PEDAGOGICAL REASONING: UNDERSTANDING TEACHER DECISION MAKING IN A COGNITIVE APPRENTICESHIP SETTING

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THE PURPOSE OF THIS STUDY WAS TO DETERMINE WHAT TEACHER reflections indicate about decision making within the Reading Recovery lesson. A qualitative study was used to illuminate decision making by an effective teacher. Data were collected through think-aloud protocols and reflective journals for two children across one year. Findings indicated kinds of decisions made when mediating learning from other- to self-regulation. Multiple sources of teacher knowledge and patterns across decision making were identified. Knowledge sources were discovered to be linked to pedagogical reasoning. The intricate nature of pedagogical reasoning and decision making revealed many complexities, which facilitate the child's cognitive apprenticeship toward becoming literate.

The complexity of teacher thinking and teacher knowledge highlights the nature of teacher decision making within a cognitive apprenticeship setting (Collins, Brown, & Newman, 1989). Decision making in which teacher and child are collaboratively engaged during a lesson has been referred to as in-flight, on-line, and on-the-spot (Borko, Cone, Russo, & Shavelson, 1979; Shavelson, 1983). In the Reading Recovery tutorial setting, on-the-run is a descriptive term for the fast-paced decision making that teachers encounter when teaching for cognitive strategies (Clay, 1993a).

Given the importance of reading instruction, there is a lack of reading research which addresses teacher decision making and teacher effectiveness based on student strategy acquisition (Duffy, 1993a; Duffy & Ball, 1986). Duffy (1993a) expressed the necessity of rethinking strategy instruction if it is to become a part of instructional practice in classrooms.

Researchers within the Reading Recovery network (Bruster, 1991; Dorn, 1994; Frasier, 1991; Pinnell, 1991; Shannon, 1990) have also expressed the importance of enhancing the knowledge base of teachers to make teaching decisions when helping children become independent readers. Shannon (1990) discussed the need for Reading Recovery practitioners and researchers to know more about systematic observation and responsive teaching, to know how to increase teacher learning through interaction, and to acknowledge the role of inquiry. "We need to know more about what teachers need to know, how they make decisions, and how they learn" (Pinnell, 1991, pp. 171-172).

During Clay's (1990) address to the American Education Research Association, she stated, "At all levels the magic is not in the teaching procedures; it is in the decision-making on individual programming made by well-trained professional staff" (p. 19). This statement highlights the importance of the exploration of teacher decision making within the context of Reading Recovery. Clay (1990, 1991), developer of the program, posits that the magic of successful teaching depends upon the quality of teacher decision making.

What constitutes that magic? What cornerstones build the foundation for teacher decision making? And what are the factors that enhance the quality of decision making? It was this paradigm of inquiry that directed the focus of this research study.

Method

The purpose of this study was to explore the nature of teacher decision making and teacher thinking upon which decisions are based within a cognitive apprenticeship setting. One teacher's reflections were examined to explore the decisions made by an effective Reading Recovery teacher. The question guiding this yearlong study was:

What do the teacher's reflections indicate about decision making within a cognitive apprenticeship setting of the Reading Recovery lesson?

This qualitative study of teacher decision making focused on case literature that has been developed for presenting the intersection of content, student strategy use in reading and writing tasks, and the pedagogy of teacher decision making as suggested by Shulman (1986b) and Brandt (1992). A single case study of an effective teacher's decision making that occurred during natural segments of instruction within a cognitive apprenticeship setting of the Reading Recovery lesson provided an explanation of teacher decision making and how those decisions were supported by pedagogical reasoning.

The Teacher and Students

At the time of the study, the teacher was teaching in the program for the fifth consecutive year. She was trained during the first year of program implementation in the independent school district where she taught. Prior to her teaching in Reading Recovery, her experience included four years as a special education teacher.

She was highly regarded by her colleagues as effective in program implementation. Her effectiveness was documented by the number of children she served each year and the longitudinal data substantiating their success in regular classroom settings. In addition, Reading Recovery university trainers and teacher leaders considered her an effective teacher.

