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By the time young adults reach college environments, they are expected to actively engage with text in order to obtain meaning from text. As Brown and Campione (1990) indicated, the demands of a technologically advanced society require "complex forms of literacy" (p. 108) and that among other skills, educated individuals must be able to read critically and to clearly articulate in both written and oral language.

Success in college depends on a certain sophistication of reading and writing skill, however, between 30 and 40 percent of first-year college students have deficiencies in reading and writing skills for college performance (Moore and Carpenter, 1985). Furthermore, changes in demographics and open-admission policies have resulted in colleges admitting large numbers of first-year students who are considered at-risk for completing their programs (Hodge, 1991). Instructional support for such students is critical and this need will continue until well into the next century (Wyatt, 1992).

In assisting first year college students with the demands of college reading and writing, educators should consider the potential power of metacognitive skill instruction.
Metacognition, loosely defined as "thinking about thinking," has witnessed a recent surge of interest. Flavell (1993) defined metacognition as "... knowledge or cognitive activity that takes as its object or regulates any aspect of the cognitive enterprise" (p. 150). As such metacognition has come to be defined as the awareness and regulation of cognitive activity (Baker and Brown, 1984; Flavell, 1976; Flavell, 1978; Flavell, 1993; Flavell and Wellman, 1977). It is a construct that has broad applicability within educational contexts (Flavell, 1993). In particular, metacognition has become a defining characteristic of an active learner who exercises control over the learning process (Mayo, 1993).

Recently Brozo and Simpson (1995) identified metacognitive awareness as characteristic of an active reader. Active readers activate prior knowledge to facilitate comprehension, are sensitive to how ideas are organized in text through understanding text structure, elaborate on information presented in text, and use metacognitive awareness to orchestrate all these processes (Brozo and Simpson, 1995). Others have also argued that metacognitive skill is central to effective reading (Baker and Brown, 1984; Hare and Pulliam, 1980; Paris, Wasik and Turner, 1991; Mealey and Nist, 1989).

Metacognitive awareness has also been identified as characteristic of an effective writer. Englert, Raphael, Fear and Anderson (1988) studied the metacognitive knowledge learning disabled and non-learning disabled children have about writing. They found evidence to suggest that learning disabled children do lack the metacognitive knowledge needed to regulate that writing process and that specific metacognitive behaviors correlated with writing performance. Raphael, Englert and Kirscher (1989), who studied fifth and sixth graders' metacognitive knowledge about writing as a function of types of writing instruction, found that metacognitive
awareness could be increased through instruction and that this increase in metacognitive knowledge contributed to writing performance.

In light of such recent scholarship, it follows that instruction in metacognitive development can assist students with the reading and writing skills necessary for independent learning in college. Evidence suggests that first-year college students have limited metacognitive skill. Simpson (1984) and Simpson and Nist (1990) reported that first-year college students have limited repertoires for interacting with text. Instructional programs which enhance metacognitive awareness could benefit this population.

Within this study, first-year university students who enrolled in a pre-college summer program received instruction in metacognitive skill development that promoted an increase in metacognitive awareness for both reading and writing. Metacognitive awareness was measured by two questionnaires which will be described below. Results indicated that instruction in metacognitive skill development can increase metacognitive awareness for both reading and writing for this population.

**Method**

**Participants.** Participants were volunteers from a six-week summer residential academic program for first-year students from a major northern university. Students participated prior to their first-year at the university. This program targets students from underrepresented populations who show academic potential but who can also benefit from intensive instruction in reading, writing, math, and study skills.

Students enrolled in a required course on reading and writing. The students who enrolled in four sections of this
course received the metacognitive instruction (N=43). Among the 43 participants (27 female, 16 male) the mean age was 17.58 with a standard deviation of .55. The majority of the students were African-American (72.09%) while a minority were Hispanic (11.63%), White (11.63%), and Asian or Indian (4.65%). Before starting the program, students were tested on the Nelson-Denny Reading Test (Form E) (Brown, Bennett and Hanna, 1981). The mean pre-test percentile score on the comprehension sub-test of the Nelson-Denny Reading Test for the study participants was 37.67 (SD = 27.87) and the post-test percentile score on the comprehension sub-test of the Nelson-Denny Reading Test was 54.91 (SD = 28.01).

Procedure

Metacognitive skill instruction. In order to organize the metacognitive instruction for these learners, a model was developed by integrating the scholarship on metacognition as it relates to reading (Baker and Brown, 1984; Paris et al., 1991) with scholarship on metacognition as it relates to writing (Englert et al., 1988; Raphael et al., 1989). The work of Hayes and Flower (1987) on the writing process and the work of Tierney and Pearson (1983) on the integration of reading and writing also contributed to the thinking behind this model.

