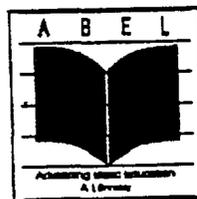


**ANNOTATED BIBLIOGRAPHY  
OF TEXTBOOK RESEARCH  
(DRAFT)**

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Britton, B. (1986). **Capturing Art to Improve Text Quality.** Educational Psychologist, vol. 21 no. 4. 333-356.

This article discusses the effectiveness of revising texts to improve the reader's retention of the material. The author proposes the idea of transferring the art of good writing into a science and reproducing it to improve text quality. In the studies conducted students who read the improved text did not forget (after a 24 hour delay) any of the information recalled immediately after reading, while the ones who read the original version forgot 24% of the information a day later.

Bray, J. and Armstrong, J. (1986) **What's Wrong with Mathematics Textbooks? Views from the Field.** ECS Working Papers, Education Commission of the States, Denver.

The authors present the major problems with mathematics textbooks, such as "Out-of-date tests which have a stagnating influence on texts," the setting of minimum competencies, and the issue of narrow focus in the classroom and not taking into account those not bound for college. In the section on instructional design the issues are the lack of time and training in the use of texts, lack of imagination in supplementary materials. The authors provide several suggestions for improving the instructional design of mathematics textbooks, such as educating teachers about appropriate use of instructional materials, increase communication between publisher, state officials, districts and schools, base instructional design on research and design more open ended materials for high quality and flexibility of instructional approach.

Roth, K., Roth J. and Anderson C. W. (1987) Institute for Research on Teaching, **The Power Plant; Teacher's Guide to Photosynthesis.**

The Power Plant is a set of instructional materials about photosynthesis that was used in a research study of middle school science teaching during 1985-86. The Middle School Science Project investigated ways to help middle school science teachers use teaching strategies that were identified in earlier studies as particularly effective in promoting meaningful conceptual-change learning. Such learning requires students to go beyond memorization of facts and terminology and to make sense of scientific explanations of phenomena. For students, such learning in science often requires them to go through a difficult process of conceptual change, reshaping and abandoning ideas or misconceptions that they have developed from experience and have believed for a long time.

Two groups of teachers in the study received The Power Plant teacher's guide as a major source of support in implementing conceptual-change teaching strategies. They used these materials as they taught a unit about photosynthesis in their classrooms. Researchers observed and interviewed the teachers and gave pretests, posttests and delayed posttests to assess student learning. The Power Plant materials were found to be helpful to teachers, and students using these materials were more successful in undergoing conceptual change than students who did not use the materials.

Newton, D.P. and Gott, R. (1989). **Process in Lower School Science Textbooks.** British Educational Research Journal, vol. 15 no. 3. 249-257.

The content of science texts claiming to support process-centered investigative approaches and intended for use in the lower secondary school was analyzed to see how the authors interpreted the approach. In general, the authors used practical activities as a vehicle for concept acquisition, however, when processes were of more importance than concepts, open-ended investigatory work was not as common. Many texts claim to give more attention to this type of work than they actually do, and thus are misleading as well as deficient.

Staver, J.R. and Bay, M. (1989). **Analysis of the conceptual Structure and Reasoning Demands of Elementary Science Text at the Primary (K-3) Level.** Journal of Research in Science Teaching, vol. 26 no.4. 329-349.

Eleven elementary science texts were examined to determine their conceptual structure and reasoning demands. Results show that 1)conceptual structures vary widely across texts; 2)all but two conceptual structures are well defined, in that a single concept or group of concepts is not isolated from the total framework; 3)the reasoning need to comprehend the between-individual concepts is concrete, in that classification, interactional, and direct observational reasoning are necessary; and 4)the reasoning demands are above the development capabilities of a large segment of primary-level children, who function in the preoperational stage. Discussion of the results focuses on the kind of science that is appropriate for primary-level children.

Britton, B.K. and Glynn, S.M. (1987) **Revising Instructional Texts to Improve Retention: Tests of Signaling, Retrieval, Readability, and Revisers' Hypotheses.** Journal of Educational Psychology, September.

Original or revised versions of ten instructional texts were read by undergraduates and then tested for recall or recognition either immediately or after 24 hours. Results showed no difference on the immediate test but a large difference on the delayed test. For the original version, 24 percent of the information available on the immediate test was forgotten after 24 hours, but the revised versions were not forgotten. Several hypotheses for the retention advantage of the revised versions were tested. The results showed that organizational signaling (referring to paragraphing, headings, paragraphs with attached headings, levels of subordination, and type sizes) accounted for 50 percent of the improvement in text retention performance. Signaling increased the stability of the revised texts in memory, perhaps either because it strengthened the memory by providing a framework for its support or because it freed mental resources for performing extra processes that promoted retention, or both.

Anders, P.L. and Bos, C.S. (1986). **Semantic Feature Analysis: an Interactive Strategy for Vocabulary Development and Text Comprehension.** Journal of Reading, April. 610-616.

This article presents an alternative to the traditional method of vocabulary teaching in content subjects. It states that semantic feature analysis (SFA), organizing topics and vocabulary in a hierarchy and relating them to each other, will help students to learn new

concepts better. In a research study into this method of vocabulary acquisition, students showed a substantial increase in students' retention and understanding.

Graves, M. et al.,(1991). **Improving Instructional Text: Some Lessons Learned.** Reading Research Quarterly, vol. 26, 110-121.

A commentary on several studies done to improve texts. In the first study it was shown that professional writers' revisions of a text were more effective for retention than were those of composition instructors. However, in the two most recent studies the results were reversed. The article also discusses some lessons learned about improving instructional text.

Glynn, S.M. **The Teaching-With-Analogies (TWA) Model: Explaining Concepts in Expository Texts.** Chapter prepared for Children's Comprehension of Narrative and Expository Text: Research Into Practice, K. D. Muth (Ed.), Newark, DE: International Reading Association.

Shows that one of the most effective ways for students to integrate their existing knowledge with text content is to do so by means of analogical reasoning. Teachers and text authors can provide analogies for students, and students can be trained to generate their own analogies. Analogies put some difficult concepts into terms and images that are more easily understood and retained. This model has implications for improving texts as well as teachers' guides.

Alexander, P.A. et. al. (1990) **The Role of Interest in Learning from Text.** Paper presented at the AERA Annual Meeting, Boston.

Examines two experiments that look at the effects of "seductive details" on learning. The subjects were given two sets of texts to read; one considered to be "generally interesting" and the other "generally uninteresting" using seductive details either as asides or embedded in the text. The results showed that students who read the interesting text tended to remember more of the "big" ideas than the others and the "seductive details" were potent whether as asides or embedded in the text.

Yussen, Steven R. et. al. (1991). **Learning and Forgetting of Narratives Following Good and Poor Text Organization.** Contemporary Educational Psychology, vol. 16. 346-374.

Reports research on how people learn and remember stories. It suggests that people remember stories better if they are presented in good form rather than poor form. In three experiments, college students repeatedly read and recalled the same stories presented in good and poor form. Students showed superior recall of narratives presented in good form.

Nicely, R.F. Jr. (1985). **Higher-order Thinking Skills in Mathematics Textbooks.** Educational Leadership, 26-30.

Discusses an analysis of mathematics textbooks and based on this data proposes that changes be made in their content. The article states that teachers tend to use textbooks which

do not pose real problems for application. The author suggests that publishers employ instructional designers to work with the mathematicians and mathematics educators who write the books.

