

# JOURNAL of READING

VOLUME 36 N° 6 MARCH 1993  
ISSN 0022-4103  
LB 1573.A1J68  
CODEN JRDNB3

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Founded 1957 as the *Journal of Developmental Reading*  
by the Developmental Reading Staff,  
Department of English, Purdue University

Published since 1964  
as the *Journal of Reading*  
by the International  
Reading Association

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## COVER

Reading is outdoor entertainment.  
This month's photo by Lee Snider/Photo Images.

David Reinking  
Donna Mealey  
Victoria G. Ridgeway

# Developing preservice teachers' conditional knowledge of content area reading strategies

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*Instructors of future teachers must go beyond simply presenting instructional strategies. They must show novices how to match strategies to the teaching situation.*

Teacher education programs typically offer a content area reading course for preservice teachers and some U.S. states require such a course for a teaching certificate (Farrell & Cirrincione, 1984). Such a course is arguably one of the most difficult for reading faculty to teach. The instructor faces not only the challenge of bridging the gap between novice and expert that is at the crux of all teacher education (Shulman, 1987) but also the challenge of overcoming students' resistance to content area reading instruction. At the root of this resistance lie deep-seated misconceptions about teaching and about the role of reading in the teaching of their subject area (documented by O'Brien and Stewart, 1990).

Dominant approaches to preparing teachers (see Alvermann, 1990) do not address the unique challenges of content area reading courses. Given students' resistance, Stewart and O'Brien (1989) have argued for alternatives with a focus on constraints to teaching in real classrooms. Others (e.g., Ogle, 1989) have argued for a systematic introduction to strategic teaching that will foster preservice teachers' independent decision making. Indeed, Roehler and her colleagues (see Roehler, Duffy, Herrmann, Conley, & Johnson, 1988) have concluded that a major difference between the novice

and the expert teacher is that the expert organizes knowledge differently. The expert teacher's knowledge is linked inextricably to relevant factors in the classroom.

These and similar references in the literature suggest that to meet the challenges of teaching content area reading courses to preservice teachers, instructors must go beyond presenting instructional strategies. They must relate instructional strategies to the contextual factors that affect teaching (see Hollingsworth & Teel, 1991), and they must promote independent decision making based on an analysis of specific teaching situations.

To address these issues, we have developed a model for introducing content area reading strategies to preservice teachers. In this article we describe the model, illustrate how it might be applied, and discuss its practical implications and limitations.

### **Defining the problem further**

Instructors who teach content area reading courses may be confident in their ability to familiarize their students with a variety of useful teaching strategies. However, familiarity with strategies is not enough to ensure that they will be used (Manzo, 1991). Students must be taught how to use them.

We believe that a major consideration in teaching students how to use strategies is to help them choose wisely from among the many strategies presented, by helping them select a strategy matched to a specific teaching situation. In addition, we believe that it is important to develop students' abilities to adapt and extend strategies in response to circumstances that arise during teaching. However, preservice teachers' lack of teaching experience, and perhaps their bias against content area reading instruction, militate against accomplishing these two goals.

Compounding the difficulty is that the illustrative examples presented in content area reading texts too often fail to show the ambiguity and unpredictability of real classrooms and students. Or, the examples are highly refined finished products that do not reflect the false starts and imperfect attempts that preceded them. Ideal examples may be motivational, but a steady stream of them may prepare preservice teachers inadequately for the real world of teaching.

When preservice teachers are placed in simulated or real teaching situations, we have often observed their difficulty in implementing content area reading strategies, despite their familiarity with them. Novices frequently have little basis for selecting a strategy except perhaps that some strategies may have been broadly identified as pre- or postreading activities. Consequently, they frequently experience what they consider to be failure.

Their perceived failures may be the result of selecting a strategy that is poorly matched to a particular

text or teaching situation, or their attempts to implement a strategy may pale in comparison to the idealized examples they have seen. A bad experience based on unrealistic expectations may lead some of them to conclude that a strategy is unworkable, and they are not likely to try it again. Worse, such an experience may reinforce any resistance they have to content area reading instruction in general.

In a nutshell, we believe that the central aim of teaching content area reading courses should be to help preservice teachers learn how the conditions of teaching affect the selection, use, and success of teaching strategies. This type of knowledge has been referred to as conditional knowledge (see Paris, Lipson, & Wixson, 1983) as compared to declarative knowledge (e.g., being able to define a particular reading strategy) and procedural knowledge (e.g., being able to carry out the procedures necessary to implement a strategy).

