeds. Each item involves a score of 1-5, with one being very unsure, two being pretty unsure, three being undecided, four being pretty sure, and 5 being very sure. The total possible score ranges from 1 to 5, per scale. The self-efficacy scale was administered before the quiz at the end of each of the five instructional days and a three item Scale was given with the post-test session. The posttest SE scale used the same Likert options but asked "How sure am I that I will get 100% right? ...75% right? ...50% right?" The total possible SE for posttest score per student can range from 5 to15.

Classroom Observations. Each treatment condition was observed twice at random times during the course of the five training days. The researcher used a twenty-item checklist from the treatment protocols to assess the fidelity of each of the two treatment conditions. The checklist contained neutral items (those that could be in either condition) and condition specific items (e.g., modeling of verbal or note-taking summarizations) (see Appendix A).

Procedure

Permissions. Prior to conducting the study, written permission was obtained from the school administrators, the class teachers, the students' parents/guardians, and each individual student. Participant anonymity was maintained with independently assigned ID numbers, which had been randomly allocated to the individual students.

Schedule. Each experimental condition had seven, 45-minute daily sessions (two testing sessions and five instructional sessions). These sessions were conducted on the same school days in each condition, but not necessarily at the same time of day. Since the

proposed school has a seven-day rotating schedule, time of day effects were counter-balanced.

DE +NT Teacher Training. One reading teacher was trained in two full-day workshops. The teacher was unaware of the research hypothesis. Her training involved the following topics:

Summarizing as a reading strategy,

Scanning, predicting, heading analysis, key word, questioning.

Cognitive modeling and student emulation,

Guided practice,

Individual feedback and fading,

NTas a reading strategy,

Effects of self-efficacy on performance,

Importance of emphasizing strategy utility,

Administering the ND (forms H & G)

Administering the Quizzes,

The experimental instructor was trained to understand both the theoretical and practical bases of DE and NT and to apply these principles during the sessions. The goals of enactive mastery through self-observation, choice, and self-reaction were emphasized for the NT training process.

The teacher gave a DE and DE+NT demonstration lesson for the trainer before the study formally began. Teachers in the Control condition were instructed to conduct their global studies classes using the usual teaching methods, which included lectures,

worksheets and seat work. The teacher was given a daily script for each class which guided her through the instruction each day.

Phase One: Pre-test. All classes (Treatment and Control) were administered the *ND, Form H* (Brown, Fishco, & Hanna, 1993) during session one.

Phase Two: Instruction. Sessions two through and including session six: During the Instruction Phase students in both ninth and tenth grade treatment conditions used the same course material from the last five chapters of the text book. Students in both DE and DE+NT conditions were given instruction and practice in the summarizing strategies. (See protocol in Appendix A) This instruction included: teacher modeling, student emulation, guided practice, feedback and fading. The treatment conditions, both DE-only and DE+NT used the last five chapters of the classroom social studies text for the reading material. Pre-selected sections were read and summarized. In the DE-only condition, upon completion of the modeling, attempts at verbal summarization began immediately. In the DE+NT condition the teacher explained and modeled the NT procedure. The sessions ended with the completion of an assigned selection and a quiz along with the process measures mentioned earlier.

In the DE-only and DE+NT conditions during sessions two through six, the teacher modeled and explained the steps in the summarizing strategy, which included: (a) scanning for key features, (b) activating prior knowledge (i.e., What do I know about this?), (c) predicting (i.e., What is this about?), (d) questioning (i.e., What does this mean? Why did this happen?) and, (e) summarizing a paragraph into one sentence. The teacher also stressed the utility of the summarizing strategy. Students in the DE+NT condition were instructed to take notes on the answers to their summarizing questions,

while DE-only students were instructed to conclude their self-questioning with a one sentence summary of the reading. All students in DE-only or DE+NT participated in individual guided practice with individual feedback. This was followed by independent practice with feedback using the text readings. DE+NT students checked their summarization notes. DE-only students repeated their summaries verbally to the teacher. Students continued independent practice with feedback. The teacher continued to provide individual feedback throughout the five instructional sessions.

During the instructional phase for the two treatment conditions, the students in the Control condition participated in their regular global studies class activities, i.e., lectures, worksheets and seatwork. Two random "Treatment Fidelity Observations" were made using the 20 item protocol checklist. A score of 0 was given for on protocol activity and a score of 1 was charted for off protocol.

Phase Three: Posttest. All classes (Treatment and Control) were administered the *ND, Form G* (Brown, Fishco, & Hanna, 1993)and the 3 item post-test Self-Efficacy Scale.

Chapter Four

Results

Posttest Analyses

The posttest data were analyzed with a two factor (experimental condition X grade) analysis of covariance, with the posttest Nelson Denny (ND) and self-efficacy (SE) as the dependent variables respectively. The pretest ND functioned as the covariate. Post hoc *t*-tests were subsequently performed comparing the three conditions in pairs. Table 1 displays the means and standard deviations for each post treatment measure.

Table 1

Dependent-Measure Means and Standard Deviations

for Each Experimental Group by Grade Level

	Experimental Group					
Dependent	Direct Explanation		Note Taking		Control	
Measure	9	10	9	10	9	10
Pre Nelson Denny (ND)						
Mean	10.88	13.55	13.13	13.80	11.42	13.36
SD	4.76	5.65	5.37	5.45	5.41	4.67
Post Nelson-Denny (ND)						
Mean	11.28	16.52	15.48	17.84	11.79	13.40
SD	5.52	6.55	4.79	6.46	5.52	4.19
Range	3.77	3.96	3.87	3.72	4.46	4.50
Post Self-efficacy (SE)						
Mean	10.16		10.73			
SD	2.33		2.19			

Nelson-Denny test. The ND reading comprehension posttest data were analyzed with a 3 (experimental conditions) X 2 (grades) analysis of covariance model. There was a main effect for condition, $F(2,135) = 9.27, p = <.01$, but there was no main effect for grade, or condition X grade interaction. Post hoc *t*-tests revealed a significant

difference between the DE-only condition and the DE+NT condition, t (96) = -2.25, $p <$ .03 and the DE+NT and Control, t (95) = -3.76, $p < .001$. The difference between the DE-only condition and the Control was not significant, t (97) = -1.11, $p < .27$.

