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ABSTRACT

A pilot study assessed the effects of training in self-awareness and self-regulation on the reading comprehension of students in a postsecondary occupational training program. Subjects, 11 students enrolled in a community college technical training program in welding, were given training sessions that provided practice in metacognitive methods through reciprocal teaching and four comprehension monitoring/regulating techniques--self-questioning, summarizing, predicting, and critical evaluation of text. During each intervention session, they were required to read a 1,000- to 1,500-word passage of expository technical prose. At the end of each session, subjects answered evaluation questions on a different 500-word passage of similar readability in another technical content area. Both a pretest and posttest were administered. The pretest mean ranked the group in the lowest three percent of college freshman, but the posttest mean was nearly double the pretest mean, placing the group in the lower quartile. Findings suggest that, although substantial growth in achievement was indicated, lack of a control group left no basis for comparison. Findings also suggest that the average achievement of the subjects on the pretest was low enough to indicate that regression to the mean contributed substantially to posttest improvement. (A table of data and references are appended.) (NKA)

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TRAINING STUDENTS IN AN OCCUPATIONAL TRAINING PROGRAM
TO SELF-REGULATE READING COMPREHENSION

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The purpose of the study was to assess the effects of training in self-awareness and self-regulation on the reading comprehension of students in a postsecondary occupational training program for welders. Such metacognitive processes are widely acknowledged as important factors in comprehension and learning (Armbruster and Brown, 1984). In problem solving and learning contexts, superior performers seem to self-monitor their levels of success and adjust appropriately.

The notion that strategies for effective learning can be taught has received considerable attention from researchers during the past decade. In the context of problem solving, (Sternberg, 1977) suggests the possibility that intellectual aptitude can be enhanced through instruction in the use of metacognitive methods. Examinations of the effects of self-regulatory strategies on learning show the positive influence of learning-to-learn strategies on new learning experiences (Bransford, 1979).

Self-regulation of reading comprehension has been the focus of recent studies (Collins and Smith, 1982; Palincsar, 1984) which have addressed specific aspects of instruction in techniques of monitoring and enhancing comprehension. While noting that training in such techniques results in

worthwhile and reliable improvements, Baker and Brown (1984) express chagrin over the lack of research dealing with adult metacognition.

The instructional strategy employed in this study involved reciprocal teaching and four comprehension monitoring/regulating techniques (self-questioning, summarizing, predicting, and critical evaluation of text) known to be important in comprehension. Derived from the ReQuest Procedure (Manzo, 1969), reciprocal teaching has been extended by Collins and Smith (1982). The method was recently refined by Palincsar (1984) as a tool for teaching comprehension monitoring/regulating techniques to remedial readers at the junior high school level.

METHOD

Subjects

The study involved eleven students enrolled in a community college technical training program in welding. The laboratory course in which the study was conducted was required of the welding curriculum.

Materials

During the intervention phase, training sessions provided practice of metacognitive methods through reciprocal teaching, and required subjects to read a 1000 to 1500 word passages of expository technical prose.

Passages of approximately 500 words, used at the end of each intervention session, and in maintenance and assessment phases of the study, were taken from technical sources of different content, but similar readability to that of the materials used in reciprocal teaching sessions.

A taxonomy (Pearson and Johnson, 1978) was used to develop ten questions (four text-explicit, four text-implicit, and two script-implicit) for evaluating student comprehension of each passage. Text-explicit questions had clearly stated answers in the passage. Text-implicit questions required integration of information from different parts of the passage. Answers to script-implicit questions relied on reader ability to apply prior knowledge and experience to the passage.

Pre- and posttests involved administration of alternate forms of the Cooperative English Test Form 2, Reading Comprehension.

Procedure

The study employed a multiple-baseline procedure. Each subject experienced four conditions: baseline, intervention, maintenance, and assessment. A standardized test of reading comprehension was administered just before baseline and immediately after assessment phases.

Prior to initiation of the study, three one-hour training sessions were conducted by the principal investigator for the course instructor and co-investigator, each of whom had read and discussed reports of studies involving reciprocal teaching and metacognitive methods. Following a review of four comprehension self-monitoring/enhancing activities--self-questioning, summarizing, predicting, critical evaluation of text--the reciprocal teaching procedure was demonstrated. The four part metacognitive procedure was then modeled and practiced via reciprocal teaching.