Beck, I. McKeown, M. and Worthy, M.J. (1993). **Questioning the Author: An Approach to Enhancing Students' Engagement with Text.** Paper presented at the AERA Annual Meeting.

Discusses a new approach to enhancing students' reading comprehension called "Questioning the Author". This approach consists of demystifying the author with focusing queries designed to get the students to think in more depth about the meaning and not just content of the text. These findings have implications for both textbooks and teachers' guides.

Glenn, A.D. and Johnson Lewis, J. (1982). **Analyzing the Textbook to Improve Student Reading and Learning.** Reading World, 293-299.

Presents five critical areas for evaluating a textbook including; readability factors, use of concepts, illustrations, and matching the cognitive level of the students with the level of the materials in the text. It provides the reader with key questions needed to determine whether or not a textbook can be used effectively in the classroom.

Hidi, S. and Baird, B. (1988). **Strategies for Increasing Text-based Interest and Students' Recall of Expository Tests.** Reading Research Quarterly, Fall, 465-483.

Measured the extent to which text-based interest affects students' cognitive performance. The researchers attempted to develop strategies to create interest in expository texts used in schools in order to improve recall. The results indicated a boost in students' subjective interest and an increase in overall recall when compared with standard texts, but not a significant one. A content analysis showed that interest-evoking strategies served to increase students recall of concrete, specific, or personally involving information, but not their acquisition of more abstract, general, or scientific information.

Editors, The National Center for Effective Schools Research & Development. (1992). **Textbooks: What's at Stake? Focus in Change.** Spring, no. 6.

The Texas Board of Education voted to approve new U.S. history textbooks - with the proviso that over 3,700 errors in the books be corrected by their publishers and a hefty fine be paid.

Duffelmeyer, F.A., Baum, D.D. and Merkley, D.J. (1987). **Maximizing Reader-Text Confrontation with an Extended Anticipation Guide.** Journal of Reading, November, 146-150.

Discusses the value of anticipation guides to get students to draw out their previous knowledge for fuller understanding of text information. The authors state that using a more interactive extended anticipation guide where text information is reinforced with follow up questions is more effective than the traditional anticipation guide. This interactive technique may be applied to other kinds of texts and included in teachers' manuals.

Duffy, T.M. et al, **Models for the Design of Instructional Text.** (Instructional Systems Technology, Indiana University).

This research replicated and extended prior research evaluating expert revision strategies. Four texts were compared: a segment from a high school history text and revisions of that text by text linguists, composition teachers, and Time-Life writers. Performance on free recall and short answer tests as well as student ratings of interest and ease of learning all indicated that the revision by the composition teachers was most effective. This confirms prior work by Van Dusen et al. (1987) but fails to confirm the original study by Graves et al. (1987). Alternate strategies for contributing to improvement in the quality of textbooks, including the development of models, are discussed.

Steinley, G.L. (1987). **A Framework for Evaluating Textbooks,** Clearing House, November. 114-118.

Provides an outline that may be used to evaluate and select textbooks for greater student comprehension. The framework is based on two factors: 1) the relations between the ideas in the text and the reader's prior knowledge and experience (Relating) and 2) relations between the parts of the text (Organizing). Good and frequent examples, analogies when needed, conversational tone, style, vocabulary assistance and adequate explanations, and illustrations are examined when evaluating its relating qualities. When looking into the organizing qualities Steinley discusses these characteristics: headings and subheadings for constructing hierarchical as well as logical relationships among ideas, sentence and paragraph coherence, organizing strategies, and location of charts, graphs and figures.

Kintsch, W. (1986). **Learning from Text.** Cognition and Instruction, vol. 3 no. 2. 25-46.

Kintsch discusses two studies which investigate the relationship between students ability to remember information from a text and their ability to apply it. The first study is about word problems in arithmetic and demonstrates that word order as well as word choice have a large effect on the ability of a student to solve the problem. The second study deals with word organization in the use of mental maps in geography. These studies demonstrate the importance of word order and word choice in designing and choosing textbooks.

Armbruster, Bonnie B., and Anderson, T.H. (1984) Producing "**Considerate**" **Expository Text: or Easy Reading is Damned Hard Writing.** Reading Education Report No. 46.

Describes a process to develop a text in which the focus was on coherence and the ideas were structured in the patterns of the discipline (history) as well as the conventions of rhetoric. The authors illustrate their ideas with a sample of a considerate chapter of text. The text itself is called "Americans Develop Plans for Government"

Graves, M.F. (1985). **Forces Influencing Textbook Writing.**

Concentrates on textbook reform; who is involved and what are their theories. It was presented together with another paper entitled "Could Books Be Better Written and Would It Make a Difference?" The author (Graves) discusses five different forces he sees influencing

the writing of textbooks; 1) Readability formulas, 2) Educational designers who isolate text features concentrate on form rather than content. 3) Educational designers who work with collections of text features deal mainly with the coherence. 4) Educational designers who focus on workbooks have set up guidelines for constructing and evaluating workbooks. 5) Textbook reformers want to change what they see as inadequate texts.

Sosniak, L.A. and Stodolsky, S. (1993) **Teachers and Textbooks: Materials use in Four Fourth-Grade Classrooms.** The Elementary School Journal, vol. 93 no. 3, 249-273.

Studies of four fourth-grade teachers in two urban schools in a single school district provide the data for this article. Questions about the roles textbooks play in elementary education and how they come to play these roles were addressed using an ecologically based research approach (interviews and classroom observations) one that considered thought and action and the relationships between these work within and across subjects, and the fuller context of teachers' conditions of work. Using this approach, we found that the influence of textbooks on classroom instruction and teachers' thinking was somewhat less than the literature would have us expect. Patterns of textbook use and thinking about these materials were not necessarily consistent across subjects even for a single teacher, and the conditions of elementary teachers' work encouraged selective and variable use of textbook materials.

Loewenberg Ball, D. and Feiman-Nemser, S. (1988). **Using Textbooks and Teachers' Guides: A Dilemma for Beginning Teachers and Teacher Educators.** Curriculum Inquiry, Vol. 18 no. 4.

Based on data from a longitudinal study of teacher preparation conducted at a large Midwestern U.S. university, this article describes and appraises what elementary teacher education students were taught about textbooks, what they learned, and what they did with these lessons during student teaching. Although the student teachers were enrolled in two different teacher education programs, all of them developed the impression that if they wanted to be good teachers, they should avoid following textbooks and relying on teachers' guides. This has implications for the future development of both textbooks and teachers' guides.

Chiang-Soong, B. and Yager, R. (1993) **Readability Levels of the Science Textbooks Most Used in Secondary Schools.** School Science and Mathematics, vol. 93 no.1, 24-27.

Betty Chiang-Soong and Robert E. Yager present in this paper studies that have been done to measure the readability of junior high and high school science textbooks. Fry (1977) and Raygor (1977) readability graphs were used to evaluate the level of the books and compare them to the level of students by which they are used. The authors discuss the shortcomings of the commonly used readability graphs and indicate that using these graphs as the sole measure of a textbook's worth is insufficient. This study suggests a change in the way a textbook is chosen for use in schools.

Gulgoz, S., Britton, B. and Glynn, S. (1987) **Retention of Texts Revised by Robert Graves: Tests of Graves', Readability, Signaling, and Retrieval Hypotheses.**

Original versions or revised versions of 12 texts were read by undergraduates. The original version had been written by 12 different authors; the revised version were written by Robert Graves, the prominent English author, with a collaborator. Retention of the original and revised texts was tested either immediately or after 24 hours, with recognition or recall tests. Tests of hypotheses based on Graves' stated changes, on signaling, and on a retrieval hypothesis did not support the hypothesis. A hypothesis based on classical readability results was supported: the texts that were improved the most were those with the largest reduction in word length. A diagnosis-remediation model for text design is proposed.