Effect Size

The analysis produced an ETA squared of .122 for the effect of the treatment on reading comprehension. This is considered moderate to large in size (Green & Salkind, 2003).

Reading Comprehension Gains

Mean gains on the Nelson-Denny from pre-test to post test were .21 for the Control Group, 1.23 for the DE-only Group and 3.40 for the DE+NT group. This equates to a six month gain in Grade Equivalent for Comprehension in the DE+NT Group, and a one month gain for the DE-only Group. No grade equivalent gain was noted for the control group.

Self-Efficacy. The posttest self-efficacy data were analyzed using a 2 (DE and DE+NT conditions) X 2 (grade levels) analysis of covariance with pretest Nelson Denny scores used as a covariate. No multivariate effects were obtained for condition, grade, or the condition X grade interaction. A zero-order correlation of .44 ($p < .01$) was found between self-reported self-efficacy for reading and ND comprehension scores. A Cronbach's alpha was conducted to determine internal consistency on the 3 item SE measure. It produced a coefficient of .78, demonstrating internal consistency and reliability

Practice Analyses

Reading comprehension for quizzes. To examine the effects of learning across the successive quizzes, a multivariate analysis of covariance was performed on the 5 quizzes using the pretest ND as the covariate. It revealed a multivariate main effect for condition, $F(1, 84) = 6.19, p < .02$, a multivariate main effect for grade, $F(1, 84) = 8.89, p < .01$, and a multivariate condition X grade interaction, $F(1, 84) = 6.86, p < .01$. Means for these groups are presented in Table 2. Students in the DE+NT group displayed more reading comprehension than those in the DE-only group, and 10th graders displayed more comprehension than 9th graders.

As a follow up a univariate analysis of covariance was performed on each of the five quizzes using the pretest ND as the covariate. There was a significant main effect for Condition on quiz 2, $F(1, 89) = 4.76, p < .03$ and on quiz 4, $F(1, 88) = 8.41\ p < .01$, but not on quiz 1, $F(1, 89) = 1.43, p < .24$; quiz 3, $F(1, 88) = .18, p < .67$; or quiz 5, $F(1, 87) = .65, p < .42$. The DE+NT group surpassed the DE group on quizzes 2 and 4. There was a significant main effect for Grade for quiz 2, $F(1, 89) = 9.18, p < .01$, and for quiz 5, $F(1, 87) = 4.84, p < .01$, but not for quiz 1, $F(1, 89) = 2.06\ p < .133$; for Quiz 3, $F(1, 88) = 2.305, p < .11$, or for quiz 4, $F(1, 88) = .614, p < .54$. Tenth grade students surpassed the 9th graders on quizzes 2 and 5. The main effect means are presented in *Table 2*

Reading comprehension means for daily quizzes

	Experimental Group		Grade		
	DE-only	DE+NT	9	10	Grand Mean
Quiz 1 M	1.64	1.81	1.55	1.90	1.72
Quiz 2 M	0.64	1.04	0.56	1.12	.84
Quiz 3 M	1.08	1.20	0.97	1.32	1.14
Quiz 4 M	0.61	1.22	0.97	1.32	.92
Quiz 5 M	1.55	1.71	1.33	1.92	1.6

Scores can range between 0 and 3.

Interactions

There was a significant condition x grade interaction for quiz 1, $F(1, 89) = 7.62, p < .007$; for quiz 3, $F(1, 88) = 11.18, p < .01$; and for quiz 5, $F(1, 87) = 6.60, p < .01$. Quiz 2 produced an $F(1, 89) = .06, p < .81$ and quiz 4 had an $F(1, 88) = .01, p < .94$. The significant interactions are depicted individually in Figures 1, 2, and 3.