The model is represented by Figure 1 below. One assumption of this model is that reading and writing are interactive processes linked to one another. Reading lends itself to writing and writing lends itself to reading as is illustrated by Figure 1. Another assumption is that both reading and writing are processes which involve three recursive phases: a planning phase (before reading or writing), a drafting phase (during reading or writing), and a responding phase (after reading and writing). Conceiving of reading and writing as these phases was justified by integrating the work of Paris et
al. (1991) with the model of the composing process set forth by Hayes and Flower (1987).

During the six weeks, students were taught specific metacognitive strategies that corresponded to each of the phases of reading and writing. As Figure 1 illustrates, the metacognitive strategies associated with each of the three phases for reading and writing are quite parallel. Students were taught that planning for reading involves identifying a purpose, activating prior knowledge, previewing text, and making predictions about the text.
According to Baker and Brown (1984) effective readers engage in self-questioning and comprehension monitoring to keep track of their success in understanding the text. The students were taught self-questioning and comprehension monitoring as metacognitive strategies associated with the drafting phase of reading. For the third phase of reading, responding, the students were taught to evaluate their understanding of the text, to react to the text, and to relate the text to prior experience. Again, these specific strategies are consistent with descriptions of metacognitive activity advanced by Baker and Brown (1984) and Paris et al. (1991).

Figure 1 shows that the metacognitive strategies for writing parallel the metacognitive strategies for reading. Planning for writing involves the metacognitive strategies of identifying a purpose for writing, activating prior knowledge, and organizing ideas. Hayes and Flower (1987) maintained that writing is goal-directed and necessitates the retrieval of topic knowledge. Raphael et al. (1989) also identified setting a purpose as a fundamental metacognitive activity associated with writing.

During the drafting phase of writing, learners conduct self-questioning of their own texts and monitor their success at completing the writing task. Englert et al. (1988) suggested that self-regulating and monitoring a paper's completion during writing is as important as the monitoring process associated with reading comprehension. Self-questioning assists the monitoring process of writing. Hayes and Flower (1987) identified monitoring and directing one's own writing process as part of the problem solving necessary for effective writing.

During the responding phase of writing, learners evaluate their success at the writing task, react to their texts as
readers, and examine their texts holistically in order to see connections among different parts of their text. Englert et al. (1988) identified self-evaluation of a paper's completeness as an important metacognitive activity for writing. By reacting to their own texts as readers, they are better able to evaluate their texts for completeness. Examination and awareness of text structure or relations among segments of a text is also important for success in writing (Englert et al., 1988; Raphael et al., 1989).

In addition to the specific strategies, two other essential components are the awareness and regulation of strategy use. Within the model, awareness and regulation are represented as thought processes which are used in conjunction with any and all strategies presented. For example, while students were taught how to identify a purpose for reading, they were also taught that they need to be aware of activating this strategy and to regulate its use (e.g., decide when and why this strategy is appropriate). Similarly, students were taught not only how to mark text which supports the monitoring strategy, but to identify when marking text is appropriate and to regulate their use of the strategy according to the reading situation.

Another important component of metacognitive instruction which was taught in conjunction with the responding phase of reading and writing is increasing learners' sensitivity to text structure. Baker and Brown (1984) in describing metacognition and its relation to reading identified the importance of self-awareness of cognitive processes while reading. One element the reader should be aware of is text construction (Baker and Brown, 1984, p. 376). Englert et al. (1988) also suggested that knowledge of text structure informs the learner's decision-making process during the process of either comprehending or producing expository text. Within this
study, teaching students to be aware of text structure and organization was part of the metacognitive skill instruction.

Assessment of metacognitive awareness for reading

A 36-item questionnaire was used to assess participants' metacognitive awareness for reading. Scenarios were used that corresponded to the three phases of reading. The first scenario introduced "Vicki," a college student faced with a difficult essay to read. The intent of this scenario was to elicit responses from students about strategies they may or may not use before they read a passage. The prompt was as follows:

Vickie is a college student who is taking a class in English. Her professor often gives the students essays to read. The essays are by well-known authors and are about different topics. The next page has the first two pages of an essay the professor has given the students to read. Think about what you typically do before you start to read something for a class. Then answer the following questions.