Based upon multiple data sources, she seemed to have a strong theoretical, as well as practical knowledge base. Her understanding of the importance of teacher behaviors upon the effectiveness of student performance was evident in her autobiography as well as in reflective journal entries. For example, in her autobiography she stated, "Teacher behaviors have a tremendous impact on student learning, and once unproductive strategies are learned it is very difficult to change them." This teacher was one Shulman (1987) and Brandt (1992) envisioned as the kind of effective teacher who shares a "wisdom of practice."

Data were collected on four students. However, Nathan and Jessica were students selected to report for inclusion in the case study because their programs covered the span of one academic year with one served during the fall semester and one in the spring. They were also identified as being the lowest progress readers in their class at the time of selection into the program. Nathan entered Reading Recovery at the beginning of the school year in late August. His individual tutoring program was a total of 19 weeks with 72 lessons. As Nathan successfully discontinued from the program in January, Jessica was entering the program. Jessica's program lasted a total of 13 weeks with 42 lessons.

Procedures

Data collection occurred every three weeks for three consecutive sessions or lessons across individual student's intervention programs. There were six data collection periods in Nathan's program and five in Jessica's program.

Three major sources of data were analyzed. The primary source was a think-aloud protocol about decision making during the lesson. Protocols were self-reported and audiotape recorded by the teacher after each lesson for each child participating in the

study. The teacher was asked to record reflections of her reasoning about the decisions made during the lesson. This request was considered a framework for the think-aloud protocol, but the teacher was encouraged to share any perspective regarding teacher decision making. The think-aloud protocols were collected at intervals defined by the parameters for data collection in the study, for a total of 35 protocols. The teacher's reflections were transcribed verbatim; they were analyzed at the idea-unit level for possible insights into the decision making process of the Reading Recovery teacher.

Second, reflective journal entries provided by the teacher for each child were coded and analyzed. Reflective journals offered another means of analyzing the teacher's thinking and decision making through written reflections. The teacher was asked to make an entry each week into each child's journal.

After data collection, the teacher served as the third source of data. Transcripts of interviews and interview field notes were analyzed to offer internal validity to the study. Member checks during the period of data analysis, after the initial year of data collection, provided necessary triangulation of the data. Student records and videotapes provided further clarification about decisions made for individual student programs. Detailed procedures are documented in the complete study (Elliott, 1994).

Analysis

The process of data collection and simultaneous analysis is recursive and dynamic (Merriam, 1988). It was through the constant comparative method that the analysis process evolved (Glaser & Strauss, 1967).

Each think-aloud protocol was analyzed at the idea-unit level. The idea-unit level can be thought of in terms of a word, phrase, sentence, or extended monologue for a single thought, musing, or idea.

Throughout data analysis, patterns emerged across teacher reflections. For better understanding of the magnitude of emerging patterns, a shift was made from the smaller, micro-unit of analysis, the idea unit, to a larger, macro-unit perspective which allowed the focus of analysis to shift to the large topic of discussion or concern. This unit of analysis was referred to as vignette analysis, a shift in content from one topic of discussion to another. Initial coding of categories, subsequent examples, and descriptions of emerging categories are provided in Elliott (1994).

Summary of Findings

The findings were documented by a preponderance of data from teacher reflections across two students' individual, Reading Recovery programs during one academic year. The major findings revealed: (a) five kinds of teacher decisions with supportive actions, (b) multiple sources of teacher knowledge, and (c) the existence of patterns across decision making. (See Elliott, 1994, for detailed presentation of findings.)

Teacher Decisions and Actions

Five categories of decisions (*To Prompt, To Plan, To Confirm, To Demonstrate,* and *To Hold a Tentative Theory*) were identified (Table 1). Most prominent was the teacher decision To Prompt, representing 51 percent of all teacher decisions. The decision To Prompt was given either as a question or statement to engage the child in reading or writing work, to *give it a try,* or to guide the child to initiate a problem-solving stance.