In our view declarative and procedural knowledge become important only as they relate to developing students' conditional knowledge. In other words, questions about what strategies are available and how they are implemented give way to questions about the factors that may influence the selection of a strategy and how it may be adapted to the diverse, interacting variables that inevitably complicate teaching.

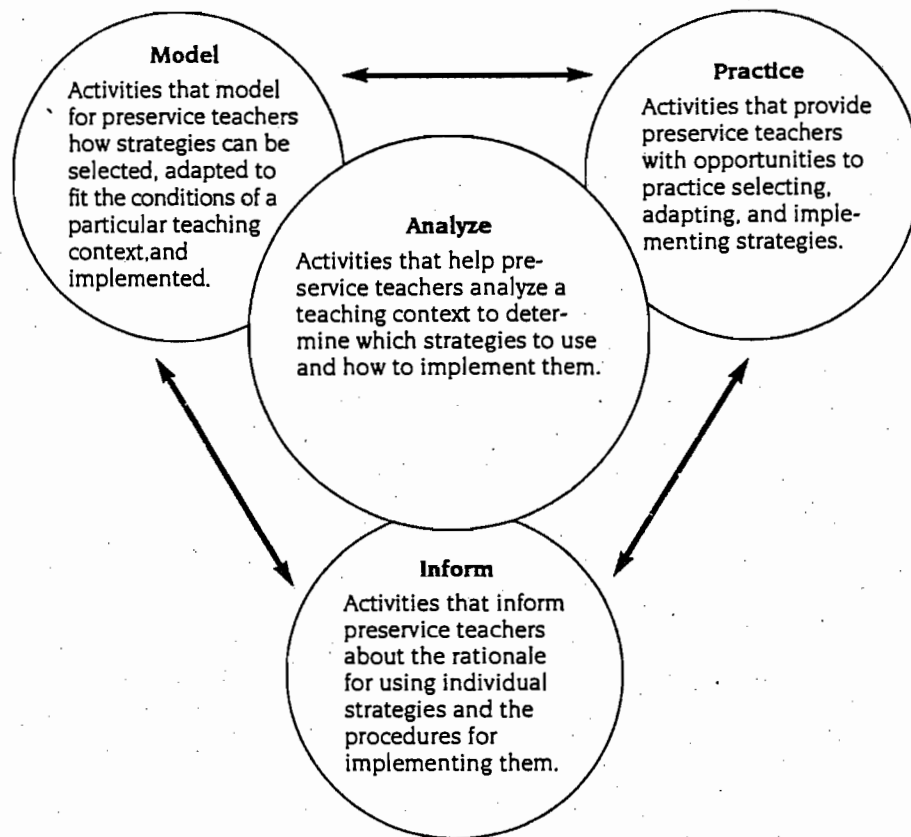
The model we are proposing has grown out of attempts to focus our teaching on conditional knowledge. We hope that teachers will choose to use content area reading strategies in their teaching and will do so effectively.

### **Overview of the model and its rationale**

The model establishes a conceptual orientation for developing and implementing instructional activities in a content area reading course for preservice teachers. The goal is to facilitate the development of conditional knowledge in addition to declarative and procedural knowledge about content area reading strategies.

Toward that goal, four domains of instructional activities are included in the model: (a) activities that *inform* preservice teachers about the rationale for us-

**Figure 1**  
**A model for introducing preservice teachers to content area reading strategies**



ing individual strategies and the procedures for implementing them, (b) activities that *model* for preservice teachers how strategies can be selected, adapted to fit the conditions of a particular teaching context, and implemented, (c) activities that provide preservice teachers with opportunities to *practice* selecting, adapting, and implementing strategies, and (d) activities that help preservice teachers *analyze* a teaching context to determine which strategies to use and how to implement them.

Figure 1 shows these four components of the model and how they are related.

Our interest in conditional knowledge has led us to build the model around instructional activities that encourage preservice teachers to analyze the selec-

tion and use of strategies by attending to relevant variables in a teaching context. Conditional knowledge is made operational when an individual can make appropriate decisions based on an analysis of prevailing conditions. Thus, the model addresses conditional knowledge by engaging preservice teachers in the analysis of a teaching context. Activities that promote such analyses are the focal point of the model.