Van Dusen, L., Britton, B. and Glynn, S. (1987). **Retention of Instructional Texts Revised by Three Kinds of Experts: Test of a Retrieval Hypothesis.** Journal of Educational Psychology.

Two history textbook excerpts that had been revised by College Composition Instructors, Time-Life Writers, and Text Linguists were read by undergraduates and then tested either immediately or 24 hours later by free recall, short answer, or recognition tests. Results showed that those texts revised by the College Composition Instructors were retained significantly better than the original versions on all but the recognition test, supporting the retrieval hypothesis. There was no difference in the original text or revisions by the other experts. The composition instructor used a more direct and active style, associated with lower readability formula grade level scores, shorter sentences, and a higher verb-to adjective ratio. These findings are important in the discussion of textbook development.

Britton, B., Van Dusen, L., Gulgoz, S. and Glynn, S. (1989)**Instructional Texts Rewritten by Five Expert Teams: Revisions and Retention Improvements.** Journal of Educational Psychology, vol. 81 no. 2, 226-239.

This paper presents the results of a study where 700 undergraduates were tested three times on 52 texts that were revised by five experts. The experts claimed their revisions would increase retention of information by the students. Results showed that revisions made by three out of five experts improved retention. The kind and number of revisions and improvements varied across the text sets. It was concluded that some experts have effective knowledge about improving instructional text, but it exists primarily in procedural form. This suggests that improving instructional text is important but should be undertaken by a combination of people not only those deemed as experts.

Britton, B., Van Dusen, L. and Gulgoz, S. (1991). **Reply to [A Response to: 'Instructional Texts Rewritten by Five Expert Teams']**. Journal of Educational Psychology, vol. 83 no. 1, 149-152.

The results of Graves and Slater's (1991) experiments corroborate Britton et al's findings that the College Composition Instructors' revisions of two history texts were learned better than the Original, Time-Life's and Discourse Researchers' revisions. Besides methodological flaws in experiment 1, the authors point out similar flaws in experiment 2. They also discuss the impact of the conclusions of this study on scholarly and popular literature. Their revisions have led to valuable contributions is discourse processing research.

Sharp, D. et al, (1993). **Developing Strategic Approaches to Narrative Structures with Integrated-media Environments for Young, At-risk Children.** AERA, Atlanta.

This paper is a discussion of the research into the use of video and computer technology for helping young, at-risk children. Interactive video and computers can be effective in developing a generative, strategic approach to language comprehension and reading. The focus of the research is on activities that facilitate the building of good mental models for narratives. Several studies were conducted where video and computers were used to aid children in their comprehension of stories. The results of these studies concluded that young children achieve better comprehension with video stories than with verbal stories, however, video presentation by itself is not sufficient for enabling at-risk children very high levels of comprehension or transfer of this to non-video stories. In order to take advantage of the positive effects of video, MOST (Multimedia Environments that Organize and Support Text) Environments were instituted in Nashville Tennessee. This program aims to increase comprehension and strategy use by at-risk kindergartners as well as provide useful tools for introducing them to effective approaches to narrative structures through the use of interactive video and computer support to facilitate discussions centered around bookmaking.

Staver, J. and Bay, M. (1987). **Analysis of the Project Synthesis Goal Cluster Orientation And Inquiry Emphasis of Elementary Science Textbooks.** Journal of Research in Science in Teaching vol. 24 no. 7, 629-643.

The purpose of this descriptive study was to examine units of commonly used elementary science texts, using the Project Synthesis goal clusters as a framework for part of the examination. An inquiry classification scheme was used for the remaining segment. Four questions were answered: 1) To what extent do elementary science textbooks focus on each Project Synthesis goal cluster? 2) In which part of the text is such information found? 3) To what extent are the activities and experiments merely verifications of information already introduced in the text? 4) If inquiry is present in an activity, then what is the level of such inquiry?

In general, results of the analysis are: 1) most text prose focuses on academic science; 2) remaining text prose focuses on the personal goal cluster; 3) the career and societal goal clusters receive only minor attention; 4) text illustrations exhibit a pattern similar to text prose; 5) text activities/ experiments are academic in orientation, almost to the exclusion of other goal clusters; 6) end-of-chapter sentences are largely academic; 7) inquiry is present only in limited forms in text activities/experiments; and 8) texts allocate only a minor portion of space to activities/experiments.

Beck, I. Mckeown, M. and Gromoll, E. (1989) **Learning from Social Studies Texts.** *Cognition and Instruction*, vol. 6 no. 2, 99-158.

Describes and analyzes the content and presentation of curriculum and text material of social studies programs in grades 4 and 5. The purpose was to understand the instructional issues in order to develop hypotheses about social studies learning. In the article the authors, focusing on geography in grade 4 and history in grade 5, have identified several problems and explained why these inhibit learning. Some of the major problems include; lack of

consideration of what students should come away with, and little attempt to make connections between events.

Guth, H. Boynton, R. and Squire, J.(1989). **The Textbook Gap: A Teacher-Author-Publisher Dialogue.**English Journal, October, 13-21.

A compilation of three commentaries on the quality of textbooks today, this article discusses many of the critiques of textbooks. The critiques include; textbook authors tend to try an please everyone, acquiescing to public demand; and they teach students what to think, but not how to think. One critique was that the quality of texts has been declining for the past fifteen years.

Nibbelink, W., Gerig, J. and Hoover, H. (1993) **The Effect of Print Size on Achievement in Mathematics Problem Solving.** School Science and Mathematics, vol. 93 no. 1, January, 20-23.

Asserts that changing the size of print in mathematics textbooks has little or no effect on problem solving abilities of students.

Kim, H. (1993) **A Comparative Study Between an American and A Republic of Korean Textbook Series' Coverage of Measurement and Geometry Content in First Through Eighth Grades.** School Science and Mathematics, vol. 93 no. 3, March, 123-126.

Examines the content of geometry textbooks in the United States and the Republic of Korea: Korean students understand far more concepts in measurement and geometry at an earlier age than American students do. This mainly is attributed to the organization of information in each content area.

Alvermann, D. (1982) **The Role of Textbooks in Teachers' Interactive Decision Making.** Reading Research and Instruction, vol. 26 no. 2, 115-127.

Twenty four content area teachers' decisions about what adjustments to make in class discussions of textual material were examined in terms of how the textbook figured into those decisions. Results showed differences among the content areas in terms of how the teacher used the text in making decisions about adjustments in class discussions.

Barr, R. and Sadow, M. (1989) **Influence of Basal Programs on Fourth-Grade Reading Instruction.** Reading Research Quarterly, Winter 45-71.

The authors examined and analyzed how fourth-grade teachers from two U.S. school districts used their basal reading programs. They examined the basal programs used, observed classes, and conducted interviews with teachers during the course of the school year. Based on results of these analyses, the authors suggest four conclusions. First, basal programs differ in important respects; the two studied differed in organizational complexity, but were similar in content. Second, the design of the basal program influences the extent to which materials for students are assigned and read. Third, the programs included many skill

activities, and instruction showed a similar emphasis. Fourth, teachers differ in how much they rely on pre and post-reading recommendations in the teacher's guide.

Cloud-Silva, C. and Sadoski, M. (1987) **Reading Teachers' Attitude Toward Basal Reader use and State Adoption Policies.** Journal of Educational Research, vol. 81 no. 1, Sept./Oct, 5-16.