Baseline activities involved three 20 minute sessions in which students were instructed to read assessment passages carefully. Comprehension questions were answered in writing after each reading.

Intervention activities involved instruction in the use of the four self-regulated comprehension activities during twenty minute sessions of three consecutive class meetings. In order to minimize the class time devoted to the study, two groups were formed within the class. Each group was led by a faculty instructor who began by modeling the four comprehension self-monitoring/regulating techniques, then passing the teacher's role along to student members of the group. In the final minutes of each intervention session, assessment passages were read and answers to comprehension questions written.

Maintenance activities were conducted over three sessions, beginning immediately after intervention sessions terminated. Maintenance sessions were similar in format to baseline except that comprehension questions were not presented.

Assessment tests were conducted five weeks after the maintenance sessions were concluded. During a single one-hour session, three assessment exercises were done in order to evaluate the effects of training and practice in the self-regulation of reading comprehension.

During periods of one hour each, a pre- and postexperimental administration of the Cooperative English Test, Form 2B and 2C, reading subtest was conducted in order to provide a comparison with experimental measures of comprehension. Pretesting was accomplished just prior to the initiation of baseline activities. The posttest was given the week after assessment activities were completed.

RESULTS

Statistical analysis of subject performance on six measures of reading comprehension--baseline, intervention, assessment, year-end, and standardized pre- and posttests--was done through simple T-tests. Table One shows results of the comparisons.

Insert Table One about here

Baseline and intervention results were not significantly different $T = -.1424$, $sig = .4425$. Assessment means were negatively correlated with both baseline and assessment

means, $T = -4.6515$, $sig = .001$. Comparisons of year-end comprehension measures showed absence of significant differences with baseline, $T = .4411$, $sig .3379$, and intervention $T = 1.0032$, $sig = .1782$.

Results of pre- and postexperimental comparisons of total reading raw score means of the Cooperative English Test showed significant gains. The pretest mean ranked the group in the lowest three percent of college freshmen. Posttest mean was nearly double the pretest mean, placing the group in the lower quartile. This questionable increase is discussed below.

DISCUSSION

The time and effort spent on this pilot study did not produce enlightening results. Negative correlations between investigator designed pre- and postexperimental measures of comprehension were due, at least in part, to the fact that assessment measures were more difficult than baseline and intervention measures. An unknown which may have affected this result was the amount of reading done by the subjects during the interval between intervention and follow-up measures. Another possibly influential factor was the

amount of actual application of the metacognitive reading techniques during the period. In both cases, absence of practice would act as a detriment to maintenance of skills. Unfortunately, records of reading time and use of reading techniques were not kept.

Two factors rendered Cooperative English reading comprehension test comparisons uninterpretable. First, though substantial growth in achievement was indicated, absence of a control group left no basis for comparison. Second, the average achievement of the subjects on the pretest was low enough to suggest that regression to the mean contributed substantially to posttest improvement.

Still, the pilot was useful and the pitfalls identified will be addressed in the follow-up study. First, greater care has been taken in establishing the difficulty of passages and comprehension questions. Here, three readability measures will be used: the Fry Readability Graph, Clark's (1981) phrase analysis (PHAN) system, and expert judgement. Second, records of subject reading time and use of metacognitive methods beyond the experimental activities will be kept. Third, the multiple baseline across groups design will be used. If technical program enrollment is great enough, a control group will be used as

insurance against historical difficulties. Fourth, contingent upon control group availability, the Nelson-Denny Reading Test will be used as the standardized measure of reading comprehension; its level of difficulty is more appropriate for the abilities of the study subjects.

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Table One
Means, Standard Deviations
for Comprehension Measures

<u>Baseline</u>	<u>Intervention</u>	<u>Assessment</u>	<u>Year-End</u>	<u>Pre Coop.</u>	<u>Post Coop.</u>
19.5 (4.2)	18.9 (2.82)	13.9 (4.2)	20.2 (3.28)	34.7 (10.6)	66.6 (10.4)