Declarative and procedural knowledge are foundational to conditional knowledge and are also addressed in the model. Instructional activities that inform preservice teachers about strategies are aimed at developing declarative knowledge, while activities aimed at modeling and practicing strate-

gies are aimed at developing procedural knowledge. However, in the model, all of these instructional activities are approached from the perspective of analyzing a teaching context; that is, they are viewed ultimately as contributing to the development of conditional knowledge. Therefore, in the model, analysis is not only a domain of instructional activities aimed specifically at developing students' ability to analyze a teaching context, but it is also a perspective that influences the other domains of instructional activities.

For example, when informing preservice teachers about a strategy, an instructor might invite them to analyze its use relative to various content areas. When modeling a strategy, an instructor might present a rationale for its use in a particular situation based on an analysis of the teaching context. Likewise, when practicing the use of content area reading strategies, preservice teachers might be asked to articulate their rationale for using a particular strategy based on their analysis of a real or imaginary teaching context.

The pervasive influence of analysis on the other domains of instructional activities is represented in Figure 1 by a large circle overlapping the three smaller circles. The arrows connecting the smaller circles emphasize that those activities aimed at one instructional domain may also reinforce the aim of another domain. For example, a preservice teacher practicing the use of a particular strategy would also be modeling it to peers who might be observing; additionally, everyone involved in the activity would become more informed about the procedures for implementing the strategy. Therefore, although the model identifies separate domains of instructional activities, these domains are primarily conceptual; in practice a particular instructional activity may often relate to several domains simultaneously.

Additional examples of how the components of the model overlap and intersect are presented below where we give examples of the model in action.

Support for the model can be found in the literature related to teacher education. Several writers interested in increasing teachers' knowledge about reading in the classroom have called for instruction that goes beyond presenting content, advocating in-

stead a focus on relating content to the contextual factors that constrain teaching (e.g., Hollingsworth & Teel, 1991; O'Brien & Stewart, 1990), on developing strategic approaches to teaching (e.g., Ogle, 1989; Roehler et al., 1988), and on showing students how to implement strategies (e.g., Manzo, 1991).

The model also reflects the work of other writers interested in how teachers might be best educated. For example, Schon (1987) has argued that the preparation of professionals must go beyond technical training; they must "also learn the forms of inquiry by which competent practitioners reason their way in problematic instances, to clear connections between general knowledge and particular cases" (p. 39). Likewise, Doyle (1990) has argued that emerging conceptions of teacher education focus on helping preservice teachers understand the occasions in which teaching skills can be used, on applying propositional knowledge to practical situations, and on fostering event-structured knowledge. Our model also reflects the perspectives of other teaching models proposed to guide classroom teachers in explicitly teaching learning strategies (e.g., Brown, Bransford, Ferrara, & Campione, 1983; Roehler & Duffy, 1984). However, we have extended the notion of strategic learning to address the needs of preservice teachers.

The instructional domains identified in the model address these perspectives drawn from the teacher education literature. By focusing on analysis, the model addresses the contextual factors that constrain teaching and the need for strategic responses to such constraints. The inclusion of modeling and practice in the model addresses the need for experiential know-how. A concern for presenting content is represented in the model by activities designed to inform preservice teachers about strategies, but these activities are inextricably connected to the other instructional domains.

### **The model in action**

In this section we illustrate how the model could guide the development and implementation of instructional activities in a content area reading course for preservice teachers. Our intent is to explicate further the instructional domains identified in the

model by providing some concrete examples and to lay the groundwork for considering the model's practical implications and limitations.

Because the instructional domains identified in the model are interacting and overlapping conceptual categories, it would be misleading to discuss each of the components separately in a fixed order. Therefore, our illustration shows how all of the instructional domains are fluid during actual instruction. However, to make clearer the connection between the conceptual domains in the model and our description of actual instructional activities, we have italicized some key words as a signal of the model's influence.

Our example illustrates how the model might influence us as we introduce preservice teachers to strategies for enhancing vocabulary learning, a common topic in content area reading courses. To approach the topic, we might begin conventionally by assigning students to read a chapter on vocabulary in the course text or related materials. These readings would *inform* our students about a wide range of vocabulary strategies including a rationale for their use and procedures for implementing them. To guide our students' reading, we would encourage them to *analyze* whether the strategies introduced in the assigned readings would be useful in teaching their subject area.

