
**CRITICAL READING
CAN IT BE IMPROVED THROUGH THE USE OF
METACOGNITIVE STRATEGIES?**

JACKIE PARSON

Louisiana State University

The ability to critically analyze written materials has long been recognized as being crucial to the educational process. Building on Dewey's (1910) conception of reflective thinking, and using Bloom's (1956) and Barrett's (Barrett & Smith, 1976) taxonomies for classification of educational objectives has allowed researchers to formulate a more precise image of the concept 'critical reading'. Critical reading involves the ability to evaluate information and draw objective and logical conclusions (Dejnozka & Kapen, 1982), it is personal and allows for different opinions and judgments (Wardeberg, 1967).

During the 1950's and 1960's, many studies which delved into more traditional ways to teach critical reading were conducted. Researchers attempted to design specific instructional units to increase critical reading ability (Maney, 1958; Mason, 1963; Nardelli, 1957; Sochor, 1958; Struthers, 1969; Wolf, King & Huck, 1968). Many of these instructional procedures appeared, on the surface, to have been effective. However, little evidence can be found, in research, of any long lasting effects.

The failure of many of these training studies to bring about an increase in the use of critical thinking and other intellectual strategies indicated a need for a new perspective on the problem. Metacognitive strategies, developed through a fusion of ideas from both educators and cognitive psychologists, could provide the heretofore missing link between cognitive processes and critical reading ability. Metacognition refers to one's awareness of and control over his/her own mental processes (Brown, 1980). Research is now guided by cognitive

theories which draw support from a wide theoretical base and which cut across many academic domains. Barriers between learning theorists and cognitive developmental theorists are disappearing (Brown & Bransford, 1982). While past studies looked at only the product of experimental procedures, present day researchers are analyzing the intellectual processes as well.

Accepting the premise that use of metacognitive strategies and comprehension ability are related, researchers and practitioners have begun to develop instructional procedures which will increase the likelihood that students will employ such strategies. If, as many researchers propose (Worden, 1981; Brown, 1980), critical reading should be considered as an extension of the overall comprehension process rather than as a set of distinct sub-skills, a relationship between critical reading ability and metacognitive awareness can be drawn.

This study was designed to determine the effectiveness of a metacognitive strategy training package specifically developed to increase critical reading ability. Students who are instructed with this training package should become more aware of their own mental processes. They should know when comprehension problems occur and should have strategies available to remedy these difficulties. These strategies, when appropriately selected and used, should increase the probability that the students will critically analyze written materials presented to them and, in addition, should increase general comprehension ability.

The major purpose of this study was to test the strength of the relationship between the use of metacognitive strategies and critical reading ability. It was conducted, specifically, to test the effectiveness of a teaching procedure designed to improve critical reading ability by training students in metacognitive strategies. The hypothesis of this study was that the students who received the metacognitive training would demonstrate not only increased critical reading ability, but also increased general comprehension ability.

This preliminary study was designed to determine if future research, with larger numbers of students, was warranted and to test the effectiveness of experimental procedures and materials.

Subjects

Fifteen students enrolled in a Developmental Reading Laboratory served as subjects for this preliminary study. Students reading below grade level were selected to test the effectiveness of this metacognitive training package because research has indicated that such students often are not spontaneously using metacognitive strategies and would probably benefit from this type of instruction (Baker & Brown, 1980; Goetz, Palmer & Haensley, 1983; Paris & Myers, 1981; Pitts, 1983). These students were randomly assigned to one of three groups: Experimental Group 1, Experimental Group 2, and Control Group. There were five subjects in each group.

Materials

After a thorough search of researcher-designed tests (Struthers, 1969; Taba, Levine & Elzey, 1964; Wolf, et al, 1968; Worden, 1981), the Intermediate Level of the Ohio State University Critical Reading Test (Wolf et al, 1968) was chosen as a test of critical reading ability. This test was chosen because

it included appropriate skills and because test items were well written and seemed to tap critical reading ability. Since there was only one form of the test, odd numbered items were used as a pre-test and even numbered items as a post-test. Passages and their accompanying questions were selected from commercial materials used in the Reading Lab to serve as general comprehension probes. Test passages used in experimental treatments were also copied from commercial materials used in the Reading Lab.