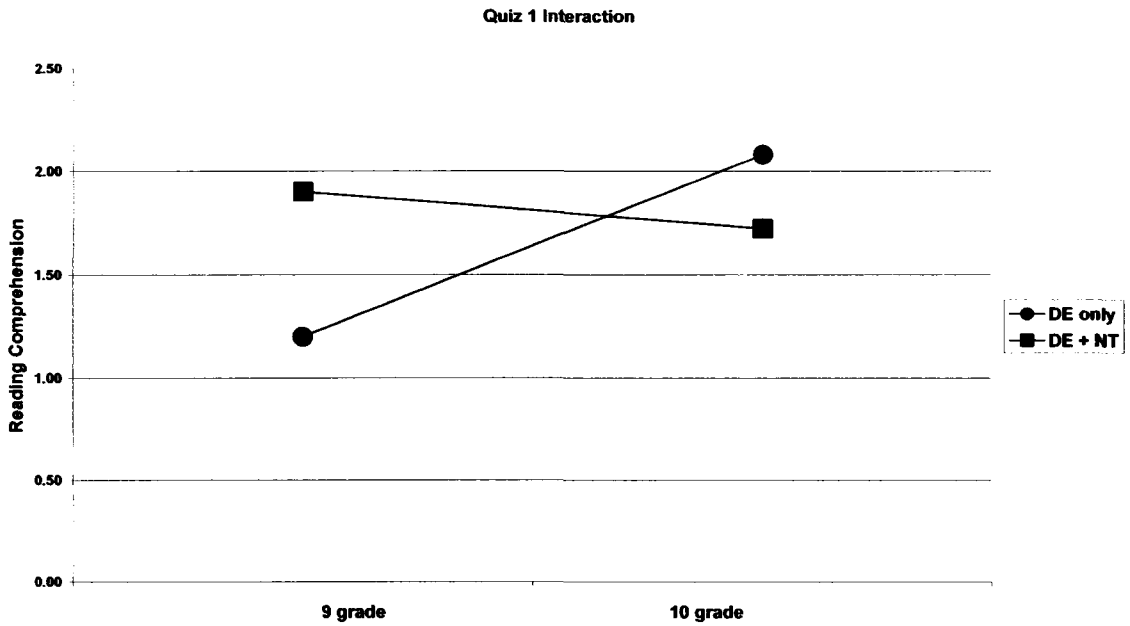
Table 3

Interactions Group x Grade on Quiz 1

Grade/Group	Mean
9 DE	1.20
9 DE+NT	1.90
10 DE	2.08
10 DE+NT	1.72

Figure 1

Interaction Group X Grade on Quiz One



On quiz 1, 9th graders in the DE+NT group significantly outperformed 9th graders in the DE-only group according to post hoc t-tests, $t(48) = -2.50, p < .02$, but the training

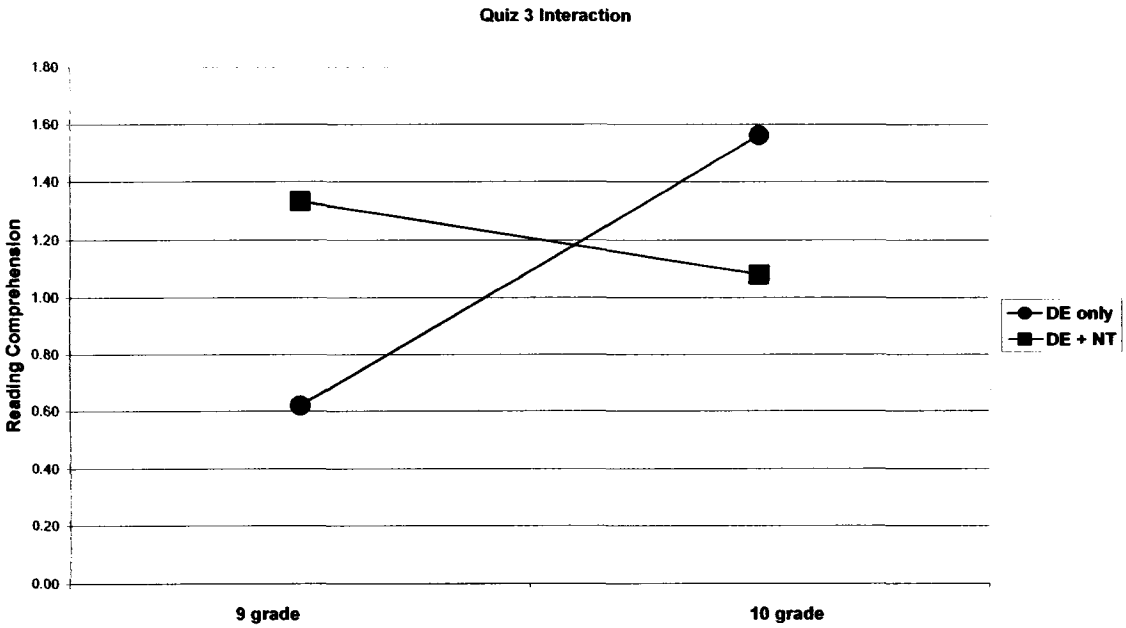
group differences at the 10th grade level missed achieving significance, t (48) = 1.84, p < .07. See Figure 1.

Table 4
Interaction: *Group X Grade on Quiz Three*

Grade/Group	Mean
9 DE	.62
9 DE+NT	1.33
10 DE	1.56
10 DE+NT	1.08

Figure 2

Interaction: Group X Grade on Quiz Three



On quiz 3, the 9th graders in the NT group significantly outperformed the 9th graders in the DE group, t (47) = -3.40, p < .01, but the training group differences at the

10^{th} grade level narrowly missed achieving significance, t (47) = 1.73, $p < .09$. See Figure 2.