As part of an ongoing attempt to *model* the use of various strategies, we might employ one or more strategies introduced previously to students. (See Tierney, Readence, & Dishner, 1990, for detailed explanations of specific strategies referred to in this article.) For example, they might be asked to complete an anticipation guide prior to reading, and it would be used as the focus for pre- and postreading discussions. More importantly, we would share with our students a rationale for selecting the anticipation guide in this instance. Better yet, we might ask them to *analyze* the teaching context (our course) and to speculate about why we selected an anticipation guide in this instance.

Another alternative that illustrates the model's use would be to assign a small group of students the responsibility of choosing and preparing a strategy for the class to use with a forthcoming chapter in the

text, thus allowing students to *practice* analyzing a teaching situation and implementing a previously introduced strategy.

After a postreading discussion based on the anticipation guide and perhaps some lecture material aimed at providing relevant background about vocabulary, we would further *inform* students by highlighting two or three strategies for teaching vocabulary. Given the model's focus on conditional knowledge, we prefer to present a few carefully selected strategies in depth rather than many strategies superficially. This instructional decision proceeds from the model's rationale that conditional knowledge requiring in-depth *analysis* of individual strategies is more important than declarative and procedural knowledge about many strategies. In selecting strategies we would usually look for those that are applicable to a wide range of teaching situations. For example, semantic mapping (a.k.a. list-group-label) is a utilitarian vocabulary strategy that might be highlighted.

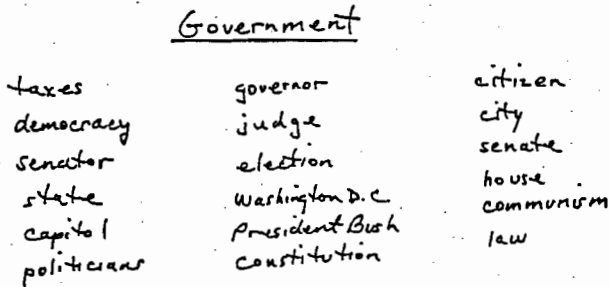
To further *inform* students about procedures for using semantic mapping and to *model* its use, we might ask students to participate in an example as we play the role of a content area instructor. For example, we might ask them to brainstorm words related to a familiar topic such as "computers" and then proceed through the steps of grouping the computer terms, labeling categories, and constructing a map.

For us, it has always been somewhat intimidating to do this modeling when our expectations for ourselves as instructors included being able to demonstrate a flawless example, which rarely occurs. We are no less susceptible to the unpredictable nature of teaching than are our students. However, when we began to see our sometimes less-than-perfect attempts to model a strategy as an opportunity for our students to *analyze* a teaching experience, we became less concerned about how well the strategy worked on any particular occasion.

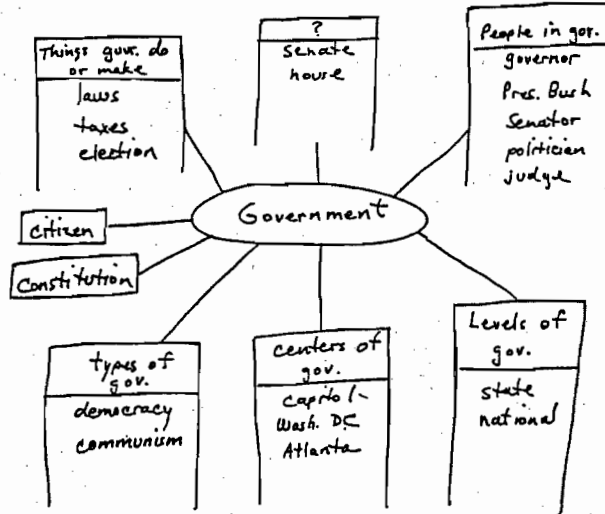
For example, what happens if the class is computer illiterate and comes up with only two or three computer terms during the brainstorming activity? Then we challenge students to *analyze* why the strategy isn't working and how the procedures for implementing it might be adapted to address the factors

**Figure 2**  
A sequence of examples illustrating how two vocabulary strategies can be adapted and linked during teaching