Participants responded to the prompt, "if you were in this situation would you..." for nine specific activities. Six of the activities represented strategic behavior, and three represented non-strategic behavior. For each activity the participants checked either "yes" or "no" for that activity. For example, in response to the scenario based on the planning phase of reading, the participants responded to the following nine activities: 1) think about why you are reading; 2) write down a reason for doing the reading; 3) just start reading; 4) think about what you already know about the topic; 5) read over the title, headings, author or anything else that stands out; 6) make notes about what you think the author is going to say; 7) count the number of pages; 8) memorize the title; 9)
think of something from your experience that relates to the topic.

Each of the nine responses that followed a scenario was considered either strategic or non-strategic. For example, activities 1, 2, 4, 5, 6, and 9 were considered strategic, while activities 3, 7, and 8 were considered non-strategic.

After responding to each of the nine activities, participants were asked to respond to the following open-ended question: "Are there any other things that you would do? If so, write them down below." This question was designed to identify any metacognitive strategies the participants may use which were not part of the initial nine responses.

The remainder of the questionnaire for metacognitive knowledge for reading followed the same format. Each scenario represented a specific component of the reading/writing process model and was followed by nine activities to which the participants responded with either "yes" or "no." Participants then responded to the open-ended prompt by writing down any other strategies or thought processes they would engage in if they were in the same situation.

The second and third scenarios described Vickie's situation as she read the passage and discovered that it was difficult for her. These scenarios were designed to assess the learners' thought processes during the drafting phase of reading. The fourth scenario was designed to assess learners' thought process for the responding phase of reading.

Assessment of metacognitive awareness for writing

The questionnaire for metacognitive knowledge of writing represented the situation of "Joel," a student faced with the task of writing a short paper. It was parallel in format to
the questionnaire for metacognitive knowledge for reading in that it was comprised of four scenarios which corresponded to the phases of writing outlined in the model illustrated by Figure 1. The first scenario was designed to assess learners' use of metacognitive strategies before they engage in a writing task. Participants responded to the following prompt:

*Joel is a college student who is taking a writing course. His writing instructor told him to write a short paper on any topic he liked. Joel decided to write about rock music. He has a problem, however. He can't seem to get started. Think about what you do before you start to write.*

Just as they did for the questionnaire of metacognitive knowledge for reading, participants responded to the prompt, "If you were in this situation would you ..." for nine specific activities. Six of the activities represented strategic behavior and three represented non-strategic behavior.

For each activity the participants checked either "yes" or "no" for that activity. In response to the scenario based on the planning phase of writing the participants responded to the following nine activities: 1) talk about your ideas with a friend; 2) think about why you are writing the paper; 3) just start writing; 4) jot some thoughts on paper; 5) talk to a friend about rock music; 6) think about what you already know about rock music; 7) write your name on your paper; 8) go find a dictionary; 9) draw a diagram of the types of rock music.

For this scenario, activities 1, 2, 4, 5, 6, and 9 were considered strategic, while activities 3, 7, and 8 were considered non-strategic. After responding to each of the nine activities, participants then responded to an open-ended question asking them about anything else they would do.
The remainder of the questionnaire for metacognitive knowledge for writing followed the same format as that for reading. However, it differed from the questionnaire of metacognitive knowledge for reading by providing successive portions of Joel's paper in the second, third, and fourth scenarios. The first scenario was designed to assess the learners' thought processes during the drafting phase of writing; and the fourth scenario was designed to assess learners' thought processes for the responding phase of writing.

Scoring procedures for questionnaires of metacognitive knowledge

Scoring of the metacognitive questionnaire accounted for levels of strategic activity. A "yes" response to a strategic activity was scored as a 1, and a "yes" response to a non-strategic activity was scored as a 0. A "no" response to a strategic activity was scored as a 0, and a "no" response to a non-strategic activity was scored as a 1. For each questionnaire, the scores on all the items were added to provide an overall score of metacognitive knowledge for reading and an overall score of metacognitive knowledge for writing.

These definitions of strategic and non-strategic were also used to score the open-ended responses for each scenario. Two researchers using the same definitions of strategic and non-strategic scored the open-ended responses. Inter-rater reliability was accounted for in two ways: the extent to which the raters agreed that the behaviors elicited by each open-ended response could be selected for classification as either strategic or non-strategic, and the extent to which the raters were in agreement about whether each reported behavior was strategic or non-strategic. After working through approximately 16% of the overall open-ended responses, the raters achieved 88% agreement for mutually identifying an open-ended response in the same way, and 93% agreement for
identifying each behavior reported as either strategic or non-strategic.

Each open-ended response was scored according to the rubric and this score was added to the score for each scenario. The scores for each reading scenario were totaled, generating a total metacognitive score for reading. The questionnaire of metacognitive knowledge for writing was scored in a similar manner. Consequently, each participant had a total metacognitive knowledge score for reading and a total metacognitive knowledge score for writing.