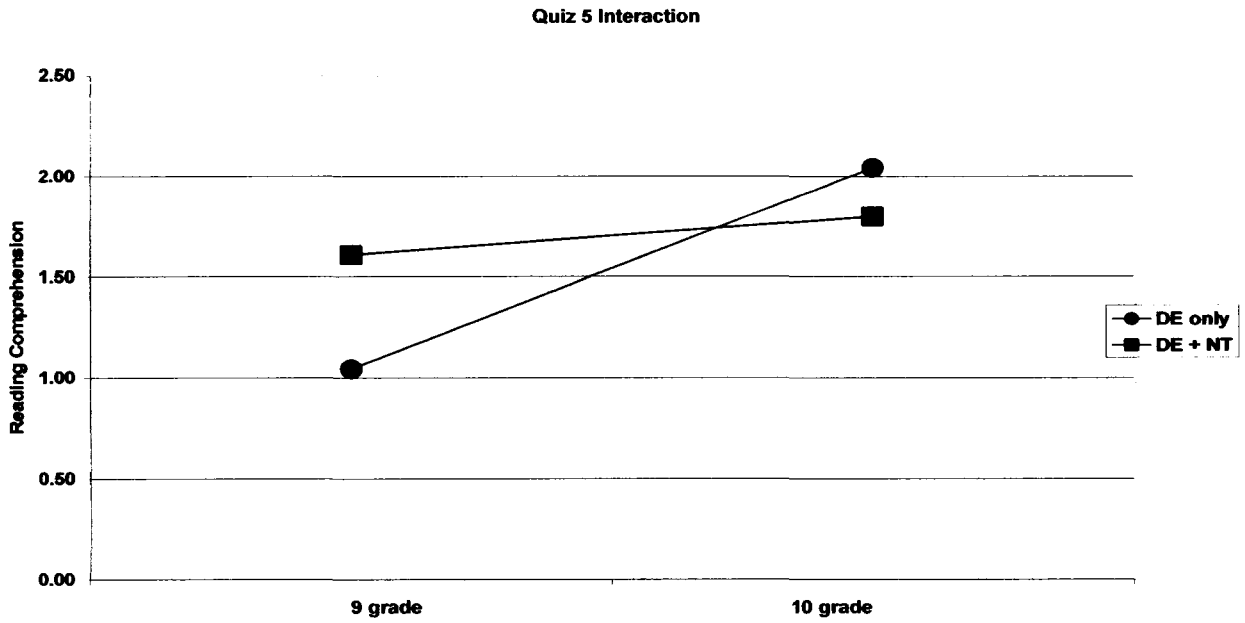
Table 5

Interaction: *Group X Grade on Quiz Five*

Grade/Group	Mean
9 DE	.62
9 DE+NT	1.33
10 DE	1.56
10 DE+NT	1.08

Figure 3

Interaction: Group X Grade on Quiz Five



On Quiz 5 the 9^{th} grade DE+NT students significantly outperformed the 9^{th} grade DE condition and both tenth Grade groups outperformed the 9^{th} t (47) = -3.09 $p < .01$. Differences between the 10^{th} graders were not significant. See Figure 3.

Self-efficacy for quizzes. The self-efficacy for quiz data were analyzed using a 2 (DE-only and DE+NT conditions) X 2 (grade levels) multivariate analysis of covariance with pretest Nelson Denny scores used as a covariate and self-efficacy scores for each quiz as dependent measures. This analysis produced a significant main effect for condition, $F(1, 87) = 4.08$, $p < .05$, a nonsignificant main effect for grade, $F(1, 87) = 2.55$, $p < .11$, and a significant interaction between group and grade, $F(1, 87) = 9.103$, $p < .01$.

A univariate analysis of covariance by condition (DE-only and DE+NT) was performed separately on the five self-efficacy scales for each quiz using the pretest ND as the covariate. These analyses revealed a nonsignificant main effect for condition for SE1, $F(1, 91) = 1.30$, $p < .72$; for SE4, $F(1, 91) = .04$, $p < .84$; and for SE5, $F(1, 94) = 1.37$, $p < .25$; but significant main effects for SE2, $F(1, 90) = 3.88$, $p < .05$ and for SE3 an $F(1, 90) = 5.66$, $p < .02$. None of the grade main effects attained statistical significance. The grade by condition interactions were not significant for SE1, $F(1, 88) = .65$, $p < .42$; for SE2, $F(1, 88) = 2.39$, $p < .13$; and for SE4, $F(1, 88) = .50$, $p < .41$; but the grade X condition interactions were significant for SE3, $F(1, 87) = 3.81$, $p < .05$ and for SE5, $F(1, 88) = 9.96$, $p < .01$. Main effect means are listed below in Table 5. The significant SE3 and SE5 interactions are charted individually in Figures 4, and 5 respectively.

Table 6

Self-Efficacy Scale Means

	Experimental Group		Grade		
	DE-only	DE+NT	9	10	Grand Means
SE 1 M	3.42	3.48	3.38	3.52	3.45

SE 2 M	3.32	3.67	3.32	3.67	3.50
SE 3 M	3.38	3.76	3.50	3.63	3.57
SE 4 M	3.40	3.38	3.26	3.52	3.49
SE 5 M	3.34	3.61	3.39	3.56	3.48

Score = level of Self-Efficacy ranging from a low of 1 to a high of 5.

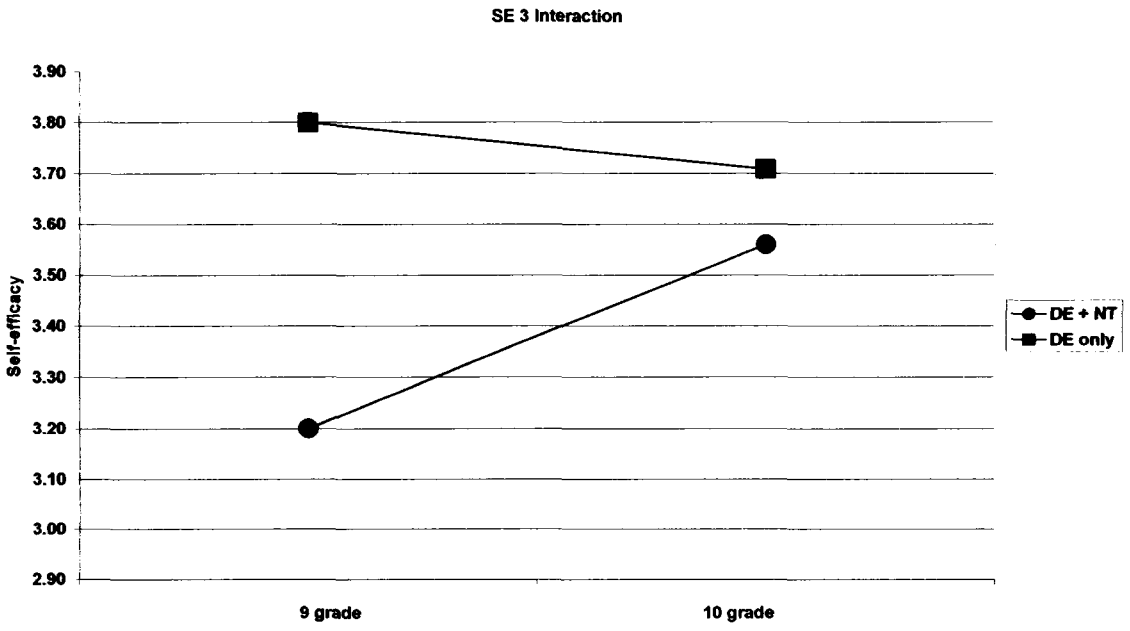
Table 7

Interaction: *Group x Grade on SE3*

Grade/Group	Mean
9 DE	3.04
9 DE+NT	3.60
10 DE	3.56
10 DE+NT	3.71

Figure 4

Group X Grade Interaction on Self-Efficacy for Quiz Three



For SE for quiz 3, the 9th graders in the DE+NT group scored significantly higher than the 9th graders in the DE group, t (47) = 2.27, $p < .03$, but the difference in self-efficacy among 10th graders in two training conditions was not statistically significant, t (47) = -.75, $p < .44$. See Figure 4.