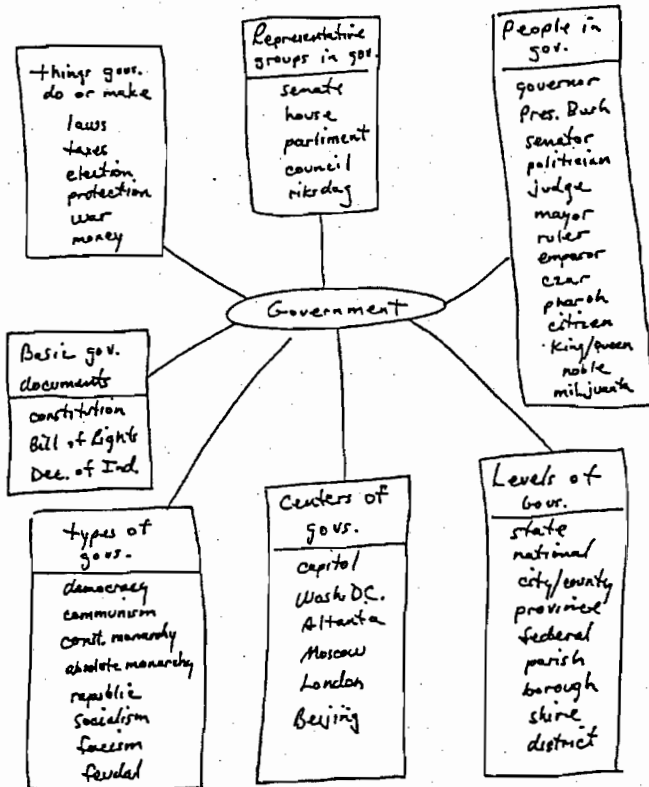
**a. Original word list in a semantic mapping activity**



**b. Semantic map using original list of words**



**c. Elaborated semantic map based on reading and small group work**



**d. Adapted semantic feature analysis derived from the "types of government" category in the semantic map**

	dictator	oligarchy	electoral	electoral	multiple parties	unintentional	ind. vs. gov.	before 1900	fringed in white
Democracy	-	-	+	-	+	N	I	?	Y
Const. Monarchy	-	?	?	+	+	Y	I	Y	Y
Absolute Monarchy	+	-	-	-	-	Y	G	Y	N
Communism	+	+	?	?	-	?	G	N	Y
Socialism	-	+	+	+	+	?	G	N	Y
Republic	-	-	+	+	+	Y	I	Y	Y
Fascism	+	-	-	-	-	N	G	N	Y
Feudal	?	+	-	-	-	N	G	Y	N

identified as problematic. Students might suggest, for example, leaving the sparse number of words on the board until after they had a chance to read an introductory article on the many uses of computers in society.

In fact, the discussion after a less-than-perfect example is sometimes so rich and productive that we have on some occasions purposefully set up a strategy for failure. When we share with students that we will use this approach, we also make them more

comfortable in participating in a critique of our teaching. For example, asking our students to participate in a semantic mapping activity based on a technical topic such as cell division illustrates the important principle that using this strategy as a pre-reading activity usually depends on choosing a central concept that is reasonably familiar to students. On the other hand, we have found that what we believe to be fatal limitations are often creatively minimized or eliminated when we engage our students in *analyzing* a teaching problem.

What better way to prepare students for their own attempts to adapt and use strategies flexibly in real classrooms than to have them help us fix our "failures"? Encouraging our students to *analyze* our instructional decisions in this way helps create the type of open atmosphere that supports an emphasis on conditional knowledge.

To *model* an advanced level of conditional knowledge in using vocabulary strategies, we could use the sequence of overhead transparencies in Figure 2 (a-d). The purpose of this activity would be to illustrate to our students how skilled teachers through their *analysis* of a teaching context could adapt the general procedures for implementing a strategy and merge it coherently with another strategy. In this case the strategies to be adapted and merged are semantic mapping and a semantic feature analysis. Thus, although the primary focus of the activity is analysis, students are simultaneously becoming more *informed* about these particular strategies.

To introduce this activity to our students, we would provide background information about a hypothetical teaching situation—in this case, an eighth-grade U.S. history or civics class in which one of the teacher's goals is to familiarize her students with the key vocabulary in a chapter on different forms of government. To add realism, we might distribute a copy of the chapter.

We would then help our students *analyze* what factors might support the teacher's decision to use semantic mapping. These factors might include the following: (a) Semantic mapping is a good activity to use when introducing a topic. (b) Government is a superordinate concept linking all of the concepts discussed in the text. (c) Government is a relatively fa-

miliar concept that should evoke some familiar associations for most students. (d) The teacher may not be sure how much students already know about different forms of government. The brainstorming step in semantic mapping will allow her to activate and probe students' existing knowledge.

