ED 364 296   JC 940 013

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TITLE   Starting at the Top: Using Hierarchical Structure To
                Train College Students To Summarize.
PUB DATE   Mar 93
NOTE   7p.; Paper presented at the Annual Meeting of the
                Eastern Educational Research Association (15th,
                Hilton Head, SC, March 5-y, 1992).
PUB TYPE   Reports - Descriptive (141) -- Speeches/Conference
                Papers (150)

EDRS PRICE   MF01/PC01 Plus Postage.
DESCRIPTORS   *Cognitive Style; Community Colleges; *Learning
                Processes; Learning Strategies; *Reading Skills;
                Reading Writing Relationship; *Recall (Psychology);
                *Remedial Instruction; *Retention (Psychology); Two
                Year Colleges; Two Year College Students; Writing
                Instruction; Writing Skills

ABSTRACT
                A study was conducted of the effectiveness of
summarization training as a means of improving reading comprehension
and retention among developmental English students in a community
college. A sample of 58 community college students in five
developmental reading classes was randomly assigned to either a
summarization treatment or control group. The control group received
training in vocabulary and comprehension for 1.25 hours per week for
5 weeks. The summarization training group received instruction for
the same amount of time on identifying the central thesis, major
concepts, and details closely supporting these concepts. Both groups
were assigned, graded, and given feedback on related assignments.
After training, both groups were tested on summarization and reading,
and 1 week later, on delayed recall of the last passage summarized.
The summarization training group performed substantially better than
the control group on the summarization post-test. Almost 73% of the
summarization training group included 70% or more of information
deemed necessary for inclusion in the summary, compared to 14% of the
control group. For delayed recall of the material, the effect for
training group was not significant, though there was a trend favoring
those who were trained in summarization and those who scored highest
on the post-test. Based on study findings, it was concluded that
developmental students can be taught to analyze the top-level
structure of reading material, across a range of cognitive abilities.
(ECC)

Starting at the Top:

Using Hierarchical Structure to Train College Students to Summarize.

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Use of hierarchical structure focusing on central ideas aids reading comprehension and retention, but its effect on summarization was undocumented. Developmental English college students were randomly assigned either to summarization training or to active reading training (control group). A regression model using training group, cognitive ability and their interaction indicated a significant effect for training. Lack of interaction indicated that summarization training was equally effective for students at various cognitive levels. Generalization to other measures was assessed via a regression model using group, summarization posttest and their interaction. For delayed recall, there was a nonsignificant trend favoring summarization training and higher scores on the summarization posttest. For a standardized reading test, there were no significant effects.

Effective summarization, capturing major points and their relationships, is a desirable skill in students at any level, but is increasingly important as texts become more complex. Developmental students in community college summarize about as well as 5th graders--they need help!

In the relevant literature, though, there is a striking gap. On one hand are (bottom-up) rule training studies, typically involving short, simple texts and not much shorter summaries. Students as young as 4th grade are assigned to find/create a main idea sentence for each paragraph, and to combine like items (apples, oranges) into categories. Close attention to trivia, however, can obscure the major points in more complex text.

In contrast, hierarchical structure studies (e.g., Meyer & Rice, 1980) identify central thesis, major concepts and details closely supporting these concepts. This approach has been found to aid reading recall for university students (Slater & Graves, 1986) and often for relatively high ability junior high students (Bartlett, 1978; Meyer, 1981; Taylor & Beach, 1984). Yet community college students are often lower in reading, writing and logic than younger high ability students. And while a top-down approach seemed potentially helpful in summarization training for developmental students, the hierarchical structure studies typically analyzed only effects on reading recall, not on summarization.

The issues examined in this study were not so much nested within one theoretical framework as within the potential but unproven overlap of three bodies of literature--hierarchical structure of text in reading, training for summarization in writing, and pedagogy for underprepared college students. The central concern was whether those separate fields are in fact overlapping, in that a key conceptualization about reading is also applicable to a challenging writing task and can be used to help developmental college students.

The closest prior study raised questions about both effectiveness and cost-effectiveness. In a group training study, Day (1980) lost 2/3 of her sample comprised of

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students enrolled in freshman composition courses. Next she trained developmental students individually to use summarization rules for summary writing. In neither case were final summaries well written, raising the question of whether developmental students can benefit from such training. Furthermore, individual training is expensive. Group training, if it works, could be a cost-effective alternative. We need to know first,, whether developmental students as a group can profit from top-down hierarchical training in summarization, and second, which students (relatively high or low cognitive ability) profit most. The answers could clarify theory and guide allocation of scarce resources.

A secondary issue was whether training, if successful, would generalize to other measures. Would type of training, outcome of training or their interaction predict delayed recall of a passage previously summarized? Similarly, would these variables predict scores on a standardized test of reading comprehension? Generalization from summary writing to other skills is not critical but welcome.