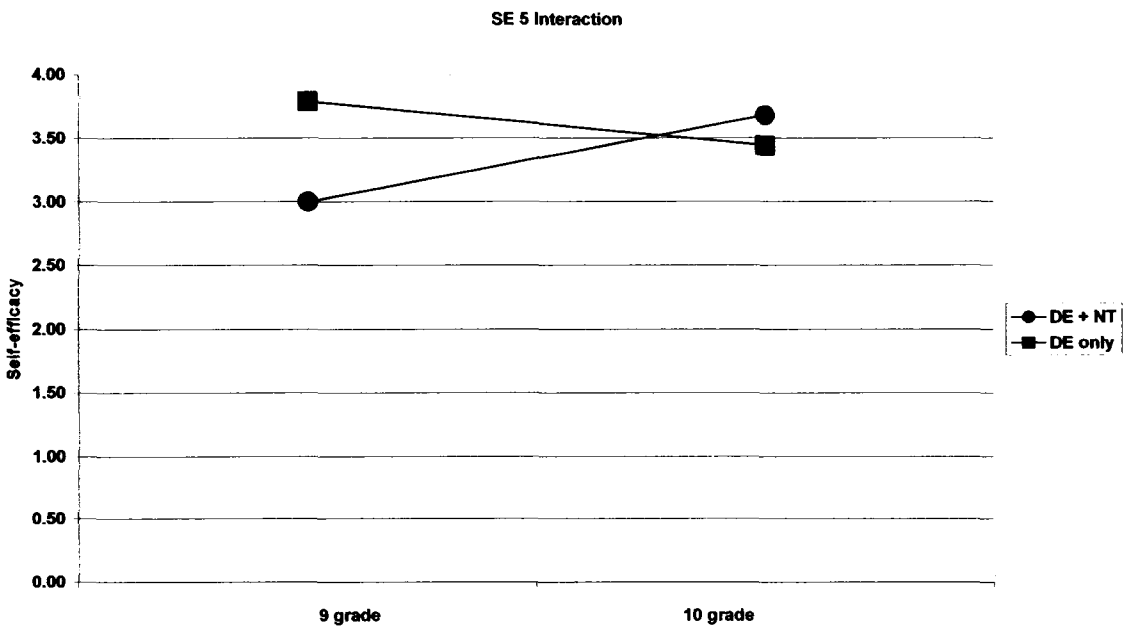
Table 8

Interactions: Group x Grade on SE5

Grade/Group	Mean
9 DE	3.80
9 DE+NT	3.00
10 DE	3.68
10 DE+NT	3.44

Figure 5

Group x Grade Interaction on Self-Efficacy for Quiz Five



On SE for quiz 5, the 9th grade DE+NT students outscored the DE-only students, t (48) = 2.93, $p < .01$ but the differences between the tenth graders in each group were not statistically significant, t (47) = -.42, $p < .68$. See Figure 5.

Table 9

Correlations between Performance and SE

Measure	Correlation	Significance
Quiz1/SE1	-.04	.36
Quiz2/SE2	.10	.16
Quiz3/SE3	.01	.48
Quiz4/SE4	.11	.14
Quiz5/SE5	.26	.01
PostND/PostSE	.44	.01

Correlations between the SE measures and reading comprehension performance are presented in Table 9. Note that the correlations became statistically significant with quiz 5 and the posttest SE scores. Apparently, accurate perceptions of self-efficacy required considerable testing experience.

Treatment Fidelity Observations

The twenty item checklist was scored using a 1 for off-protocol, and a 0 for on-protocol activities. In the twelve observations (two each per condition) conducted by the researcher over the five days of instruction, scores were 0 for each grade and condition. Thus, at no time during the observations were the participants or the instructor off protocol for the condition.

Chapter 5

Discussion

Reading Comprehension Results

Regarding the posttest results, considerable support for the hypothesis that NT training can enhance reading comprehension was found in this study. The multivariate analyses revealed that students who learned, practiced and applied NT summarizations outperformed students in both the DE group and the control group regardless of their grade level. The latter two conditions did not differ significantly according to posttest ND scores. The main effect for grade and the interaction between condition and grade did not prove significant in these analyses of posttest reading comprehension. Thus, teaching high school students with below grade reading levels to summarize and encode into notes their understanding of reading passages enabled them to perform much better on standardized measures of comprehension. NT adds to DE a self-directive tool that provides a permanent record of both strategy application and content that can be used to self-monitor understanding and review for future assessments. There was a medium to large effect size (.122) due to the treatment (Green & Salkind, 2003). This, together with the six month growth in the Nelson Denny grade equivalents, demonstrates that a relatively brief treatment had a substantial effect on high school students' reading comprehension. However, the quiz results revealed a more complex pattern of reading comprehension. The overall multivariate analyses revealed a significant main effect for condition with students in the DE+NT group surpassing those in the DE-only group. Yet, the main effect for grade and grade X condition interaction was significant as well as the main effect for conditions. Overall, the 10^{th} graders outperformed the 9^{th} graders. To

understand the interaction results better, univariate analyses were performed, and they revealed that on three of the practice quizzes (i.e., 1, 3, and 5), the interactions between condition and grade were significant. When examining these three interactions visually and conducting post hoc tests, it was found that DE+NT training was significantly more effective than DE-only training for 9th graders but not for 10th graders. Although the addition of NT was less helpful on some quizzes compared to DE-only training with 10th graders, the numerical advantage of DE-only training was not statistically significant. Thus, DE+NT training did not always enhance reading comprehension on the quizzes, but its superior effectiveness on the posttest ND measure of reading comprehension was not affected by the students' grade levels. On the posttest analyses, there was no main effect for grade level of the students or interaction between their condition and grade level. Clearly DE+NT training effects transferred to the ND posttest performance for students regardless of the students' grade level in school. The ND posttest represents a more comprehensive test of reading skill than the quizzes, which were more closely tied to the instructional episodes.