To proceed with the example, we would explain how the teacher's *analysis* of the teaching situation also affects how the strategy is implemented. For example, our imaginary teacher realizes that brainstorming is a new activity for her students and that they are sometimes reluctant to volunteer responses in a whole class discussion. She divides them into small groups, each with several news magazines. Each group is assigned to find words related to government in the magazines, thus increasing the chances that students will participate actively and that a reasonable number of concepts will be generated for the activity.

We point out to our students that the results are still rather meager, as shown in Figure 2a, but we emphasize that the brainstorming would probably have failed to generate enough concepts without the adjustments based on the teacher's *analysis*. We would also highlight the more general principle that analysis resulting in even such relatively minor changes in how a strategy is implemented can greatly influence its chances for success.

Figures 2b and 2c show how the teacher might continue to adapt semantic mapping in response to her *analysis* of the teaching context as well as to developments that occur while students are engaged in the activities. For example, Figure 2b shows the class's first map based on the relatively few concepts generated during the brainstorming. Note that contrary to many textbook illustrations of semantic maps, ours has two "orphan" terms that seem to fit nowhere; the other boxes are open ended to indicate more terms are possible, or needed; and, one box has a question mark indicating that the class has not yet thought of a label for this two-item category.

Figure 2c shows a final version of the map created after students had read the chapter and then collaborated in small groups using a thesaurus and a dictionary.

Figure 2d *models* how teachers can look for oppor-



**Figure 3**  
**Factors to consider when selecting vocabulary strategies, as generated by preservice teachers in a content area reading course**

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**Instructional purposes/goals**

- Reinforcement
- Evaluation/assessment goals
- Introduce concepts
- Review
- Elaborate concepts
- Increase interest
- Enhance independent learning
- Develop reference skills

**Student characteristics**

- Background knowledge
- Academic ability
- Reading ability
- Ability to learn/work independently
- Motivation
- Metacognitive ability

**Characteristics of text**

- Organizational structure
- Purpose/genre
- Difficulty relative to student's ability/background knowledge
- Difficulty relative to subject area
- Strong vs. weak contextual information
- Considerateness
- Density of new concepts/items

**Characteristics of target words and concepts**

- Degree of relatedness
- Label vs. concept familiarity
- Concrete vs. abstract
- Connotative vs. denotative significance

**Teaching environment**

- Time available for preparation and instruction
- Small vs. large group work

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tunities to link strategies. The concepts to be compared in this semantic feature analysis are taken from the "types of government" box in the completed semantic map. Also, instead of the pluses and minuses that are typically used in textbook examples of a semantic feature analysis, Figure 2d shows that in response to specific conditions, this strategy can easily be adapted to include a broader range of symbols. In this case question marks indicate that a clear choice is not possible, I and G indicate whether the needs of the individual or government predominate (with the arrows indicating extremes), Y and N indicate yes or no, and the circled area indicates the need for further research.

We believe that such in-depth *modeling* and *analysis* clearly illustrate how strategies must be adapted to

fit a teaching context and that such activities are crucial in developing preservice teachers' conditional knowledge. Such activities also encourage preservice teachers to take a flexible approach to implementing strategies.

Embedded within our attempts to *model* the use of a strategy for our students is an emphasis on *analyzing* how the selection and use of a strategy interact with a wide range of teaching variables. At the same time, we create opportunities for students to *practice* analyzing a strategy relative to various teaching contexts.

For example, Figure 3 illustrates a list of factors that might be considered in selecting, expanding, or integrating a vocabulary strategy into content area lessons. The list is actually only an extension of a

**Figure 4**  
**A preservice teacher's analysis of a content area reading strategy**

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**Strategy analysis**

**Strategy:** List-group-label a.k.a. semantic mapping

**Key features that may affect a decision to select strategy:**

Note: See attached examples.

**Instructional purposes**

Especially well suited for an introduction to a new topic prior to students' reading. Can evolve into a study activity during or after reading, or can be used as an evaluation activity.

**Student characteristics**

Students must feel comfortable about making suggestions to a group. They must have some background knowledge about the central concept.

**Characteristics of text**

Can work with expository or narrative texts (e.g., "circus" in a story at a circus or "weather" for a chapter on meteorology). Does not work well with texts that contain a high density of unfamiliar terms.

**Characteristics of target words and concepts**

Works best when there is a key concept or topical label that unifies much of the vocabulary to be highlighted.

**Teaching environment**

Little or no preparation required. Materials are created in carrying out the activity. A computer version is available. Easily adapted to small group activity.

