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ABSTRACT

Marginal and other intratext notations (gloss) can be used as an instructional technique to direct readers' active attention to (1) places in text where the application of specific skills would be appropriate (either for teaching or for encouraging the application of specific skills), (2) instances where a particular strategy could be useful for extracting meaning, and (3) key words and ideas. While glossing offers an effective way to deal with specific skills, its focus should be broadened to include the more general strategies that efficient readers use to understand text. Gloss activities should be directed toward enhancing the understanding of specific text content even as they shape the development of skills and strategies for generalizing. The effectiveness of gloss activities that claim a dual focus on content and process must ultimately be demonstrated by a specific effort (content directed) as well as a more general effort (process directed). Attention must also be given to the complex and interacting constraints and considerations of the learning environment, and any possible need for "excursions" either to augment information in the text at hand or to enhance the learner's skills and strategies. (HOD)

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Research into Practice:
Improving the Understanding of Textbooks

A Paper Prepared for the University of Indiana
Reading Conference
June 12, 1981

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My letter of invitation to this conference says:

"The conference is planned to bring school district teachers and administrators the best research and development ideas in reading education."

It says "the best," so I'm flattered to be here. (That means I'm working cheap.) More important, I'm pleased to be able to share with you some of my ideas about research and development related to reading education. But rather than simply tell you about the most recent research and development work I've been involved in, I'd like to tell you how we got interested in the first place and I'd like to share some of the doubts and some of the dreams we've had along the way. (When I say "we" I mean, primarily my associates at the Wisconsin R & D Center and me.) What I propose to do is to present and comment on selections from papers we've prepared over the last year or so. That's the best way I could figure out to really share some of the things we've been thinking about.

Last November we sponsored a conference on "Understanding Expository Text." We got into that because we felt that much of the current work by cognitive psychologists may prove to be relevant to our concern for helping students understand their content area textbooks. But we had some feelings of discontent as we approached the conference. We described those feelings like this:

"Toto," Dorothy said, "I have a feeling we're not in Kansas anymore."*

In order to proceed in the manner of practitioners of our trade we ought to try to clarify Dorothy's feelings. How did she appear to feel, how did she aspire to feel, what was her capacity for feeling, how do we

*Inspired by The Wonderful Wizard of Oz by L. Frank Baum.

feel she should feel and, as an afterthought, how does she really feel? But, being reading specialists, we could only conclude that Dorothy is dyslexic and, consequently, manifesting the disorientation that accompanies hemispheric imbalance and neurological neuroses. But, professionalism aside for the moment, we do feel that we felt like Dorothy as we began to plan the conference that became the substance for this book. Not exactly starry eyed, but most certainly vaguely discontented. Not quite like illegal aliens, but surely like interlopers in a strange and exotic land.

I'll get back to the conference later. For the moment, I just want you to know that the life as a researcher-developer is not an easy one. We saw ourselves in a Never-Never Land, trying to listen at once to the siren songs of the cognitive psychologists and to the anguished cries of the non-comprehenders. This is how we put it in a paper prepared for the 1980 meeting of the American Reading Forum:

The studies from cognitive psychology offer a rich--but largely untapped, in any systematic, integrative sense--reservoir of facts, implications, and direction for developing instructional procedures designed to enhance learning from text. I should like to suggest that it is up to reading educators to provide the systematization and integration that precedes application in the classroom and in the real world. If reading educators don't do it, nobody will.

Now please don't misunderstand. I know the challenge is an old one. For at least a millenium we educators have been lamenting the gap between "research" and "application." But generally the lamenting has been about as sincere as the wailing of paid mourners. The realities of the tenure

system and the folkways of the craft effectively force a choice of RESEARCH or PRACTICE. There is virtually no incentive and consequently, very little inclination to make an earnest commitment to translating research results into instructional practice. Those who choose not to make a clear choice are likely to develop a schizoid style: one set of behaviors in the company of researchers and another, essentially unrelated set of behaviors in the company of practitioners. But the stark fact is that it is very difficult to live with one foot in each camp and virtually impossible to exist in the no-man's land between them.