Primary school teachers in Texas were surveyed to determine a) attitudes towards basal readers as a teaching method; b) the extent of their use of the readers; and c) perceptions of state reading textbook adoption policies. Results indicated widespread use of the basal readers, but not as much as what was assumed. Many teachers supplemented the readers with other materials. They were also concerned that their input was not considered enough in state textbook adoptions.

Barr, R. (1988). **Conditions Influencing content Taught in Nine Fourth-Grade Mathematics Classrooms.** The Elementary School Journal, vol. 88 no. 4, 387-411.

Presents a theoretical analysis of how such class conditions as textbook organization and content, composition of class, instructional time, and teacher's beliefs influence the mathematics content that teachers introduce. The results of this analysis concluded that textbook characteristics, class composition, and teacher's beliefs were related to the amount and order in which content was presented, but instructional time was not.

Wahl, J. and Cicchelli, T. **Naming Fluency on Visual and Verbal Mnemonics for Transference, Recall, and Categorization of Secondary Global Studies Knowledge.**

Naming fluency and visual and verbal mnemonics were used and their interactions for transfer of strategy to a new task for recall and categorization of facts about world religions. Although no significant differences were found, 57% of the students voluntarily transferred the strategy, after a 2-day delay over 80% of the material was recalled and categorized, and after a week over 60% of the material was recognized.

Zahorik, J. (1991). **Teaching Style and Textbooks.** Teaching & Teacher Education, vol. 7 no. 2, 185-196.

The purpose of this study was to examine the influence of teacher ideology on teaching style and the relationship between teaching style and textbook use. Questionnaires were administered to 103 teachers asking them to develop a lesson related to a provided textbook chapter and to indicate their beliefs about students, knowledge, and teaching. Three main teaching styles were found: coverage, extension, and thinking. These styles are generally associated with textbook use but were used extensively both with and without textbooks. It was also found that teaching style is related to teacher ideology.

Wade, S. and Adams, R. (1990) **Effects of Importance and Interest on Recall of Biographical Text.** Journal of Reading Behavior, vol. 22 no. 4, 331-353.

The purpose of this study was to investigate structural importance and text-based interest which affect what students remember from their reading. Two experiments were

conducted; the first to determine what the students find important or interesting in a text and the second to determine students recall of text material. The two categories of information that were best remembered were seductive (interest catching) details and main ideas, both of which were rated as interesting in the first experiment. The least remembered were details supporting the main ideas, which had been rated as important but uninteresting.

Alvermann, D. and Boothby, P. (1982) **Text Differences: Children's Perceptions at the Transition Stage in Reading.** The Reading Teacher, December, 300-302.

Fourth grade children were able to tell the differences between expository and narrative text, but still needed guidance in how to read the two types of materials best.

McGoldrick, J., Bergering, A., Martin, J. and Simons, S. (1992) **Locating Discrete Information in Text: Effects of Computer Presentation and Menu Formatting.** Journal of Reading Behavior, vol.XXIV no.1, 1-20.

The authors examined locating information in a text chapter presented via a microcomputer. The present experiment attempted to determine if there were differences in locating discrete information in printed versus computerized text. Undergraduates in an introductory psychology course attempted to find answers to six factual questions in text presented via either medium. The computer search tended to be more time consuming and less efficient than the printed text search and no differences were found in the number of correct answers found.

Wade, S., Schraw, G., Buxton, W. and Hayes, M. (1993) **Seduction of the Strategic Reader: Effects of Interest on Strategies and Recall.** Reading Research Quarterly, vol. 28 no. 2, April/May/June, 93-114.

Presents the argument that embellishing texts with seductive details reduces the reader's retention of main ideas. The authors wanted to know if interesting information in a text was easy to remember and thus requires less attention or do readers devote more time to this information because it is interesting. The results of two experiments showed less attention paid to the more interesting parts of the text than to what was considered the more important parts, however, there was a high recall rate of interesting information.

Wade, S., Buxton W. and Kelly, M. (1993). **What Text Characteristics Create Interest for Readers.** Paper presented at the 1993 AERA Annual Meeting.

Two studies were conducted to determine what skilled readers consider interesting in two texts and what text characteristics they identify as affecting their interest. One factor that contributed to both interest and comprehensibility was the use of description and concrete detail that enhanced visualization. Another factor was the use of comparisons and easily grasped analogies that enabled the readers to relate new concepts or information to prior knowledge and experience.

Britton, B. and Tidwell, P. **Shifting Novices' Mental Representations of Texts Toward Experts': Diagnosis and Repair of Novices' Mis-and Missing conceptions.** Institute for Behavioral Research (U. of Georgia).

Two experiments were conducted to determine the gap between novice and expert mental representations and the extent of mis- or missing conceptions in two versions of the same text. The results showed a shift in both of these from subjects reading the original text to those reading the revised text. Texts can change the mental images as well as repair mis and missing conceptions.

Horiba, Y. and van den Broek, P. (1993). **Second Language Readers' Memory for Narrative texts: Evidence for Structure-Preserving Top-Down Processing.** Paper presented at the 1993 AERA Annual Meeting.

Examines the extent to which structural properties such as causal factors, story-grammar category, and hierarchical level are utilized by second language readers to "fill in" the gaps in their mental images. Using meaning-preserving and structure-preserving as the scoring criteria it was found that second-language readers scored higher in structure-preserving than in meaning-preserving.

Baldwin, S., Peleg-Bruckner, Z., and Ann H. McClintock (1985) **Effects of Topic Interest and Prior Knowledge on Reading Comprehension.** Reading Research Quarterly, vol. 20 no. 4 Summer, 497-504.

The purpose of this study was to separate the effects of prior knowledge and topic interest on reading comprehension. Subjects were 7th and 8th graders who completed a 10-item interest inventory and took a 100-item prior knowledge test. Based on these measures each subject read passages and took comprehension tests for which they had various combinations of high and low prior knowledge and topic interest. Results indicated significant effects for both prior knowledge and topic interest. Boys were more influenced by topic interest than girls.

Freeman, D. et al. (1983). **Do Textbooks and Tests Define a National Curriculum in Elementary School Mathematics?.** The Elementary School Journal, vol. 83 no.5, 501-513.

Examined the relation between content taught in classrooms and textbooks and the content tested on standardized exams. Many educators believe there is a reasonable match between what is taught and what is tested, but this investigation challenges this assumption for fourth grade mathematics. Only 50% of the topics on a fourth-grade standard mathematics test are covered in any one textbook of the same level.

Guthrie, J., Weber, S. and Kimmerly, K. (1993). **Searching Documents: Cognitive Processes and Deficits in Understanding Graphs, Tables and Illustrations.** Contemporary Educational Psychology vol. 18, 186-221.

Two studies were conducted exploring how people read and understand graphs, tables and illustrations. The authors propose that it requires a higher order process of abstraction to search for main ideas in graphs and illustrations than in text. The studies

showed that students could locate specific information, but scored lower when it came to perceiving trends and patterns. Apparently most of the students had not learned the abstraction process, suggesting that it may need to be taught directly.

Durgunoglu, A.Y. and Jehng, J.C. (1989). **The Effect of Cognitive Flexibility and Text Organization on Knowledge Acquisition**. Paper presented at the AERA Annual Meeting, San Francisco.

The authors conducted a study to examine how cognitive flexibility and text organization affects knowledge acquisition. In this experiment they compared a task which required active inferencing with a task which required direct retrieval of information from memory. The text organization only affected the recognition, but not the active inferences, whereas the cognitive flexibility affected the inferences but not the recognition. The authors concluded that an active manipulation of knowledge representation is employed to compute an inference rather than a passive default slot-filling.