**Adapting, extending, and integrating strategy:**

- (a) terms in category can become basis of a semantic feature analysis.
  - (b) "orphan" words that don't fit in any category can be included in map to be expanded upon later.
  - (c) students can be asked to expand map during or after reading.
  - (d) teacher may present target words not listed by students and ask if anyone knows where they might fit into map.
  - (e) evaluation activity could ask students to draw a line between two or more items in different groups and explain how they are related.
- 

general outline generated by the class as they analyze various strategies throughout the course. In other words the only new category is the one labeled "Characteristics of target words and concepts." Our students have previously used the other categories and the factors included within them in their attempts to analyze other strategies.

For further *practice* students might be asked individually or in small groups to use this list of factors to conduct an analysis of a particular strategy such as semantic mapping. See Figure 4 for an example of a student's work. Students who will teach the same subject might also be grouped together to *analyze* the factors most relevant to their teaching and compare their evaluation to those of other groups.

To help students develop conditional knowledge, we would also look for opportunities to have them

*practice* using the vocabulary strategies in real or simulated teaching situations. A variety of activities typically associated with courses on teaching methods might be used. Field-based activities, preferably with a good deal of instructor and peer support, can be useful. Microteaching activities and case studies can also be designed to simulate the complexity of classroom environments.

However, an important ingredient in these teaching activities is that they become extensions of the analysis and problem-solving activities carried out previously in the college classroom. In this regard, students must be given ample opportunity to *analyze* and reflect upon a specific teaching situation, to adapt strategies based on this analysis, and to develop contingency plans for addressing possible developments while a strategy is being used. Students

might carry out this analysis and planning together with other students organized into small groups for support and feedback.

As can be seen in our illustration of the model in action, *analysis* continually affects each of the other instructional domains identified in the model. During all instructional activities, students are encouraged to evaluate critically the validity of a strategy's rationale as well as the logic and viability of its procedures in teaching various subject areas and topics. For example, when students are *informed* about the rationale and procedures for implementing a vocabulary strategy, they may decide that its utility varies somewhat depending upon whether the subject area is science or literature. They can become involved in helping the instructor analyze the effectiveness of strategies *modeled* for the class. Analysis is also a part of *practice* when individual students or small groups are asked to explain their decisions for selecting and implementing a strategy in a particular context and when they provide feedback and suggestions as they observe each other practicing the use of various strategies.

### **Practical implications and limitations**

The model is aimed at helping preservice teachers acquire conditional knowledge about content area reading strategies. That is, instruction based on the model is designed to help preservice teachers become adept at selecting and implementing strategies based on their analysis of a teaching context. This aim raises practical issues and limitations that must be addressed for instructors who wish to use the model in a content area reading course.

For example, how can preservice teachers be expected to analyze a teaching context when they lack teaching experience in classrooms and indeed have many misconceptions about teaching (see O'Brien & Stewart, 1990)?

We have three responses to the question. First, we do not believe that preservice teachers should be denied the opportunity to engage in analyzing teaching contexts simply because they lack teaching experience. Developing a familiarity with the process of analysis is important even if initially the process is

difficult and the analyses flawed because of naïve or inaccurate conceptions of teaching. Analysis stimulates reflection and thus lays the groundwork for productive interaction between experts and novices as they deal with misconceptions about professional practice (see Schön, 1987).

Although there is disagreement about whether teacher education should go beyond procedural knowledge, we side with Grossman (1992) who argues that there is "research [to suggest] that teacher education can provide frameworks for thinking about the teaching of subject matter that can influence what teachers will later learn from classroom experience" (p. 176). (See also Richert, 1990.)

Second, we believe that the model is more effectively implemented when instructors build into their courses opportunities for preservice teachers to become more attuned to classroom environments. For example, some course activities might involve: readings addressing the role of teachers, texts, and learners in schools; guest speakers such as practicing teachers or others in a position to talk about teaching contexts in schools; firsthand observations of and reflection about classroom teaching; discussions of written vignettes or video tapes illustrating teaching situations.

Third, instructors should recognize preservice teachers' limited knowledge about teaching contexts and gradually increase the variety and complexity of situations presented for analysis. Furthermore, the model implies that instruction in a content area reading course not be limited to didactic, instructor-centered activities. Ideally, instruction should move continually towards experiential, student-centered activities requiring preservice teachers to engage in problem-solving tasks related to classroom teaching (see Manzo, 1991; Ogle, 1989).