You see how complicated things have come to be: We've moved from Never-Never Land to No-Man's Land, which appears to be rather like that strange-and-exotic land we interloped after a quick stop in Oz. But as I've said, a researcher-developers' life is not an easy one. Let me tell you how we came to be where we were. This, again, is from the editors' introduction to the conference book.

From our observations in elementary school classrooms and interviews with school personnel, we were satisfied that teachers who have appropriate materials and procedures can teach, and their students can learn, specific comprehension skills. But we were troubled that these same teachers seldom offered their students explicit instruction or directed practice on how to apply the skills in reading tasks outside of formal reading instruction. The teachers were aware of a problem, too, and they expressed their concern in at least three ways. First, some wondered whether the skills students learn either in skill-centered instructional groups or in their basal reader groups were likely to be applied in real-life reading. Second, some worried because their students were having difficulty understanding content-area texts.

And finally, but optimistically, many were asking for specific suggestions on how to help their students make the transition from learning skills to applying them when they read content-area materials.

As we perceived it, the problem is not that "teaching skills in isolation," which is a fact of life in much formal reading instruction, precludes any sensible application, as some critics suggest. To the contrary, the very practice of identifying specific skills and focusing instruction on those skills is what makes it possible to "teach" reading comprehension, as contrasted to providing ancillary aids like questions or advance organizers, which often amount to little more than temporary crutches. In our view the problem is not so much one of basic instruction as of sensible application: few teachers help their students apply basic reading skills once they have been developed and few students apply them spontaneously in content-area reading. Our inclination, then, was not to abandon skill-centered teaching, but to seek ways to provide the help students need in order to make effective use of the skills they acquire through developmental teaching. We like the LaBerge and Samuels (1974) notion of automaticity, and we wanted to find ways to help teachers bring their students to a level of automaticity in applying comprehension skills as well as word attack skills.

These are some of the thoughts that occurred to us as we began to contemplate the problems related to skill-application:

- . Perhaps if we would teach the application of skills in context both students and teachers would be less inclined to view them or to let them remain in isolation.

- . If we could get students to think about--to be aware of--the skills they have while they read, they might be more inclined to develop useable, transferable, more personal skills. They might be more inclined to develop those skills to a level of automaticity. And wouldn't they be better off with such personal skills than with the teacher-directed aids that are often provided but almost never internalized?
- . If we would encourage students to make active use of the skills while they read they might turn out to be more inclined to use them on their own. Ultimately they might even begin to score better on general as well as specific tests of reading comprehension.'

In other words, we thought that by doing a better job of actively involving students in their own reading performance we might be able to help them become more independent and effective readers in all curriculum areas.

Even as we began to form some common sense notions as to how we might proceed, we were becoming familiar with an extensive body of research, most of which is not aligned with or directed toward reading education per se, that appeared to be relevant to our concerns. We noted that many investigators have devised and examined different ways to help students learn from reading: prequestions, postquestions, interspersed-questions, advance organizers, cognitive maps, marginal notes, and objectives, to name but a few examples. Other investigators have begun to examine the

text and the readers' specific and general knowledge in order to better understand the interactions between readers and texts. They have come up with text analysis routines, schemes for examining and sometimes for enhancing readers' knowledge structures, and procedures for describing readers' understanding of their own reading-related behaviors. Steeped in all this promising research, Sandy finally said, "Somewhere over the rainbow, bluebirds fly. Birds fly over the rainbow, why then, oh why, can't I?"*

And so, taking our observations in the field, our common sense based inclinations, and the promise of certain lines of research into consideration, we began to plan the conference and this book.