Nelson, W. (1991). **Adjunct Questions as a Learning Strategy for Hypertext Documents**. Paper presented at the AERA Annual Meeting, Chicago.

An experiment was conducted to examine whether presenting adjunct questions in various positions within a hypertext document had any effect on retention of information. Results indicated that while there were significant differences in retention, the greatest retention was produced by a Read Only treatment with no adjunct questions. Various factors which could account for these findings are discussed.

Nelson, W. (1991) **Effects of Prior Knowledge and Task Characteristics on Information Access in Hypertext documents**. Paper presented at the AERA Annual Meeting, Chicago.

This study investigates how prior knowledge and task characteristics will affect the reader's patterns of information access in a hypertext document. The results of this study suggest that participants with different levels of prior knowledge, and varying goals for reading, elected different types of links in a hypertext document. Also they tended to select different types of links in at various stages during the task, concentrating on definitions and examples in the early stages, and related ideas and applications during the later stages.

Whitman, Nancy C., et al., (1990). **The Attained Geometry Curriculum in Japan and Hawaii Relative to the Van Hiele Level Theory**. Paper presented at the AERA Annual Meeting.

This paper compares how students in Hawaii and Japan are distributed relative to the van Hiele levels. To measure the attainment of van Hiele levels three tests were developed. The results show that the Japanese students are about two years ahead of the Hawaii students. Part of this difference can be accounted for by the curriculum and by instruction in verbal communication. Also, language and context can influence how a student responds to a test item.

Amiran, M.R. and Jones, B.F. (1982). **Toward a New Definition of Readability.** Educational Psychologist, vol. 17, no. 1, 13-30.

Within a general framework of structure-of-text research, a new definition of readability is proposed, based on three textual variables: structure, "texture" and informational density of text. The interactions of reader and textual variables in the act of comprehension are discussed, the reader variables being world knowledge and ability to use learning strategies. A number of hypotheses for future research on readability are presented and implications for teaching are suggested.

Alvermann, D. **Teacher-Student Mediation of Content Area Texts.** Theory into Practice, vol. 28 no. 2 142-147.

This article interprets the major findings of a study relating textbooks and discussions. It examines the fact that most teachers' demonstrations of discussions looked more like recitations than discussions in light of how texts were mediated in three eighth-grade science teachers' classrooms. The authors conclude that teacher decisions influence what students have the opportunity to learn, what they attend to, can do, and how they learn, because these decisions directly affect how the meaning of the text is mediated.

Britton, B., Van Dusen, L. Glynn, S. and Hemphill, D. (1990). **The Impact of Inferences on Instructional Text.** The Psychology of Learning and Motivation, vol. 25, 53- 70.

The authors examine how inferences are related to the retention of information contained in instructional text. Their studies show that the more inferences were required to link up these texts, the worse they were recalled. One reason for this could be that it requires a large number of cognitive operations to make so many inferences. Also students have had much more experience with making inferences in stories than in expository text.

Mayer, R. (1989). **Systematic Thinking Fostered by Illustrations in Scientific Text.** Journal of Educational Psychology, vol. 81 no. 2, 240-246.

The author discusses the relationship between meaningful learning and the existence of labeled illustrations in a text. The study, which involved two experiments, showed that students reading a passage about car mechanics with labeled illustrations recalled more explanative than nonexplanative information than the control groups. These readers were able to reorganize the information into useful mental models.

Dee-Lucas, D. and Larkin, J. (1991), **Equations in Scientific Proofs: Effects on Comprehension.** American Educational Research Journal, vol. 28 no. 3, Fall, 661-682.

The authors examine the difference between verbal and equation-based proofs and their effects on reader comprehension. The results of their studies show that verbal proofs produced better performance than equation-based proofs on problems relating to both equations and nonequational proof content. This suggests that learners have more difficulty processing equations than verbal statements containing the same content, and that textbooks should emphasize both.

Schunk, D., and Rice, J.M. (1990), **Goals and Progress Feedback During Reading Comprehension Instruction**. Paper presented at the AERA Annual Meeting, April.

This paper discusses the effects of goals and goals-progress feedback on reading comprehension. Remedial readers were provided different levels of instruction some with product goals and others with process goals. Also there was a combined group which received feedback. This group performed much better than the product-goals group. These results show remedial readers benefit from explicit feedback on their mastery of a comprehension strategy. These findings have implications for the preparation of teachers' guides.

Wong, J. and Hu-Pei Au, K. (1985) **The Concept-Text-Application Approach: Helping Elementary Students Comprehend Expository Text**. The Reading Teacher, March, 612-619.

The authors present an argument for the use of "Concept-Text-Application (CTA)" in teaching expository text reading. Retention of large portions of text is important and a technique to aid this absorption is necessary. Also structure and content will be unfamiliar to students so teachers must expect to work through many comprehension problems with the children. CTA has been proven effective in preparing students to meet the demand of "reading to learn".

Alvermann, D., Smith, L. and Readence, J. (1985). **Prior Knowledge Activation and the Comprehension of Compatible and Incompatible**. Reading Research Quarterly, vol. 20 no. 4 Summer, 420-436.

This study examined the effect of prior knowledge activation on average reader's comprehension of compatible and incompatible text. Based on the results of pre-experimental knowledge domain and pilot data measures, the passage on rattlesnakes was judged compatible, while the one on sunlight was not due to counter-intuitive information it contained. Findings supported the notion that prior knowledge may interfere with rather than facilitate, reading comprehension under certain conditions.

Armbruster, B., Anderson, T. Ostertag, J. (1989). **Teaching Text Structure to Improve Reading and Writing**. The Reading Teacher, November, 130-137.

This article explains the details of the problem-solution structure method of teaching that proved successful in improving both reading comprehension and summary writing of fifth graders. In this structure the teacher helps the student identify the problem presented in the text, its attempt to solve this problem and the result of that attempt. By learning the frames and patterns for summary writing the students were able to attend to and remember the main ideas of the text.

Guthrie, J., (1991). **Forms and Functions of Textbooks**. Journal of Reading, March, 554-556.

The author describes the process of creating a textbook. He explains that the content should be decided on first and then the function and finally the form, both of which depend on the content of the book.

Guthrie, J., (1983). **Learning Values from Textbooks.** Journal of Reading, March, 574-576.

Guthrie is challenging the assertions made by Mel and Norma Gabler (Phi Delta Kappan, Oct. 1982) that the content of the books students read in school shapes their values. Guthrie counters that as has been shown in numerous studies the content is only one of many different factors that influence a child's values. By reading about a dishonest character in a book will not necessarily make the child dishonest.

Schmalz, R., (1990). **The Mathematics Textbook: How Can it Serve the Standards.** Arithmetic Teacher, September, 14-16.

This article discusses the influence of textbooks in teaching mathematics. The author suggests that this influence should be decreased and mentions some alternate ways of using textbooks so as to reorganize the sequence and emphasis to conform to the ideas of NCTM's "Curriculum and Evaluation Standards for School Mathematics".

Altbach, P., (1983). **Key Issues of Textbook Provision in the Third World.** Prospects, vol. 13 no. 3, 315-325.

Exploring the major issues relating to textbooks in the Third World, the author gives an historical as well as international context and outlines four areas for discussion. Language, textbooks and publishing, infrastructure and articulation all must be explored when distributing textbooks in developing countries. The author stresses the point that the availability of books appears to be the single most consistently positive school factor in predicting academic achievement.