Procedures

The duration of this study was three weeks. Treatments lasted approximately thirty minutes each day. Following is a discussion of experimental procedures used with each group.

Experimental Group 1

Experimental Group 1 was instructed with the metacognitive strategy training package which included two phases. During Strategy Training (Phase 1), subjects were instructed in the use of four strategies (questioning, summarizing, predicting, and speculating on the author's intended tone or purpose). During a second phase called Corrective Feedback Training, subjects participated in an adaptation of the Reciprocal Teaching Procedures developed by Palincsar and Brown (Palincsar, 1984; Palincsar & Brown, 1983, 1984). Working in groups of five, members took turns being 'group leader'. Using presented text passages, the 'leader' discussed his/her use of the strategies following a prescribed sequence and invited active participation of other group members as he/she critically analyzed the passage. The researcher remained a group member and provided modeling, probing, and prompting whenever necessary.

Experimental Group 2

Experimental Group 2 subjects were taught through the use of an instructional package referred to as a Passive Written Procedure. Subjects were taught the same four strategies but were given written rather than oral instructions. Minimum teacher explanation was provided and there was no opportunity for group oral interaction. During Phase 2, these subjects were asked to complete a written worksheet which required them to use the strategies while critically analyzing the same text passages as those used by Group 1 during Corrective Feedback Training.

The major differences between the two experimental groups concerned not only the method of instruction (written versus oral) but also the presence of a metacognitive element. Subjects in the second experimental group were less likely to be cognizant of their own mental activities since they had not been provided with the corrective feedback which should facilitate the monitoring of such processes.

Control Group

The control group only received the pre- and post-tests (on the same days as the experimental groups). During the remaining days, they participated in regular Reading Lab instruction.

Results

Data obtained from this study was quantitatively analyzed

using an Analysis of Covariance and qualitatively analyzed through informal observations and discussions. The results are discussed below.

Quantitative Analysis of Data

An Analysis of Covariance was performed on both the critical reading and the comprehension tests to analyze variance between and within groups. Method of instruction, as determined by group membership, was the independent variable. Post-test scores were used as dependent variables and pre-test scores as covariates.

Test scores indicated that experimental procedures did not significantly affect performance on the critical reading tests at the .05 level of significance, $F(2, 10) = 3.41$ (See Table 1). Comprehension test scores also indicated a non-significant difference in group scores $F(2, 10) = 1.45$ (See Table 2).

Informal Observations

Informal observations revealed that subjects in Experimental Group 1 seemed to have improved not only in their use of instructed strategies, but also in their attitude toward reading. Such improvements were not noted with Experimental Group 2 subjects.

Experimental Group 1 subjects appeared to improve in their use of the instructed strategies. The ability to formulate good comprehension questions gradually improved throughout this three week session. Initially, subjects had problems not only with picking out important information about which to ask questions, but also in the actual wording or formulation of the questions. As students became more proficient at choosing main ideas and topic sentences, they not only improved in their ability to summarize, but also improved in their question formulating ability. Gradually, less important ideas and trivial details were deleted from both summaries and questions.

The skill of predicting should have allowed students to get a 'mind-set' for what a passage would be about. During the Corrective Feedback phase, subjects began to use such predictions to mentally recall their background experiences and prior knowledge about a particular subject. Building upon this knowledge, they admitted, increased their understanding of the passages.

Speculating on the author's intended tone or purpose proved to be a very effective, stimulating activity. Students initially had a difficult time reacting to the text but, as they became more involved in the oral interaction and more self confident about their own strengths, they improved in their ability to more intelligently discuss such things as propaganda techniques, emotional tone, and author's true intentions. They were able to compare and/or contrast their own feelings and opinions to those of the author.