Why is NT advantageous for poor readers? It has been suggested that at-risk students could profit by emulating the reading strategies of experts. Expert readers automatically summarize concepts and facts as they read (Wyatt, Pressley, El-Dinary, Stein, Evans, and Brown, 1992). Poor readers do not spontaneously display this skill. Duffy's (1984) powerful instructional methodology (DE) provides students with a mastery model (teacher modeling), responsive elaboration on their performance (social feedback unique to the student's performance), and coping models (classmates attempts to apply the newly learned strategy) that facilitate the acquisition of the summarizing

strategy as they read. However, for poor readers, NT reduces that burden on short term memory (STM), which can interfere with text processing (Pressley, 1995). The encoded summary frees the reader's STM to assimilate new information from the ensuing sentences and paragraphs. Additionally, the very act of summarizing forces the student to attend to key ideas and relationships in order to reduce the information from a paragraph into a single sentence. In this study, the teacher emphasized the importance of using self-generated words for the summary, and the establishing personal connections to the text information. Students who are poorer readers were assisted by the application of the summarizing strategy in *both* experimental conditions, however, those who took notes, while slower to acquire the strategy, ultimately performed significantly better on standardized comprehension measures than those who mentally summarized and those who were taught no strategy application at all.

These differences were very clear on the standardized posttest measure of comprehension, the *Nelson Denny.* The differences were less clear on the daily treatment measures where variability among conditions and grades produced less dramatic results. Several explanations are possible. First, the quizzes were not standardized, and thus the difficulty of the items was not closely controlled. Second, although the text passages used on the quizzes had not been covered in course work, the possibility of previous contact with underlying information, especially by the older students, cannot be excluded.

Self-Efficacy Results

The hypothesis that the performance of the students would be mediated by self-efficacy beliefs was not well supported. There were no training condition differences in

self-efficacy that paralleled the ND results, but there was a significant Pearson correlation between self-efficacy and ND performance of .44.

Over the course of the study, students' belief about their efficacy to perform the comprehension task varied very little in mean level, (one exception being the 9th grade DE group on the first quiz, where they had very low SE scores). However, there was a clear, and eventually significant, change in the *accuracy* of the students' self-efficacy expectations regarding their own performance. The correlation for quiz 5 comprehension and SE5 beliefs was statistically significant as was the posttest ND correlation with posttest self-efficacy beliefs. Schunk (1996) believes that it is easier to misjudge self-efficacy in learning settings. Students who are attempting a new task frequently "do not understand the complexity..."of the task (p. 18). It seems that these poor readers are slow to increase their confidence in their reading ability but can learn to be more accurate in their predictions. This raises the question that if students' SE scores are more accurate but are not improved by the five days of strategy instruction, will the students be willing to continue to use the NT and DE strategies on future reading tasks? Further research should address this issue.

Limitations

The generalizability of this research is limited by the fact that only male students were included. However, a greater proportion of males than females are poor readers, (Pressley, 1995), and thus improving the males' functioning represents a particularly demanding challenge. If note taking can improve the comprehension scores of the neediest members of the population, it should have an equally positive effect on the females.

A further limitation may exist because half (75) of the students studied were ninth graders and half (75) were tenth, the additional year of instruction and age may limit the power of the N in the study.

Finally, the daily quizzes that were part of the mastery measure could have had an effect on strategy acquisition because the control students did not take the quizzes. However, Note-takers surpassed the DE-only and the control group, making it unlikely that the quizzes had an effect on the DE-only groups' performance.

Implications

Unfortunately, poor readers seldom receive reading comprehension instruction after the fourth grade, and this limitation represents a major barrier to success in high school and beyond because a major part of secondary school work consists of independent acquisition of information taken from expository texts. There continues to be an implicit belief in the school community that reading comprehension automatically follows once students have learned to decode. This belief prevails despite the fact that high school students fail and drop out at unacceptable rates. Additionally, attempts at remediating the problem are usually limited to short-term "study skills" classes or resource rooms where decontextualized skills and strategies are demonstrated. Skills learned in these settings are expected to be independently transferred from these classes to regular academic courses, a daunting task for skilled readers, never mind struggling ones. To date, the available evidence demonstrates that studies skills classes are not very effective in promoting this transfer. (Pressley, 1995). By contrast, the present research taught reading comprehension strategies within a regular classroom in the context of regular course in global studies.

The present study revealed that a systematic methodology (DE) involving two proven reading strategies (summarizing and summary note-taking) can significantly improve the reading comprehension of these at-risk students. These results provide a strong argument for introducing this approach to high school reading problems into the curriculum.

Although the inclusion of self-efficacy measures in this study met with only limited success, they should be included in future research as well. These measures revealed that these at-risk youngsters had trouble estimating the efficacy of their reading comprehension skill. Fortunately, the accuracy of their judgments improved gradually during training to the point where they became significant predictors of reading comprehension. A myriad of factors may limit teenagers' awareness of their true reading skills. For example, many adolescents with poor skills assume that reading depends on the ability to decode text, and for these youngsters, self-efficacy judgments may imply decoding rather than reading comprehension skill. It seems then that comprehension instruction and self-efficacy for comprehension are linked metacognitively. A person cannot estimate their ability in a given skill if they have little/no awareness of the skill components. Outcomes (grades) are necessary but are not sufficient to produce accurate perceptions of self-efficacy in this age group because high school students are not graded for reading skill but rather on the content area knowledge. Lack of direct instruction coupled with indirect feedback (failing or poor course grades are often the result of poor reading comprehension) seems to produce readers who not only struggle for comprehension but also are unaware of their level of comprehension skills. This is an area that requires much further research.