Agnihotri, R.K. and Khanna, A.L., (1991/1992). **Evaluating the Readability of School Textbooks: an Indian Study.** Journal of Reading, December/January, 282-288.

Examining the issue of readability as it was applied in India the authors used the readability measures that were developed in English for a text in Hindi such as formulae, cloze procedure, and thoughtful analysis of the study passages' conceptual and textual organization. They emphasize the more recent approaches to readability focusing on syntax, conceptual difficulty and organization.

Kinder, D. Bursuck, B. and Epstein, M. (1992). **An Evaluation of History Textbooks.** Journal of Special Education, vol. 25 no. 4, 472-491.

The authors assert that the textbook is the widest used medium for instruction and therefore has a great impact, negative or positive depending on the readability and content. In their study, the authors show the extent of poor texts that are being used in classrooms across the country.

Pearce, D. (1983). **Textbook Production in Developing Countries.** Prospects, vol. 13 no. 3, 327-341.

A comprehensive look at textbook production in Developing Countries this article present the major issues confronting both government controlled textbook production organizations (TPO) and private sector TPOs. Inadequate research, lack of funding and shortage of resources are among the numerous problems discussed.

Aprieto, P. (1983). **The Philippine Textbook Project.** Prospects, vol. 13 no. 3, 352-359.

This article describes the situation before, implementation of, and results of a World Bank textbook project. It discusses how textbooks were is short supply and of poor quality. According to the author this project was wildly successful and provided for further World Bank investment for all phases of education.

Gopinathan, S., (1983). **The Role of Textbooks in Asian Education.** Prospects, vol. 13 no. 3, 344-350.

This is an overview of the educational issues pertaining to textbooks in Asia. It is a general discussion of the role of the textbook and the progress that has been made in its provision. The author speaks in general about all of Asia, but then highlights the points with specific examples. According to the author much progress has been made in the provision of textbooks in Asia.

Woodward, A. (1989). **Learning by Pictures: Comments on Learning, Literacy and Culture.** Social Education, Feb. 101-102.

Woodward argues in his article that because of the overuse of tangential pictures and illustrations in textbooks, reading text has become secondary. It seems that in order to interest and coax a reader into picking up the book there must be numerous photographs and other graphic representations. These should be used strategically and in conjunction with well written text.

Barman, C. (1992). **An Evaluation of the Us of a Technique Designed to Assist Prospective Elementary Teachers Use the Learning Cycle with Science Textbooks.** School Science and Mathematics, vol. 92 no. 2, Feb. 59-63.

This article describes the evaluation of a technique that introduces elementary science methods students to the learning cycle and provides them with a mechanism for using this strategy with current elementary science textbooks. The results of this evaluation indicate that this technique can be one way to help preservice teachers improve their science teaching and become more comfortable with using their textbook as a guide rather than the main component of their lesson.

Dreher, M. and Singer, H. (1988). **Friendly Texts and Text-Friendly Teachers.** Theory into Practice, vol. 20 no. 2, 98-104.

This article explains eight categories of friendly text features and includes examples of several sixth-grade social study texts. It also discusses determinants other than the text

which must be considered in examining text friendliness. These include: the resources a reader has for interaction with the text, the goal to be attained by text and reader interaction, and the ways a teacher can make a text friendlier in a classroom situation.

Barrow, L. (1990). **Elementary Science Textbooks and Potential Magnet Misconceptions.** School Science and Mathematics, vol. 90 no. 8, December, 716-720.

This is a discussion of a study conducted for the purpose of determining which magnet concepts are found in various science textbook series, how the concepts are presented, and identify potential magnet misconceptions. The results showed that coverage of magnet concepts is highly variable from series to series and most were introduced as prose.

Herron, J. (1983). **High School Chemistry Textbooks: Form and Function - A Symposium.** Journal of Chemical Education, vol. 60 no. 10, October, 888-890.

This article discusses what research says about textbook construction and how these research findings should influence the development of chemistry texts. Research has shown that publishers and teachers do not always have the same idea of what should be included in a text. The author examines this research and discusses important factors that should be included in chemistry texts.

Calfee, R. and Chambliss, M. (1988). **Beyond Decoding: Pictures of Expository Prose.** Annals of Dyslexia, vol. 38, 242-257.

The authors discuss the specific sources of difficulty in technical writing and distinguish between content structure and text structure. The article presents the building blocks for expository writing and techniques of text design as well as describing and contrasting American science and social studies texts with those of Japan. The authors conclude with suggestions for promoting comprehension of expository materials.

Pritchard, A., (1993). **A Common Format for Poverty: A Content Analysis of Social Problems Textbooks.** Teaching Sociology, vol. 21, 42-29.

This is an analysis which describes common perspectives used to explain poverty in textbooks and the relation of these perspectives to the solutions proposed to ameliorate poverty. It also provides a review of literature on the sociology of knowledge. The results of this study of material on poverty showed that 32 percent of the textbooks examined offered no historical background on poverty. They were also found lacking in more current information as the 1980s recession. Finally and most important is that the authors of these texts gave no basic explanation of poverty nor did they provide a framework for future analysis. This suggests a need a framework with basic definitions and explanations in social science texts.

Maxwell, J. (1985). **The Future of Textbooks-Can They Help Individualize Education?** NASSP Bulletin, May, 65-74.

Maxwell discusses the issues concerning development and use of textbooks. He lists the assertions made by the Council of Chief State Schools Officers and the National School

Board Association at a meeting in July 1984. Two of these are discussed in some depth; "Readability" and "Contradictions". The author suggests that the readability formulae used to choose proper textbooks should only be one factor of many in that choice. The contradiction comes in when publishers try to please everyone when producing a text. There are too many contradictory ideas about how textbooks should be written. Therefore Maxwell proposes a balanced approach which means everyone must compromise and the students must be allowed to analyze the books themselves in their search for truth.

Britton, B. and Gulgoz, S. (1991). **Using Kintsch's Computational Model to Improve Instructional Text: Effects of Repairing Inference Calls on Recall and Cognitive Structures.** Journal of Educational Psychology, vol. 83 no. 3, 329-345.

The goal of this study was to link a computational psychological model to instructional practice. Kintsch's (Kintsch & van Dijk. 1978; Miller & Kintsch. 1980) reading comprehension model was used to identify locations where inferences were called for in a 1000-word expository text. Then each location was repaired to produce a principled revision. In an experiment with undergraduates, free recall of the principled revision was much increase over that of the original version. Also, the author of the original text and 7 subject-matter experts provided measures of the shape of the original text's intended cognitive structure. The author's and experts' cognitive structure shapes correlated above .5 with the shapes provided by the students who read the principled revision but only .1 with those who read the original version. Apparently, the principled revision carried out the author's intentions better than had the author's original text. It is concluded that Kintsch's model can be used to improve instructional text.

Chambliss, M. and Calfee, R. (1989). **Designing Science Textbooks to Enhance Student Understanding.** Educational Psychologist, vol. 24 no. 3, 307-322.

This article presents an approach to textbook design based on concepts from cognitive psychology, comprehension research, and curriculum theory. The critical elements are coherence in the content and in the rhetorical patterns and devices for connecting these elements. The authors present the results of a cross-cultural study of fourth-grade textbooks from Japan, Singapore and the United States. These results show that even though all three countries' texts had strengths and weaknesses the Japanese and Singaporean books are closer to Whitehead's ideal, "teach a few things well"(Whitehead, 1929, p. 2). These results indicate that well-designed science textbooks can enhance student understanding.