So there we were, ready to host a conference of cognitive psychologists in the hope that they might help us bring to bear some of their deep and incisive insights in solving one of our most perplexing problems as reading educators: How to help students understand their textbooks. We were attempting to act as facilitators: go-betweens in the twilight zone that separates research from reality. But that's only part of it. In our attempt to act as facilitators we had also begun to develop an instructional technique for use by classroom teachers. Some of the issues related to those efforts are described in the paper for the American Reading Forum:

In our attempt to act as facilitators, my associates and I settled on the notion of developing an instructional technique that we hope will help to improve comprehension--not just what we know about comprehending. We

*Coincidentally, these are lines from a song by E. Y. Harberg and Harold Arlen, "Over the Rainbow," that Dorothy sang after she had made her way from Baum's book to MGM's movie, The Wizard of Oz.

described our purpose in an article for Reading Psychology, ". . . on the basis of our observations in the field, our fantasies of how things could be, and our present perceptions of the related research, we have begun to develop procedures for glossing expository text. To oversimplify, we are using marginal and other intratext notations--gloss--to direct readers' attention while they read. Instead of relying on traditional adjunct aids like questions or advance organizers, we are attempting to direct readers' active attention to places in text where the application of specific skills would be appropriate (this could be for the purpose either of teaching or of encouraging the application of specific skills), to instances where a particular strategy could be useful for extracting meaning, and to key words and ideas. In other words, we are attempting to share mature readers' perceptions of and insights into the reading process with developing readers. We expect to make use of a wide range of techniques and activities, including traditional adjunct aids and study strategies. What we hope to do is to systematize our glossing procedures so they can be used with confidence, both formally, in the preparation of instructional materials, and informally, in face-to-face teaching in the classroom."

Recently, in the course of our work, we had occasion to prepare a position statement. While it won't tell you much about the specifics of glossing, I hope it does tell you something about where we're coming from and where we're headed. This is it:

As we view the present scene, there is, on the one hand, a clearly recognized need for techniques that teachers can use to help students understand content-area texts; and, on the other hand, an extensive and rapidly expanding body of

research and theory that promises to yield facts, implications and directions for developing the needed instructional techniques. The work we are proposing--development of a glossing technique--places us squarely in the middle, for we expect to seek implications for application in the existing research and theory as we develop the technique. We think that the middle is a viable position for teacher educators, for it provides opportunities to build much needed bridges.

We are, then, committed to the middle position, where we attempt to expedite the translation of research and theory to classroom application. This commitment is the basis for four decisions which, in turn, shape the planning of our work.

First, our approach to developing the glossing technique is eclectic. (We would even go so far as to say it is, at least at this early stage, deliberately atheoretical). In other words we are not attempting to develop the glossing technique in line with a particular theoretical position--or to extend any particular line of research. To the contrary, this eclectic stance leads us to seek implications from an array of relevant, or seemingly relevant, work. For the moment we are confining our search to promising areas of cognitive psychology--schema theory, memory development, text analysis, adjunct aids, metacognition, study strategies and text processing. We readily acknowledge the relevance and promise of other areas--sociolinguistics is a prime example.

But even as we restrain ourselves from wild grabbing, we do not claim expertise, as teacher educators, in such an array of subareas of cognitive psychology. Hence, last month we hosted a conference on Reading Expository Text. The conference was one attempt to extend our personal perceptions in a systematic way by seeking the insights of qualified others. We expect to continue to seek the advice and criticism of specialized scholars.

Second, the glossing technique is deliberately "global" in nature. That is, the technique subsumes a variety of activities that address such diverse things as (a) development and/or application of specific skills and strategies, (b) the amplification or clarification of content, and (c) the internalization of skills and strategies. Of course "global gloss" is messy, both when it comes to specifying exactly what gloss is or how to gloss a text and when it comes to designing studies that show exactly which activities do or don't enhance which readers' ability to understand expository text. But if gloss is to embody the integrative feature we are seeking, it must necessarily address, simultaneously, (a) the techniques and strategies involved in the reading process, (b) characteristics of a given text, and (c) the facts and concepts of a given content. Once we can reliably put together gloss that "works" (i.e., enhances understanding of text) with identifiable individuals or

groups, then we can devise studies to find out why it works.