METHOD

Sample

A sample of 58 community college students in 5 developmental reading classes were randomly assigned either to a summarization treatment or control (active reading strategies) group. They scored between 50%ile and 70%ile on the Writing Section of the Assessment and Placement Services for Community Colleges test (Educational Testing Service, 1985).

Materials

Passages 1200-1400 words long, representing fields such as business and psychology, were adapted from a reader for college developmental reading classes (Smith, 1987). Higher level structure was typically signaled both by text statements and by headings.

Procedures

A randomized control-group posttest only design was used for the study. The control group received training in vocabulary, comprehension, etc. for 1 1/4 hours per week for 5 weeks. The summarization training group received training on summarizing for the same amount of time. Both groups were assigned, graded and given feedback upon related assignments. After training, both groups were tested on summarization and reading, and, one week later, on delayed recall of the last passage summarized.

Measures

Summaries were scored for presence of 3 top levels of information, based upon Meyer's 1982 work. A weighted scoring system, useful both for research and for classroom applications, was devised. Ten points were given for inclusion of theme, up to 30 points for macropropositions (major ideas) and up to 60 points for details supporting these ideas. Also given were a 1-week delayed recall test of summarization, the Culture Fair Intelligence Test (Institute for Personality and Ability Testing, 1963), and the Diagnostic Reading Test (The Committee on Diagnostic Reading Tests, 1964).

Analysis

Three regression models were employed, using Pedhazur's (1973) systematic procedures. The first, using final summarization scores as outcome was used for testing the effect of training and its interaction with cognitive ability. The second two, using final summarization as a predictor, assessed generalization from summarization ability to delayed

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summary writing ability and to reading ability.

RESULTS AND DISCUSSION

The summarization training group performed substantially better than the control group on the summarization posttest. In fact, almost 73% of the treatment group students included 70% or more of the information deemed necessary for summary inclusion, while only 14% of the control group students were able to accomplish this. Forty percent of the variance in final summarization was accounted for by training group status and only .2 percent by cognitive ability. Group intercepts differed ($p < .001$) to the same extent for students at various cognitive levels.

For delayed recall of material from a passage summarized one week earlier, the effect for training group was not significant at .05 but was significant at $p < .10$, as was the effect for summarization final score, group status and their interaction. Since only 12% of the variance in delayed recall was accounted for by group, summarization ability and their interaction, these cannot be considered strong or stable effects, though they suggest areas for study. Training group, summarization posttest or their interaction accounted for only 6% of the variance in reading test scores.

Training in use of top level structure for summarization was clearly effective and efficient for developmental college students ranging in cognitive ability. This was accomplished with group rather than individual instruction, and thus cost/beneficial.

For delayed recall of summarization, there was a trend favoring those who were trained in summarization and those who scored highest on the posttest, but these effects were not significant at the .05 level. Although summarization and delayed recall tested the same passage and the same procedures, there are some important differences. The delayed recall test was unfamiliar, unexpected and carried out without being able to reread the passage. Students had not previously been asked to reconstruct a text from memory. They had not expected such a request a week later. In addition, the course was over and they were ready to leave. Training in summarization of material in hand could be followed by brief exposure to use of structure in recalling material later.

Training in writing summaries did not generalize to reading as assessed here. There are differences in materials and criteria. Passages used for training and testing were complex, well-structured and contained signals as to that structure. Use of that structure was critical to success in summarization. Passages in the standardized reading comprehension test seldom provided or signaled top-level structure. Use of structure was not critical to success. It is well worth examining whether performance on reading tests that emphasize structure in materials and in scoring is more closely related to ability to summarize.

There could have been tradeoffs between instruction in reading and instruction in writing. One possibility was compensation--the summarization group would do better than the control group on writing, but the control group would do better in reading. But no-- while the summarization group outperformed the control group in writing, they also read just as well.

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CONCLUSIONS

Use of top-level structure can be taught to college developmental students. Instruction is equally effective for students across a range of cognitive abilities. Improvement of summary writing can be obtained without individual instruction, great investment of group instructional time and with no cost in reading improvement. Explicit training is probably needed for transfer.

The weighted scoring system developed here can be a useful tool for research and teaching, in that it weights higher levels of importance more heavily. This not only provides an objective scoring system, easily applied after training, but points out to students and teacher what's lacking.

The conceptual framework of hierarchical structure of text, applied primarily in reading, can also be applied to summary writing and thus aid in the instruction of students who are not well-prepared for the demands of college writing assignments. By starting at the top, with focus on the most important ideas and their interrelationships, instruction may help to reshape developmental college students' conceptions about the nature of complex text, the task before them, and the role they need to play in summarizing such text.

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