Close investigation revealed that the teacher also made decisions not To Prompt. These decisions were documented across both students' programs and were associated with the pattern of fostering independence.

Table 1
Teacher Decisions Across Cognitive Apprenticeship Programs

Teacher Decision Category	Examples Indicated By Teacher Comment
To Prompt	"Then I asked her with some questions to check the couple of consonants in there to confirm visually."
	"Also, yesterday I talked about the possibility of building with magnetic letters 'red' and 'bed' and 'fed,' but she didn't have any difficulty reading that part that says, 'and now I'm in bed with spots every place.' So I chose not to do generating or building those words. She was using the meaning of the story and I didn't feel like I needed to break it down and do that."
To Plan	"I wanted him to have an opportunity to notice the final 's' at the end for him to check."
To Confirm	"I wanted to comment to him and I did, that I was glad he was always thinking about the story."
To Demonstrate	"I modeled some slow articulation."
To Hold a Tentative Theory	"And I'll be anxious to see over the next two or three days, if his searching reflects that he's doing that more."

Decisions To Plan were made moment-to-moment within lessons as well as across lessons. They were responsive decisions planned by the teacher or made on-the-run resulting in an action or non-action. The teacher's decision to accomplish a specific task, to select specific materials of instruction, or to anticipate the child's literacy behaviors needed for future learning exemplified this category. Analysis revealed that without exception, teacher decisions To Plan were based upon teacher observation, the teacher's personal theory of reading, the teacher's personal theory of the child's responding, or any combination of this knowledge.

In the think aloud protocols the teacher not only reflected on her decisions, but also provided pedagogical reasoning and evaluation for those decisions. Such teacher behavior was especially reflected in decisions To Confirm reading and writing behaviors. Over half of the confirmed reading behaviors indicated that teaching for strategies was given high priority. Teacher decisions To Confirm represented responsive teacher decisions made to give feedback to the child. This decision praised, reinforced, or validated the child's thinking and reading and writing behaviors. These confirmations were specific to literacy behaviors observed by the teacher such as, "I complimented him on his fluency in the running record book, Buffy. On the running record, he wasn't using his finger to match, but he did seem to catch himself the four times where he said something that was not correct. He caught himself and I wanted to comment to him, so I did."

Decisions To Demonstrate revealed responsive teacher decisions made to show how and to provide examples to establish a new response, skill, principle, or procedure for the child. These decisions indicated that the teacher was closely following the child through teacher observation and providing responsive assistance through contingent teaching (Wells, 1986; Wells & Chang-Wells, 1992). Decisions To Demonstrate were either verbal, written, or in manipulative form, such as, "I decided to point out *chew* and *chase* and the *ch* chunk, and pull down the magnetic letters for her to see them."

Teacher decisions To Hold a Tentative Theory represented approximately 3 percent of all comments about teacher decisions. This decision illustrated the teacher's ability to operate with a tentative personal theory about the child's reading behaviors. Data analysis indicated that teacher decisions were coded as: (a) a teacher decisions To Hold a Tentative Theory, (b) as a teacher decision to plan to hold a tentative personal theory, or (c) as a statement of the teacher's reasoning regarding her personal theory of the child's responses. Regardless of how this notion was identified in the data, the teacher's intent was to continue observing the child's literacy behaviors in order to obtain new or additional information about the child for future decision making.

Teaching actions were associated with ways in which the teacher implemented decisions during teacher-child interactions. These means of assisting performance were identified as: (a) demonstrating, (b) confirming, and (c) prompting which was further described as questioning, linking, or instructing. These actions indicated ways the teacher mediated student learning through each child's zone of proximal development (Vygotsky, 1978). Interdependence of teacher actions for mediating student learning was documented. The teacher often provided a scaffold that combined ways of assisting student performance.

Sources of Teacher Knowledge

Multiple sources of teacher knowledge were distinguished as Knowledge of Child, Knowledge of Content, and Pedagogical Content Knowledge. These knowledge sources were discovered to be intricately linked to the teacher's reasoning for making decisions and were found to be the basis upon which decisions were made. The nature of pedagogical reasoning during moment-to-moment decision making was described through these knowledge sources. Data indicated that pedagogical reasoning was a way of thinking that facilitated discovering, formulating, and concluding based upon the teacher's multiple sources of knowledge.