In other words, we think that for now it is important to synthesize to take what common sense and informed analysis hold to be promising and intuitively devise a technique that is credible and useful to both teachers and students. Once we have that we will analyze to find out what works best and with whom.

Third, we expect to develop two sets of guidelines for glossing expository materials: guidelines for informal glossing, which teachers can use on a day-to-day basis with the textbooks in their content-area classrooms, and guidelines for formal glossing, which we can use to develop prototype materials for demonstration, instruction and study. We expect the two sets to be similar in intent and substance; but, at the same time, they will differ in detail and application.

Ultimately, teachers need guidelines that they can use informally to help students understand content-area texts. Consequently, we want to describe the glossing technique (or, probably more properly, techniques for glossing, for we expect that certain specific techniques will be more effective with certain individuals and groups) in terms that teachers can use informally to gloss content-area texts. Of course such guidelines will not, and should not, give the definitive direction of, say, a set of specifications

for creating a computer program. They should, however, be a melding of such things as (a) facts about the skill and strategy aspects of gloss that work best and with whom (e.g., that activities which focus on application specific skills are most helpful to poor comprehenders; that activities which focus on inference-points in a text are most useful to readers who have a good background of related content knowledge), (b) practical procedures for analyzing and dealing with characteristics of text (e.g., organization; concept-load), (c) consideration for students' background knowledge related to a given text, and (d) sensitivity to the need for helping students move toward internalization of the skills and strategies that are demonstrated and developed through glossing. In other words, we look toward a set of guidelines for teachers that is rooted in facts and tempered by feelings that come from an awareness of situational constraints and considerations.

Concurrent with the development of guidelines for teachers, we expect to develop prototype gloss for demonstration and study. This means that we must develop more formal guidelines for glossing materials. Such guidelines should also be useful to publishers, both in preparing adjunct materials for content-area text and in preparing instructional materials designed to improve students' general skills and strategies for understanding expository texts. The goal

we set for "formal gloss", insofar as its instructional applications are concerned, is to help readers move from a stage where they rely on gloss to assist their understanding to a stage where the skills, strategies and insights they have acquired are internalized and self-sustaining. In other words, formal gloss should go beyond "providing crutches"--which is the case with most adjunct aids, and text modifications--to "effecting cures" (i.e., not merely improving comprehension, but improving readers' ability to comprehend.)

That's what we said. We put ourselves in that vast and formidable no-man's land between research and practice. And, in effect, (you can judge whether in folly), we said that we would attempt to act as mediators, giving attention to some finite yet significant set of implications from the research side and to some clearly perceived and significant set of concerns on the practice side. A cynic might say that we put ourselves in an extremely vulnerable position, inviting pot shots from both sides! On the other hand, one might say that we put ourselves in exactly the right position, as teacher educators, to perform a most vital and useful function.

Meanwhile, we had the conference on Understanding Expository Text. I'll not attempt to summarize the substance of those papers--the book will be out early in 1982--but I can say that the papers had a dominant theme: Look to the interaction of reader and text. Walter Kintsch put it like this: "Meaning...is the result of an interaction between a text and a comprehender. The purpose of our models is to describe this interaction,

or at least some salient aspects of it." And most of the other conference papers embellished the reader-text interaction theme. We summed up in the editors' epilog as follows:

Practitioners are not likely to be overwhelmed by the insightfulness of an acknowledgement that a text-reader interaction is important to understanding expository material. Common sense suggests as much. But with a positive stance one can view the acknowledgement as evidence of (1) an essential sensitivity that appears to have been lacking in much of the compartmentalized research of the past, and (2) an inclination to begin to tackle some of the complex theoretical, methodological, and practical difficulties that reside at the point of interaction.