Conclusion

Being a successful adult in the Information Age requires him or her to be competent in understanding textual information. The urgency to improve the reading comprehension of poorly achieving high school students is heightened by their high levels of drop out. Consequently, it is important to provide their classroom teachers with effective instructional methodologies for teaching reading comprehension, such as DE. The present research revealed that instruction in NT can significantly improve the effectiveness of DE instruction in conveying reading comprehension to these at-risk students. Additionally, and more importantly, NT, when mastered, becomes part of the student's repertoire of self-regulated behaviors that can be effectively applied over a wide range of reading tasks during the students' academic career and beyond.

Appendix "A"

PROTOCOL

For BOTH DE+NT and DE-only **Training Session One**

Reading Skills-discuss the importance or reading in these areas:

1) Classes
2) Homework
3) Regents
4) SATs

Types of Reading-discuss different goals for these tasks:

1) Pleasure reading
2) General information
3) Tests
4) Essays
5) Multiple-choice

Reading Strategies- ways to be more efficient readers i.e., learn more in less time

1) Text analysis
2) Task analysis
3) Summaries

Text Book "World History" page_____.

(Tell students that we are going to focus on reading skills that will improve their scores on class tests, Regents and SATs.)

Text Analysis

1) Examine the page-pictures, headings, graphs, bold vocabulary and pre-questions.
2) Self-question- what do I already know about this
3) Formulate-a pre-reading question
4) Search-for the answer.
5) Summarize-each paragraph

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment
2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.
3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

1) Ask a student to attempt the task with the next paragraph
2) Provide specific, positive and corrective feedback to the student
3) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

1) Distribute SE Scale
2) Explain how to fill it out using assigned numbers only, **no names**.
3) Say: "We are trying to assess your confidence in reading for knowledge."
4) There are three questions on the short quiz you are about to take.
5) Tell them to answer the question:" How sure am I that I will get (1, 2 or all 3 questions right?
6) Choose a number you expect to get and then choose how confident you are in that choice: very unsure, pretty unsure, undecided, pretty sure or very sure.
7) Distribute the quiz. Tell students to read the text and answer the three questions as they attempt to apply the reading skills they are learning.
8) Collect the scales and the quizzes.

DE+NT **Training Session Two**

Quick review:

1) reading skills
2) task analysis
3) text analysis
4) summaries

Note-taking

1) We have already learned the importance of reading with a goal in mind.
2) And we learned to summarize and to answer questions while we read.
3) One way to improve our summarizing and analyzing is to take notes while we read.
4) Notes should only contain important information such as the answer to our question or a short summary of what we read.
5) Things that belong in our summaries:
    a. central idea (headings, charts etc)
    b. places involved
    c. important numbers and names
    d. relationships (cause and effect, groups, conditions)
    e. meaning

Open text books to page _____.

Text Analysis/Teacher Modeling

6) Examine the page-pictures, headings, graphs, bold vocabulary and pre-questions.

Write it on the board

7) Self-question- what do I already know about this

Write it on the board

8) Formulate-a pre-reading question

Write it on the board

9) Search-for the answer.

Write it on the board

10) Summarize-each paragraph

Write it on the board

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment

2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.

3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

1) Ask a student to attempt the task out loud with the next paragraph

2) Provide specific, individual, positive and corrective feedback to the student

3) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

1) Distribute SE Scale

2) Explain how to fill it out using assigned numbers only, no names.

3) Distribute the quiz. Tell students to read the text and answer the three questions as they attempt to apply the note taking and reading skills they are learning.

4) Collect the scales and the quizzes.

DE-NT **Session Three**

Quick review:

1) reading skills
2) task analysis
3) text analysis
4) summaries
5) note taking

- central idea (headings, charts etc)
- important numbers and names
- relationships (cause and effect, groups, conditions)
- meaning

Open text books to page _____.

Text Analysis/Teacher Modeling

1) Examine the page-pictures, headings, graphs, bold vocabulary and pre-questions.

Write it on the board

2) Self-question- what do I already know about this

Write it on the board

3) Formulate-a pre-reading question

Write it on the board

4) Search-for the answer.

Write it on the board

5) Summarize-each paragraph

Write it on the board

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment

2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.

3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

1) Ask a student to attempt the task out loud with the next paragraph

2) Provide specific, positive and corrective feedback to the student

3) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

1) Distribute SE Scale

2) Explain how to fill it out using assigned numbers only, no names.

3) Distribute the quiz. Tell students to read the text and answer the three questions as they attempt to apply the note taking and reading skills they are learning.

4) Collect the scales and the quizzes.

DE+NT Session Four

Quick review:

1) reading skills
2) task analysis
3) text analysis
4) summaries
5) note taking

- central idea (headings, charts etc)
- places involved
- important numbers and names
- relationships (cause and effect, groups, conditions)
- meaning

Open text books to page _____.

Text Analysis/Teacher Modeling

1) Examine the page-pictures, headings, graphs, bold vocabulary and pre-questions.

Write it on the board

2) Self-question- what do I already know about this

Write it on the board

3) Formulate-a pre-reading question

Write it on the board

4) Search-for the answer.

Write it on the board

5) Summarize-each paragraph

Write it on the board

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment

2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.

3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

1) Go around checking student's independent practice.

2) Provide specific, individual, positive and corrective feedback to the student

3) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

1) Distribute SE Scale

2) Explain how to fill it out using assigned numbers only, no names.

3) Distribute the quiz. Tell students to read the text and answer the three questions as they attempt to apply the note taking and reading skills they are learning.

4) Collect the scales and the quizzes.