While the actual strategy instruction was an important and critical first stage, the continuing 'instruction' that occurred during the Corrective Feedback stage (when they were encouraged to interact orally) was even more important to the developing critical reading and metacognitive abilities. At first, the researcher did most of the talking, but gradually the students 'took over'. An important point is that the students appeared to recognize the interrelatedness of these strategies as evidenced by their ability to use one or all of them as the necessity arose. This would seem to indicate that strategies

had been internalized. Even though these students were labeled as 'poor readers', many creative ideas were presented and intelligently discussed and analyzed.

An informal evaluation of the students' perception of this instructional procedure revealed many positive attitudes. All five students in this group felt that the strategies they had learned would be very useful in future college courses. They could even give specific examples of how they were already using these strategies in other courses they were taking.

Discussion and Conclusions

Despite the apparent success of training procedures (as perceived by both the researcher and the subjects), statistical analysis revealed that the metacognitive critical strategy training employed in this study did not produce significant gains in achievement on either critical reading or general comprehension tests. A carefully analysis of procedures and materials employed in this exploratory study enabled the researcher to speculate upon reasons for the lack of statistically significant results and to recommend modifications for use in future studies.

A possible problem could have been the tests. The critical reading test was too short; critical skills were not equally divided between pre- and post-tests. The comprehension tests were not of sufficient difficulty and, consequently, did not produce adequate variance between the groups for either the pre or the post-test. This could possibly have masked treatment effects which might have otherwise surfaced. The possibility also exists that the subjects had successfully learned and internalized instructed strategies but that these tests did not adequately measure such improvement. Testing instruments and procedures should be closely scrutinized and appropriately adapted before future studies are implemented.

Informal discussions and observations of strategy use indicated the success of this procedure; however, statistical data failed to reveal significant results. Because of this disparity, a third phase for Experimental Group 1 (in addition to Strategy Training and Corrective Feedback Training) which would allow for additional practice of instructed strategies by pairing subjects and allowing them to 'critically discuss' selected newspaper articles will be included. This might increase chances that the subjects will apply learned strategies in a testing situation and that they will use them in their daily lives.

The small group size could also have been responsible for the lack of significant results. Increasing the number of involved subjects, should increase chances of finding treatment effects.

A different statistical procedure than the one employed here is recommended for future studies. Rather than an Analysis of Covariance, a Repeated Measures Analysis should allow for a variety of comparisons.

Although statistical analysis failed to reveal the effectiveness of this training procedure, its potential for increasing critical reading ability should not be dismissed. Qualitative improvements noted in subjects' strategy use provided sufficient evidence for further study into the effectiveness of this training procedure.

TABLE 1
CRITICAL READING TESTS

Descriptive Statistics				
Pre-Test				
Group	n	x	SD	
Exp. 1	5	68.00	8.37	
Exp. 2	5	70.00	9.35	
Control	4	80.00	7.07	
Total	14	72.67	9.35	
Post-Test				
Group	n	x	SD	
Exp. 1	5	68.00	14.40	
Exp. 2	5	59.00	16.73	
Control	4	63.75	7.50	
Total	14	63.57	13.36	

Ancova Table

Source	SS	df	MS	F
Between	393.76	2	196.88	3.41
Within	577.51	10	57.75	
Total	1135.71	13	87.36	

TABLE 2
COMPREHENSION TESTS

Descriptive Statistics				
Pre-Test				
Group	n	x	SD	
Exp. 1	5	93.80	4.09	
Exp. 2	5	85.80	12.87	
Control	4	93.00	4.24	
Total	14	90.09	8.65	
Post-Test				
Group	n	x	SD	
Exp. 1	5	92.60	3.78	
Exp. 2	5	84.00	11.85	
Control	4	95.75	6.65	
Total	14	93.00	4.24	

Ancova Table

Source	SS	df	MS	F
Between	72.20	2	36.10	1.45
Within	249.29	10	24.93	
Total	1095.43	13	84.26	

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