Results

Correlated *t*-test procedures were used to determine if training in metacognitive skill development made a difference in participants' metacognitive questionnaire scores for reading and writing. The post-test metacognitive knowledge for reading score ($M = 26.50, SD = 5.27$) was significantly higher than the participants' pre-test metacognitive knowledge for reading score. ($M = 21.63, SD = 6.20), \( t(41) = 5.74, p = .000001 \). A one-way repeated measures analysis of variance was conducted to reveal a coefficient of determination of .45 which accounts for 45 percent of the variance. This result provides evidence that the metacognitive instruction did heighten metacognitive awareness for these students.

A correlated *t*-test procedure was used to determine if training in metacognitive skill development could also make a difference in metacognitive knowledge for writing. The post-test metacognitive knowledge for writing score ($M = 29.71, SD = 4.40$) was significantly higher than the pre-test metacognitive knowledge for writing score ($M = 27.28, SD = 4.93, t(41) = 3.45, p = .001$. A one-way repeated measures analysis of variance was conducted to reveal a coefficient of determination of .22 which accounts for 22 percent of the variance.
This result provides evidence that for this population of learners, metacognitive awareness for writing was also enhanced.

**Discussion**

This study provides evidence that metacognitive awareness for both reading and writing can be enhanced through direct instruction for this population of learners. Findings suggest that metacognitive awareness can be taught, an idea suggested by Baker and Brown (1984) and Armbruster, Echols, and Brown (1982). Other research also supports this notion. In working with underprepared college learners in a reading and study skills course, Shenkman and Cukras (1986), compared the effectiveness of overt metacognitive strategy instruction, separate skills instruction, and the absence of comprehension instruction.

The two treatments did not differ in the actual comprehension strategies taught; however, learners in the metacognitive strategy group received instruction in four metacognitive "macrostrategies" which stressed the importance of strategic planning, self-regulation, and evaluation of the use of strategies. The authors found that the metacognitive instruction promoted a significantly greater increase in metacognitive awareness among the learners than did the separate skills instruction. They concluded that separate skills training in the absence of metacognitive training is not sufficient to provide such learners with the necessary control over the entire process of gaining meaning from text.

Metacognitive skill is at the heart of learners who are actively engaged and in control of their own learning. Hodge, Palmer, and Scott (1992) provided metacognitive instruction in the form of reciprocal teaching in cooperative groups to at-risk college students. Basing their work on Palinscar and
Brown's (1982) notion of reciprocal teaching, Hodge, Palmer, and Scott (1992) found that metacognitive training through reciprocal teaching contributed to an increase in reading comprehension as measured by the Nelson Denny Test. They concluded that the training in metacognition helped the students to become more actively engaged with text.

Attention to developing metacognitive awareness on the part of college learners is also in keeping with the more current cognitive view of reading comprehension (Dole, Duffy, Roehler, and Pearson, 1991). As opposed to the traditional behavioral view of reading comprehension instruction, the cognitive view advocates teaching comprehension strategies in conjunction with metacognitive awareness so that readers learn to exercise control over the reading process and can knowingly employ a variety of strategies in order to make sense of any text (Dole et al., 1991).

Teaching metacognitive skill in conjunction with both reading and writing processes is also consistent with a recent focus on the interfacing of theories of reading with theories of writing (Harris and Sipay, 1990). This integrated notion of reading and writing has recently been advocated by Brozo and Simpson (1995) who described reading and writing as "parallel processes" by which students construct meaning from text (p. 203). They appealed to notions developed by Tierney and Shanahan (1991) who described reading and writing as companion processes which share specific underlying activities such as goal setting, self-correction, and self-assessment.

The interfacing of reading and writing and the emphasis on metacognition suggests a more integrative approach to literacy instruction. Such an integrative approach to literacy instruction has yet to take hold within college environments. Sadly, much of the instruction used to support college
learners is characterized by isolated skills instruction (Applegate, Quinn, and Applegate, 1994; Hodge et al., 1992), in which students are taught a number of skills and subskills in isolation without attending to the metacognitive activity which allows the learner to control and master the learning process.

There is reason to believe that more integrative approaches to literacy instruction which stress metacognitive awareness may benefit college learners seeking to improve their reading and writing skills. Such an approach, which promotes active processing of text is more in keeping with the demands placed on college students. Instructional programs targeted toward assisting college students with reading and writing proficiency would be improved by attending to metacognitive skill development for these learners.

References


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