We invited three teacher educators to prepare formal reactions to the conference papers. In general, their papers present variations on the reader-text interaction theme of the conference. Again, we summed up in the editors' epilog as follows:

Rebecca Barr, for example, said that few individual level considerations, such as the knowledge structures of particular students, guide teachers' selection (and, implicitly, their teaching) of expository materials. In other words, although the need for a reader-text interaction is likely to be readily acknowledged, the kind of painstaking analysis that would enhance the conditions and the quality of the interaction are not so readily performed. Of course there are compelling reasons why, in the day-to-day press of keeping school, this is so. Barr put it this way:

"It is difficult to determine whether the heavy reliance on textbook materials and total class instruction that pervades content area reading is an adaptive response

to the problems of teaching diverse groups of students or is itself a source of problems. It is clear that teachers are as much preoccupied with involving their students in prescribed curricular work as they are with having them learn. Indeed, classroom management often appears to take priority over goals of learning, simply because it is the means through which learning is accomplished."

A major challenge is, first, to come to a better understanding of why present practices prevail and, then, to seek ways to enable teachers in the classroom to deal more realistically with the facts of a reader-text interaction.

Marianne Amarel approached the interaction a bit less explicitly, yet forcefully, then she pointed out the increasing need for an interlocutor as a developing learner moves from (a) inner speech, to (b) external speech, to (c) written text, which amounts to "speech without an interlocutor, addressed to an absent or imaginary person or to no one in particular." She elaborated: "As a 'sole source' of cues needed for the construction of meaning, the textual form calls for a more deliberative, more analytical posture on the part of both writer and reader of text, than is the case in constructing and reconstructing meaning in an oral context." One can infer that a good teacher could, or should, serve, at least for a time in the developmental sequence, as interlocutor, thereby enhancing a productive interaction of reader and text. Ultimately, of course, each reader must be his/her own interlocutor.

In acknowledging the interaction, Harry Singer also pointed out an important limitation of attempts to deal with it:

"Since the comprehension of any text represents an interaction between the text and the reader, and since any representation of text is selective, can there be a reliable and valid way of representing a text that will be appropriate to use for evaluating the comprehension of all readers of a passage? Or, is accuracy of understanding a relative matter that allows for a 'permissible band of interpretations reflecting varying degrees of reader-based and text-based processing' . . .?"

Singer's point is, in a sense, a rounding out of Barr's point that proper consideration of the reader must involve individual level attention to such things as the knowledge structures of particular students. He seems to be making a worthwhile addition in saying that a text representation, to have practical impact, must be selective and idiosyncratic.

We also invited eleven people who are deeply involved in both teacher education and reading education to prepare essay-type reactions to the conference papers. The essays provide an important counterpoint to the conference theme:

While a dominant theme that revolves around the reader-text interaction is clear in the formal papers, a less dominant but persistent counterpoint comes through in the informal essays. The essayists pick up on different particulars, but the gist is an expression of concern that teachers and the conventional wisdom of teachers may be passed over too

lightly as the implications of theory and research are sought and elaborated. Eunice Askov, for example, speculates about the legitimate, but as yet unspecified, role of teachers in facilitating a productive reader-text interaction. Richard Santeusano concludes that the Directed Reading-Thinking Activity plan that has been used for years by reading teachers is supported by some theories and research presented at the conference.

Or, to put it less diplomatically, reading teachers have known for years what certain cognitive psychologists seem to be discovering only now.

In effect, the essayists interjected the teacher into the reader-text interaction. This, it seems to me, is an extremely important addition, for in the context of schooling teachers must continue to play an important role in 'improve students' understanding of textbooks. In our efforts to develop--or at least to refine--the glossing technique, we are attempting to give concurrent attention to reader, text, teacher...and more. This is our most recent discussion of gloss and glossing:

Reading educators' traditional alternatives for improving students' comprehension of expository text have been either to (a) modify text, (b) augment text, or (c) modify students' reading behavior. Each alternative has been subjected to extensive study and development, but together they share a common flaw: their focus is too limited. Emphasis is placed either on the text (i.e., how it can be made more "readable" or more "comprehensible"), on the teacher (i.e., teacher-directed activities), or on the reader (i.e., reader-imposed behaviors or strategies); and there is little inclination to pay attention to the interactions among all three. Yet the clear message of the literature, the expressed concerns of teachers

we know, and our own observations and common sense is that attempts to improve readers' comprehension of text must have concurrent regard for the text, the teacher--or, more realistically, the entire instructional milieu--and the reader. To have optimal effect, then, an instructional technique ought to give concurrent consideration to

- . the background, abilities and short- and long-term needs of the reader
- . the resources of the instructional milieu
- . the characteristics (i.e., facts, concepts, structure, organization) of the text.

In other words, the technique would not only look to but go beyond the reader-text interaction that looms so large in the conference papers.

It would serve an integrative effect.

With such a prescription in mind we are working with a technique that involves the use of marginal notes and other intratext notations to direct readers' attention while they read. We are using the terms "gloss" and "glossing" to designate and describe the technique. Of course neither the idea nor the term "gloss" is new. Both have been around at least since medieval times, when theologians used gloss to elucidate the scriptures. What we hope to do is to systematize glossing procedures so they can be used with confidence, both formally, in the preparation of instructional materials, and informally, in face-to-face teaching in the classroom.

Instead of relying on traditional adjunct aids like questions or advance organizers, we are attempting to direct readers' active attention to places in text where the application of specific skills would be appropriate (this could be for the purpose either of teaching or of encouraging the applica-

tion of specific skills), to instances where a particular strategy could be useful for extracting meaning, and to key words and ideas. In other words, we are trying to share mature readers' perceptions of and insights into the reading process with developing readers...

When we first began to consider the notion of glossing as an instructional technique, we thought of it mainly as a means for, first, developing and, then, encouraging the application of the specific comprehension skills we had identified in our earlier work. Some examples of specific skills we have worked with are (1) determining the central thought of a paragraph or of several paragraphs, (2) using context clues to figure out the meaning of an unfamiliar word, and (3) identifying relationships in order to make a conclusion. We still believe that glossing offers an effective way to deal with specific skills; but as we have examined related research and interviewed students, we have been convinced that we need to broaden our focus on skills to include the more general strategies that efficient readers use to understand text.

One example of a general strategy is consciously relating new information, as it is read, to one's prior store of knowledge or to information that was acquired from reading the preceding pages. Such a strategy is suggested in a variety of sources, which include the work related to schema theory, work by Smirnov and by Brown in the area of cognitive development, Kintsch's work on developing his model of comprehension, and the line of research related to readers' mathemagenic behaviors. The usefulness of such a strategy is supported by our observation when we asked students to describe what they do when they read to understand. Some of them said that they relate what they read to what they already know or to what they had read

previously. Another example of a general strategy is the practice of self-questioning, which is suggested by several investigators who are interested in metacognition. Again, we also found in our interviews with students that some of them use self-questioning as a rehearsal strategy for remembering as well as for assessing and monitoring their own understanding of what they read.

Through gloss activities we hope, first, to help more students become aware of the usefulness of these and other strategies and, second, to help them learn how and when to employ these strategies as they read content-area material.

Although we are mainly concerned with the process of reading content-area texts, we recognize that we cannot focus on process without considering content as well. Consequently, in addition to broadening our process focus to include strategies as well as skills, we acknowledge the need for a dual-focus on content and on process. While no reading specialist can claim to be expert in every content field, principles of text analysis can be applied to materials that were written by experts. With such techniques as mapping, outlining, and the more formal text analysis techniques described by Kintsch, Meyer, and others, important content can be identified and attended to with gloss activities. In other words, we believe that gloss activities ought to be directed toward enhancing the understanding of specific text content even as they shape the development of "generalizable and internalizable" skills and strategies. The effectiveness of gloss activities that claim a dual focus on content and process, then, must ultimately be demonstrated by a specific (content directed) as well as a more general (process directed) effect: improved understanding of the glossed material

and internalized skills and strategies that enhance readers' ability to tackle any reading task.