Calfee, R., and Chambliss, M. (1987). **The Structural Design Features of Large Texts.** Educational Psychologist, vol. 22 no. 3&4, 357-378.

A framework for analyzing the structure of large expository texts is specified, based on notions from the rhetoric. Rhetoric books used to teach freshman composition classes have been surveyed for common patterns, and two separate text structures have been identified. One is the "functional" structure, which helps the reader construct a coherent mental representation; the other is the "rhetorical" structure, which organizes content. The framework specifies elements and linkages for the two structures that typically are presented

in the well-designed text. The usefulness of the framework is demonstrated with the analysis of a sample text, *Modern Rhetoric* (Brooks & Warren, 1972). This article concludes that by identifying design features in a textbook we can improve its comprehensibility and that teaching the design features of large texts to students can enhance their comprehension.

(1985). **Synthesis of Research on Students' Ability to Summarize Text.** Educational Leadership, February, 52-55.

This article reviews summarization research and suggests ways that teachers can help students improve their text summarization skills. There are several suggestions which include a list of summarization rules to help students organize their thoughts. The article concludes that proficiency in this activity can improve when teachers model the production and evaluation of text summaries and provide feedback and extensive practice for students (Duffy 1982).

Calfee, R. & Estrin E. (1985). **The Role of Text Structure in Acquiring Knowledge.** A Proposal to the Secretary of Education.

This is a review of text materials to identify strengths and weaknesses, and to offer recommendations for the use of existing materials, along with guidance in the creation and selection of effective future materials. Central to the review are social studies textbooks from fourth to twelfth grades. Also included are basal readers and teachers' manuals. The review will examine how these support the development of comprehension skills. Both subject matter experts and practicing teachers are used as advisors to the research team.

Berkheimer, G., Anderson, C., Lee, O. and Blakeslee, T. (1988). **Matter and Molecules Teacher's Guide: Science Book, Activity Book and Teachers' Guides.** Institute for Research and Teaching, Michigan State University.

This is a teacher's guide for the science book of Matters and Molecules, a set of instructional materials about the kinetic molecular theory written at the middle school level. The complete set of materials includes a science book, and activity book, 17 transparencies, three wall posters, and teachers' guides for both the science book and activity book (Occasional Paper No. 122). The purpose of these materials is to promote conceptual change learning. When they were used in a research and curriculum development study from 1986-1988 the Matters and Molecules materials proved to be helpful to the teachers, and the students were more successful in undergoing conceptual change.

Morgan, R. (1988). **Instructional Systems Development in Third World Countries.** ETR&D, vol. 37, no. 1, 47-56.

Morgan argues the importance of system analyses in education. He suggests that without them the development of instructional systems such as radio, television, microcomputers, and videodiscs could be incompatible with existing educational systems. He sites examples of this occurring in Indonesia and Liberia. The conclusion examines a case (in Korea) where they successfully integrated the two using systems analysis prior to developing or implementing any educational programs.

Glynn, S., Yeany, R. and Britton, B. (1991). **Explaining Science Concepts: A Teaching-with-Analogies Model** from The Psychology of Learning Science. Hillsdale, NJ: Lawrence Erlbaum Associates. 219-240.

One of the most effective ways for students to integrate their existing knowledge with information from texts is through analogies. Glynn explains the Teaching-With-Analogies (TWA) model for using analogies in science courses. As an example the image of water flow is used to explain electric currents.

Glynn, S., et. al. (1989) **Analogical Reasoning and Problem Solving in Science Textbooks** from J. Glover, et. al. Handbook of Creativity. New York: Plenum.

Analogies can be used to help students understand unfamiliar concepts using images from their everyday life. They serve an explanatory function and well as a creative function which aids the students in problem solving in science. The authors express the concern that improper use of an analogy can lead to misunderstanding. They explain what an analogy is, how it works and what constitutes a good analogy. Then the Teaching-With-Analogies (TWA) and the Analogical Problem Solving (APS) models are described and discussed in the context of teaching concepts in science.

Armbruster, B. (1984). **How Is A Turtle Like A Frog?** American Educator. Summer, 14-17.

This critique of basal readers suggests that they are stilted and lifeless and not likely to stimulate a child's interest. The author uses several examples to show that shortening and simplifying text makes it boring for students and often more difficult to understand. Armbruster insists on the use of "real" literature instead of watered down versions. She contends that once the market demands more quality than quantity the publishers will supply it.

Kember, D. (1991). **Instructional Design for Meaningful Learning**. Educational Science. 20, Kluwer Academic Publishers: Dordrecht, 289-310.

Examines existing research and instructional design theories for possible guidelines which could assist educators in promoting more meaningful learning. This is meant for instructional designers or educational technologists in preparing or advising on pre-prepared or packaged instruction. The guidelines focus on the importance of self-discovery of knowledge rather than on the accumulation of information. This emphasis on the deep approach to learning suggests diagnostic questions as a means of exposing existing conceptions. Providing challenges to misconceptions will cause disequilibrium, which is necessary before students are able to reform existing conceptions.

Jones, B.F., Friedman, L., Tinzmann, M. and Cox, B. (1984) **Considerate Graphic Texts. Content-Driven Comprehension Instruction and Assessment: A Model for Army Training Literature**. Alexandria, VA: Army Research Institute.

The authors argue that graphics are text and should therefore be considered in the debate for considerate texts. They contend that the graphics should have both relational (unified and coherent with the prose) and internal (internally coherent and audience

appropriate) considerateness. Using examples of inconsiderate as well as considerate graphics, the article demonstrates the contrast between the two presentations and how they effect learning.

Rubin, A. (1982). **What Can Readability Formulas Tell Us About Text?** (Contract No. HEW-NIE-C-400-81-0030), National Institute of Education.

Readability of a text, that is how easy or difficult it is to read, is calculated using various formulas which measure the difficulty of words and sentences. The result of this mathematical formula is a number which indicates the grade level of that text. While these formulas are currently being used quite a lot there are many problems with them. The technical problems, misuse and cultural and class bias of these formulas call into question their value as measures of texts. This paper argues for abandoning these readability formulas in favor of a more integrative approach to selecting texts. This approach involves educated opinions and intuition on the part of teachers and field testing on the part of publishers.

Abraham, M., Bross Grzybowski, E., Renner, J. and Marek, E. (1992). **Understandings and Misunderstandings of Eighth Graders of Five Chemistry Concepts Found in Textbooks.** Journal of Research in Science Teaching, vol. 29, no. 2, 105-120.

Discusses the findings of a study designed to determine the misconceptions of eighth graders concerning chemistry concepts, how is reasoning ability related to this, and how effective are textbooks in teaching these concepts. The results showed that textbooks further the misconceptions of students and fail to teach a reasonable understanding of chemistry concepts.

Okamoto, Y., Calfee, R., Varghese, S., and Chambliss, M. (1987). **A Cross-Cultural Comparison of Textbook Designs**, Presented at the AERA conference in Washington DC.

Addresses the quality of textbooks by presenting a conceptual framework for text design. "The well designed text should have clearly discernable elements linked together according to an overarching theme." This must be true of both the organization of the text as well as its content. The authors used these criteria in analyzing science and history texts from the U.S., Japan, and Singapore. Their analysis looks at the whole book, division, chapter, and section levels of design.

Farr, R (1986) **Textbook Selection and Curriculum Change**, The Journal of State Government.

Explores the fact about textbook selection. Textbooks have a large impact on the quality of education. Most textbook selection committees focus on comprehensiveness, level of difficulty, curriculum, and bias (religious, ethnic, sexual etc.).