DE+NT Session Five

Quick review:

1) reading skills
2) task analysis
3) text analysis
4) summaries
5) note taking

- central idea (headings, charts etc)
- places involved
- important numbers and names
- relationships (cause and effect, groups, conditions)
- meaning

Open text books to page _____.

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment
2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.
3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

1) Go around checking student's independent practice.

2) Provide specific, individual, positive and corrective feedback to the student

3) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

1) Distribute SE Scale

2) Explain how to fill it out using assigned numbers only, no names.

3) Distribute the quiz. Tell students to read the text and answer the three questions as they attempt to apply the note taking and reading skills they are learning.

4) Collect the scales and the quizzes

DE-only **Session Two**

Quick review:

1) reading skills
2) task analysis
3) text analysis
4) summaries

Summarizing

Things that belong in our summaries:

f. central idea (headings, charts etc)

g. places involved

h. important numbers and names

i. relationships (cause and effect, groups, conditions)

j. meaning

Text Analysis/Teacher Modeling

11) Examine the page-pictures, headings, graphs, bold vocabulary and pre-questions.

12) Share your thoughts

13) Self-question- what do I already know about this

14) Share your thoughts

15) Formulate-a pre-reading question

16) **Share your thoughts**

17) Search-for the answer.

18) **Share your thoughts**

19) Summarize-each paragraph

20) **Share your thoughts**

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment

2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.

3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

4) Ask a student to attempt the task out loud with the next paragraph

5) Provide specific, positive and corrective feedback to the student

6) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

5) Distribute SE Scale

6) Explain how to fill it out using assigned numbers only, **no names.**

7) Distribute the quiz. Tell students to read the text and answer the three questions as they attempt to apply the note taking and reading skills they are learning.

8) Collect the scales and the quizzes.

DE-only **Session Three**

Quick review:

1) reading skills

2) task analysis

3) text analysis

4) summaries

5) note taking

- central idea (headings, charts etc)
- places involved
- important numbers and names
- relationships (cause and effect, groups, conditions)
- meaning

Open text books to page _____.

Text Analysis/Teacher Modeling

6) Examine the page-pictures, headings, graphs, bold vocabulary and pre-questions.

7) Share your thoughts

8) Self-question- what do I already know about this

9) Share your thoughts

10) Formulate-a pre-reading question

11) Share your thoughts

12) Search-for the answer.

13) **Share your thoughts**

14) Summarize-each paragraph

15) **Share your thoughts**

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment

2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.

3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

4) Ask a student to attempt the task out loud with the next paragraph

5) Provide specific, positive and corrective feedback to the student

6) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

- Distribute SE Scale
- Explain how to fill it out using assigned numbers only, no names.
- Distribute the quiz. Tell students to read the text and answer the three questions as they attempt to apply the note taking and reading skills they are learning. Collect the scales and the quizzes.

DE-only Session Four

Quick review:

6) reading skills

7) task analysis

8) text analysis

9) summaries

- central idea (headings, charts etc)
- places involved
- important numbers and names
- relationships (cause and effect, groups, conditions)
- meaning

Text Analysis/Teacher Modeling

6) Examine the page-pictures, headings, graphs, bold vocabulary and pre-questions.

7) Share your thoughts

8) Self-question- what do I already know about this

9) Share your thoughts

10) Formulate-a pre-reading question

11) Share your thoughts

12) Search-for the answer.

13) Share your thoughts

14) Summarize-each paragraph

15) **Share your thoughts**

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment

2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.

3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

1) Go around checking student's independent practice.

2) Provide specific, positive and corrective feedback to the student

3) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

- Distribute SE Scale
- Explain how to fill it out using assigned numbers only, no names.
- Distribute the quiz. Tell students to read the text and answer the three questions as
- they attempt to apply the note taking and reading skills they are learning.
- Collect the scales and the quizzes.

DE-only **Session Five**

Quick review:

1) reading skills
2) task analysis
3) text analysis
4) summaries

- central idea (headings, charts etc)
- places involved
- important numbers and names
- relationships (cause and effect, groups, conditions)
- meaning

Teacher Modeling

1) Demonstrate-go through the steps outlined above as if it was your assignment
2) Talk-aloud-say exactly what you are thinking as you attempt to analyze the page/paragraph.
3) Step by step-follow the steps above carefully modeling your own application of the reading skills.

Student Practice/Guided Feedback

1) Go around checking student's independent practice.
2) Provide specific, positive and corrective feedback to the student
3) Repeat steps one and two with each student in turn.

Quiz and Self-efficacy Scale

1) Distribute SE Scale

2) Explain how to fill it out using assigned numbers only, no names.

3) Distribute the quiz. Tell students to read the text and answer the three questions as they attempt to apply the note taking and reading skills they are learning.

4) Collect the scales and the quizzes

Self-Efficacy Session #

1. How sure am I that I will get all three questions right?

(Circle your choice)

1 = very unsure

2 = pretty unsure

3 = don't know

4 = pretty sure

5 = very sure

Observation for Treatment Fidelity

Treatment Protocol	Observation 1	Observation 2
Teacher discussing Reading in General		
Teacher discussing Reading Strategies in General		
Teacher Modeling of Strategies		
Students Reading Text		
Teacher Modeling Note taking		
Teacher Writing Summary on Board		
Teacher Modeling Text Analysis		
Teacher Modeling Note Taking Summarization		
Teacher Modeling of Mental Summarization Strategy		
Students Guided Practice Verbal Summary		
Students Guided Practice Note-taking Summary		
SE Scale		
Quiz		
Students Covert Practice of Verbal Summarization		
Students Covert Practice of Note-taking Summarization		
SE Scale		
Individual Feedback		
Teacher Lecturing		
Students in-seat Assignment		

Check if on Protocol.

Record below any off protocol behaviors

1.____

2.____

3.____

4.____

5.____

6.____

7.____

8.____

9.____

10.___

Total for Observation_____

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