The model defines an important role for the instructor in providing preservice teachers with guidance and feedback during practice. However, the model's aim of developing conditional knowledge suggests that the instructor's role is not one of authoritative evaluator with answers about how to implement a strategy in every situation. The model assumes that teaching contexts are too complex and variable for definitive feedback in every situation.

Thus, an underlying assumption of the model is that an instructor will act as a coach who shapes students' development of conditional knowledge during practice by modeling expert thinking, creating opportunities for rich experiences, and focusing students' attention on relevant aspects of teaching problems (cf., Hollingsworth & Teel, 1991; Schon, 1987).

Similarly, instructors must foster an open climate in which students feel comfortable expressing their viewpoints. Such a climate is especially needed if, as we suggest in our illustration, preservice teachers are invited to analyze the instructor's modeling and use of various strategies. The documented resistance to content area reading courses suggests that such courses are susceptible to mutual misunderstandings by instructors and students creating what Schon (1987) has termed learning binds. Learning binds are characterized by a win/lose defensiveness aimed at self-protection and they can be overcome only by fostering a climate of open dialogue and honest reflection.

The role of the instructor and the instructional climate implied by the model make it well matched to newer inquiry-oriented conceptions of teacher education. Focusing on conditional knowledge achieved through analysis of teaching contexts inherently involves preservice teachers in the type of problem-solving activities typically associated with an inquiry approach to learning.

Nonetheless, the model is not necessarily incompatible with more traditional orientations where teacher education is viewed as an apprenticeship or even where it is viewed in terms of mastering specific competencies (see Alvermann, 1990). For example, if an instructor is oriented towards mastering specific competencies the model would apply if the competencies specified include conditional knowledge.

Assessment is another practical issue not addressed specifically in the model but for which the model has implications. We believe the model's emphasis on conditional knowledge should be reflected in the form and content of assessment activities. For example, a conventional final exam might consist of making available several brief chapters from various subject areas, each accompanied by a description of

a teaching situation in which the chapter might be used. Students would select one of the chapters and situations and would specify which strategies might be used. More importantly, they would be asked to provide a rationale justifying their plan for using the strategies in a specific teaching context and an explanation of possible adaptations and extensions of the activity.

More formative assessment during the course might be carried out naturally in conjunction with instructional activities. For example, individuals or small groups might be asked to evaluate each other's analyses by reacting to the activity shown in Figure 4. Or, this work might be included in a student's portfolio assembled as part of a course grade.

### **Summary and conclusions**

In this article we have outlined the difficulties associated with teaching content area reading strategies in courses designed for preservice teachers in various subject areas. We have argued that teaching content area reading strategies must be grounded in conditional knowledge instead of only declarative or procedural knowledge. Focusing on conditional knowledge helps students see content area reading strategies not as all-purpose plans for success but rather as game plans selected thoughtfully and requiring continual fine tuning and adjustment.

We believe that the model we are proposing holds promise for addressing the difficulties associated with teaching content area reading courses for preservice teachers and ultimately for enhancing the effective use of written materials in content area teaching. We have not systematically gathered any empirical data to investigate this belief. Furthermore, we are aware of no studies investigating how to improve the teaching of these courses except those already cited documenting the associated difficulties.

However, the model does respond to the calls for changes in the way content area reading is taught to preservice teachers. A number of questions might be addressed by future research. For example, would the proposed model increase students' perceptions of the course's value and would they be more likely and better able to use content area strategies in their teaching? Such questions should be of

special interest to reading educators, and perhaps it is time to examine more carefully how we can ensure that content area reading courses for preservice teachers are improving instruction in schools. Our proposed model is intended to be a stimulus for moving in that direction.

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## Preparing youth for the workplace

[We] strongly recommend that the question of where youth should be prepared for the workplace— in school, at work, or with a mixture of the two—be thought through carefully. The latest research reveals that the key issues for learning in the workplace are the same as for school-based learning: How are the work or learning activities set up? What kind of learning do they encourage? A company that organizes work, or a school that organizes learning, as a set of segmented tasks isolated from their context will limit what its workers or students learn. Whether in the workplace or the school room, what is emphasized or encouraged in the setting helps learners develop either a conceptual understanding or a highly routinized, inflexible set of responses. We argue, therefore, that the key issue is not where the learning is done, but how.

From *The Double Helix of Education & the Economy*, Sue E. Berryman and Thomas R. Bailey, New York: Institute on Education and the Economy, Teachers College, 1992, p. 11.