Lockheed, M., Vail, S. and Fuller, S. (1986). **How Textbooks Affect Achievement in Developing Countries: Evidence From Thailand.** Educational Evaluation and Policy Analysis. Winter, vol. 8, no. 4, 329-392.

Analyzes data from a national sample of eighth-grade mathematics classrooms in Thailand and explores the effects of textbooks and other factors on student achievement gain. The results indicate that textbooks may affect achievement by substituting for additional postsecondary mathematics education of teachers and by delivering a more comprehensive curriculum.

Graesser, A. (1993) **Questioning Mechanisms During Tutoring, Conversation and Human-Computer Interaction**. Sponsored by Office of Naval Research, Cognitive Science Program (1142CS).

One-to-one tutoring is more effective than alternative training methods. This project explored two examples of the dialogue patterns between tutor and student: graduate students tutoring undergraduates in research methods, and high school students tutoring 7th graders in algebra. Teaching strategies, feedback mechanisms, question asking and answering, and pragmatic assumptions were analyzed during the tutoring process. One pervasive dialogue pattern was a five-step frame: 1. tutor asks question, 2. student answers question, 3. tutor gives short feedback on answer quality, 4. tutor and student collaborate to improve on answer quality, and 5. tutor assesses the student's understanding of the answer. Tutor questions were primarily motivated by curriculum scripts and the process of coaching students through examples, rarely by attempts to diagnose and correct the student's individual knowledge deficits.

Duran, R., Goldman, S. and Smith, M. (1989). **Academic Text Features and Reading in English as a Second Language**. Sponsored by Office of Naval Research, Cognitive Science Program, (1142CS).

Several general text characteristics can have significant impact on reasoning and comprehension. These were examined together with strategies ESL students' employ when learning from text. First the literature on these strategies and how they might interact with formatting and linguistic conventions in text. Three classes of discourse-level phenomena are then described and illustrated with examples from typical college texts: topic development and background knowledge, subordination, and logical connectors. The authors suggest several ways in which these potentially impact ESL reading strategies. For example; a student with less background knowledge of the subject may need to expend more effort and have more difficulty integrating text information into an underlying knowledge.

Bovair, S. and Kieras, D. (1989). **Toward a Model of Acquiring Procedures from Text**. Sponsored by Office of Naval Research, Personnel and Training Research Programs, (1142CS).

The processes of acquiring procedures from text are important to understand for both practical and theoretical reasons. This paper outlines a theory of procedure acquisition that is based on empirical and theoretical work on the value of production-system representations for procedural knowledge. The key process in acquiring procedures from text is thus constructing an adequate set of production rules from the textual input. The existing empirical literature is interpreted and criticized within this framework. Two general conclusions are

that the amount of research on text that is intended to convey procedures is much less than the topic deserves, and future research needs to more precisely distinguish the different processes involved in acquiring procedures from text.

Goldman, S. and Duran, R. (1979). **Answering Questions From Oceanography Text: Learner Task and Text Characteristics**. Sponsored by Office of Naval Research, Personnel and Training Research Programs, (1142PT).

Seven college students enrolled in an introductory oceanography course read and answered questions on two selections drawn from their textbook in the course. Three nonnative English speakers and four native English speakers described what they were doing to answer the questions. Students also varied in level of expertise based on their backgrounds in related science courses. The questions varied in terms of their relationship to the text and the type of processing required to answer them. A model of question answering from academic texts is proposed and this model guided analysis. Solution strategies were abstracted and indicated predicted effects of question type on difficulty and on solution strategies. Differences between individuals were related to domain expertise and to language background.

Vaughin, S., Shay Schumm, J., Johnson Niarhos, F. and Daugherty, T. (1993). **What Do Students Think When Teachers Make Adaptations?** Teaching and Teacher Education. vol. 9, no. 1, 107-118.

Explores high school and middle school students' perceptions of their teachers adaptations to accommodate the individual needs of their students. Additionally, achievement and social alienation were examined to determine the extent to which these variables relate to students' perceptions of teacher adaptations. Overall, students preferred teachers who made adaptations; however, item analyses revealed that students find some adaptations more desirable than others. Students felt positively about many adaptations that promote learning, but preferred that no adaptations be made to textbooks and materials, tests, and homework. While students' perceptions followed the same overall pattern for low and high achieving students, those student who preferred adaptations demonstrated significantly higher reading and mathematics achievement scores. Students who felt less socially accepted were more likely to view favorably teachers who made adaptations. Students' comments about teachers who make adaptations indicate that they perceive these teachers as better able to meet the individual needs of students, caring and understanding, and willing to provide extra help.

Finley, F. (1982). **An Empirical Determination of Concepts Contributing to Successful Performance of a Scientific Process: A Study of Mineral Classification**. Journal of Research in Science Teaching, vol. 19, no. 8, 689-696.

Students' abilities to use science processes effectively may be greatly influenced by their knowledge of relevant concepts. The central objective of this study was to determine the extent to which each students' knowledge of concepts relevant to mineral classification influenced their ability to classify minerals. A second objective was to determine which concepts are most influential. students were tested regarding their ability to classify minerals

correctly and their knowledge of mineral hardness, cleavage, luster, streak and the logic of the classification scheme. Results showed that 58.7% of the variance in correct mineral classification was accounted for by students' knowledge of relevant concepts. Mineral hardness and cleavage were particularly important. These results suggest that students' knowledge of relevant concepts substantially influences their ability to perform the science process of mineral classification. Also mineral harness and cleavage should be emphasized during instruction. Another implication is that the presently used conception of science processes as being independent of conceptual knowledge needs to be examined and researched further.

Levine, J. and Schneider, W. (1989). **Feedback Effects in Computer-Based Skill Learning.** Sponsored by Office of Naval Research, Cognitive Science Program, (1142CS).

Investigates how performance feedback in a computer based training environment affected students' acquisition of cognitive skills requiring substantial practice. College students worked on category-search or electronic troubleshooting tasks; problems were presented, responses recorded and performance feedback was given using microcomputers. The authors studied the impact of receiving information about (a)temporal trends in one's own performance and (b)temporal trends in both one's own and others' performance. In regard to intrapersonal feedback alone, there were different types of "absolute" performance information assessed in how it affected students' learning. Results showed minimal effects in this manipulation. In regard to joint intrapersonal and interpersonal feedback, different types of "relative" performance information was assessed in how it affected students' learning. Here, evidence revealed that the type of feedback students received influenced how well they perform. It was suggested that the impact of intrapersonal and interpersonal feedback will be affected by the amount of practice time needed to achieve proficiency. Feedback may have a larger effect with extended training periods representative of normal classroom instruction.

Anderson, C. and Smith E. (1983). **Transparencies On Light: Teachers's Manual.** The Institute for Research on Teaching, East Lansing, Michigan.

A teacher's manual to be used with 13 transparencies shown as illustrations in this manual. It is to be used in conjunction with the light unite from the fifth grate textbook Exploring Science, to expose and change common student misconceptions about light. The manual helps teachers do this with: 1. an introduction describing how to use the transparencies, 2. illustrations of the transparencies and a commentary contrasting common student answers with correct or "textbook" answers and 3. tables contrasting common student misconceptions about light with scientific goal conceptions.

Roth, K. (1985). **Food For Plants: Teacher's Guide.** The Institute for Research on Teaching, East Lansing, Michigan.

A teacher's guide used in the research project Science Textbooks and Student Learning. It is designed to assist teachers in changing students misconceptions of how plants get their food. It is to be used together with Science Curriculum Improvement Study (SCIIS) activities. In the project the text was used by one teacher in her three fifth grade classes.