Up to this point we have said that glossing text ought to have an integrative effect and that gloss must have dual foci, which direct attention to matters that are related to process and to content. If the preceding sentence sets parameters for glossing, then the remaining task is to elaborate, clarify and refine those parameters to a point where reliable procedures for preparing effective gloss can be specified. We are pursuing that task...

The content and process aspects of the dual focus flow toward the finished product: gloss (text augmented by gloss activities)... As the dual foci direct attention to both process and content, attention must also be given to (a) the complex and interacting constraints and considerations of the learning environment, and (b) any possible need for "excursions" either to augment information in the text-at-hand or to enhance the learner's skills and strategies. First, some comments on the excursions; then the constraints and considerations.

Excursions. By "excursions" we mean instruction that is offered in addition to the regular gloss activities provided for a specific text. On the process side, an example of an excursion is the kind of instruction offered to a reading skill-development group, where a given skill or strategy is taught intensively and in relative isolation. The purpose of such instruction is to introduce and to sharpen the learners' awareness of the skill or strategy. We are attempting to design gloss activities that assist acquisition as well as application of specific skills and strategies, but we

expect that certain readers and/or certain texts will require intensive preparation before particular skills and strategies are stressed in glossed text. (In fact, we suspect that the introduction and sharpening of most skills and strategies is most effectively handled in the manner described here as an excursion. Whether this is so remains to be seen. Meanwhile, the question of when and how acquisition can best proceed to application--insofar as the main thrust of instruction is concerned--is an important one.)

An example of an excursion on the content side is instruction that is designed to provide basic background information or to elaborate or augment given information in preparation for reading a given selection of text. Again, we expect that certain readers and/or certain texts will require additional information as a precondition to working effectively with glossed text. Of course the question of when an excursion is called for and when an anticipated lack of background information can be handled with gloss is another important one. It seems almost certain that if gloss gets bogged down with too much basic information it will become cumbersome and sluggish, thereby losing both its appeal and its effect.

For the moment, excursions permit us to acknowledge the likelihood that on certain occasions--yet to be more fully understood--it will be desirable to offer intensive instruction that is related to but not a part of the gloss that is prepared for given texts.

Constraints and considerations. The constraints and considerations we have identified so far--Expectations, The Milieu, The Reader, and The Text--are aspects of a complex teaching-learning process. All of these aspects deserve consideration when gloss activities are prepared. Furthermore, if gloss is to have the desired integrative effect, it is equally important

that concurrent consideration be given to, at least, the most potent factors. Yet the reality is that the universe of factors is virtually limitless, so an important part of the task of establishing guidelines for effective glossing is to identify the ones that are likely to have the greatest impact in given situations.

The nature of gloss activities must, of course, be shaped by the explicit and implicit expectations that can be identified. That is, the effectiveness of gloss will be largely determined by the extent to which it is in line with and contributes to the attainment of expected outcomes. Both the goals of the overall curriculum and the stated and unstated objectives of content-area teachers need to be considered to give the gloss direction and focus. The specific measures to be used in assessing outcomes also merit careful consideration, since we know that different measure may yield different results.

Consideration of specific factors in the milieu makes it possible to deal with the mundane but important matters that often make the difference between failure and success in planning instruction. One obvious factor is the time available; gloss prepared for one hour of available time would undoubtedly be quite different, in terms of degree of elaboration and types of responses required, from gloss prepared for ninety minutes or two hours of available time. Likewise, gloss prepared for individuals and gloss prepared for groups might need to incorporate different directions and different types of activities in order to sustain interest and effective involvement. And of course gloss ought always to be prepared in view of the best technology available: the most appropriate techniques applied in the appropriate manner for a particular individual or group.

Many factors related to the reader could and should be identified and clarified. Most important are the reader's prior knowledge of text content (i.e., content knowledge) and the reader's knowledge of and ability to apply specific skills and strategies (i.e., process knowledge). The preparation of gloss--and decisions about when and how to take planned excursions--will always be heavily influenced by both of these factors. Together, they are, in effect, the "givens" to which new information must be related.

Similarly, the text is a given that can, presumably, be brought closer to a match with the reader's background through glossing. To help accomplish this, important concepts and ideas must be identified through some type of text analysis; likewise, the skills and strategies a reader needs in order to understand a text must also be identified through systematic analysis. Only through reliable identification of the concepts, skills and strategies that are needed in order to read and understand a given text can we hope to specify effective guidelines for preparing gloss activities...

While the immediate focus of gloss is on both content and process, the ultimate goal is to help students not only to acquire but also to internalize and apply the skills and strategies that enable them to be independent readers of the full range of materials they encounter. Norman, Gentner, and Stevens put it like this: ". . . if a child knows how to learn, then he can get the knowledge by himself." If gloss is to contribute to that goal of independence, then we need to do more than simply provide gloss that is effective in improving students' comprehension of text. We must also provide for the systematic internalization and fading of the support that is provided through gloss in order to help students to sustain their use of the skills

and strategies when they are on their own. On the basis of our experience and observations so far, we envision four distinct levels or "stages" for preparing and for interacting with gloss activities: (1) demonstration, (2) development, (3) internalization, and (4) fading. Each stage can be briefly characterized in terms of focus and function as we see them now.

The purpose of activities at the demonstration stage is to create awareness of the different features of a text (e.g., things so mundane as chapter heads and subheads, and things so relatively esoteric as different organizational patterns and styles) and of the skills and strategies that can be used to read that particular text with understanding. The main function of the activities at this stage is to provide immature readers with models that approximate mature readers' perceptions relative to extracting meaning from text. That is, the gloss activities, or models, include reflections, queries and applications that lead students through thought processes that are similar to those of mature readers as they read and study expository texts. Demonstration gloss activities describe what is--or ought to be--happening as one reads. We hope that by preparing effective demonstration gloss we can develop students' enthusiasm for working with glossed materials. The goal is to win them over by showing them that it works and is worth the effort.

Just as demonstration gloss activities provide descriptions of what is happening, gloss activities at the development stage provide explanations that help students to develop an understanding of how to make active use of the skills and strategies they need to read and comprehend the content. As we see it now, gloss at this stage should include clarification of behaviors related to specific skills and strategies, explanation of how

to use the skills and strategies, and opportunities to apply the skills and strategies in reading content-area texts.

At the internalization stage gloss activities provide opportunities for students to continue to use the skills and strategies that were introduced and sharpened at the development stage in a wide variety of contexts. At this stage we envision activities that are designed to help students move closer to independence by helping them move toward a level of metacognition. The activities would go beyond providing opportunities for application and practice; and the focus would be on developing students' awareness of when they could apply skills to understand text and which skills and strategies might be most appropriate in different situations.

By the time students reach the final stage, fading, they will, presumably, have internalized the skills and strategies (i.e., they will have become aware of skills and strategies and be able to apply them in a variety of contexts). The function of the gloss activities, then, is simply to remind readers to think about their own efforts to understand what they are reading, to think about the skills and strategies that help them to comprehend given information, and to correct any miscues or misconceptions that may be clouding their understanding. That is, to use a term from the work in artificial intelligence, gloss activities at the fading stage should remind students to "debug" their understanding (i.e., eliminate false perceptions) as they read. Students who reach the fading stage will, essentially, have attained the goal we set: they will not only possess the skills and strategies required to read content-area texts, but they will be aware of their ability to use the skills and strategies and know when and how to apply them.

So we know about how we'd like to proceed. And even though most of us who were involved in the early work I've described to you have left or soon will leave the R & D Center, we don't expect to fade -- other than in our continued work with gloss. Meanwhile, a number of people who actually teach school are using gloss in their work with real people, students reading content-area textbooks. They say it works.