Knowledge of Child included knowledge of child's individual characteristics and literacy behaviors and accounted for 31.5 percent of the three documented knowledge sources. This source of knowledge was represented by comments concerning the child's reading and writing behaviors or as statements that indicated the teacher's personal theory of the child's responses. The following reflective comment provides a clear example:

> I was also pleased that she was using meaning in her searching when she was trying to decide what the animals had eaten. She was verbalizing 'Now, what would that have been?' So I knew she was thinking about the meaning of the story.

Knowledge of Content was content specific to reading and writing and involved evidence of the teacher's understanding of ideas, facts, and concepts, and relationships associated with emergent literacy. This knowledge source represented 31.5 percent of all sources and described the teacher's personal theory of learning to read and to write. The following example duplicates the teacher's personal theory of learning to read

and demonstrates her knowledge of how language structures provide additional opportunities for new learning.

In the new book *The Chick and the Duckling*, there were a few places where searching was a challenge. For example, the text reads 'taking a walk' instead of 'walking.' This presents a new more complex opportunity for searching.

Pedagogical Content Knowledge was the teacher's understanding of her role in assisting children to read and write. This knowledge-base component supported the teacher's decisions related to the process of assisting a child to become a strategic, independent reader. Procedures specific to the Reading Recovery program were regarded as Pedagogical Content Knowledge. Also included in this category were statements about the teacher's personal theories of learning to read and statements reflecting the teacher's theory of the child's responses when stated in such a way as to reflect how to teach the child. Pedagogical Content Knowledge was reflected in 37 percent of the comments coded as teacher knowledge sources.

Patterns of Decision Making Across Time

Patterns or trends in teacher decision making were documented across time. The four prominent patterns were described as *Observation, Teaching for Strategies, Fostering Independence,* and *Decision Making On-the-Run* (Table 2). These patterns were associated with teacher decisions and teacher knowledge sources which fostered cognitive development from other-regulated to self-regulated reading and writing behaviors.

Table 2
Patterns of Decision Making Across Cognitive Apprenticeship Programs

Pattern	Examples Indicated by Teacher Comment
Observation	"When she was checking, *always* thoroughly saying it should be *a-l-l*, that's when I decided to show her the words *always, already,* and *almost* because they're all words that have that 'all' sound but are spelled with one *'l.'*
Teaching for Strategies	"On the new book, I purposely didn't tell him the stone was a stone when he went through the first time and said *rock* or *an ice cube* because I wanted him to use his beginning letter knowledge—that was one of my focuses and I figured the new book would be a real good place to do that."
Fostering Independence	"I'll need to remind myself to let Nathan take physical control of the book. I tend to take over that responsibility early on although I do it without really thinking."
Decision Making On-the-Run	"I don't think *stands on ends* is a phrase he's heard much or has ever used because that was really the only hard part. We did that several times and I had him pick any other page that he'd like to read for fluent reading instead of the whole book."

Observation, the most prominent pattern across decision making, was documented in 89 percent of the vignettes about the teacher's reflections. Teaching for Strategies was another well-defined and prominent pattern identified across instructional

programs, documented in 61 percent of the reflection vignettes. Although Fostering Independence appeared as a discrete pattern in 25 percent of the vignettes, the notion of fostering independence seems implicit when teaching for strategies (Clay, 1985, 1993a). The pattern of Decision Making On-the-Run appeared to be inherent throughout the cognitive apprenticeship setting of Reading Recovery.

The findings revealed the complexity of teacher decision making in a cognitive apprenticeship setting and uncovered some of the subtleties of ef fective teaching that researchers contend are important in understanding the often elusive and complex instructional actions in teaching (Duffy, 1990, 1993b; Pressley, Goodchild, Fleet, Zajchowski, & Evans, 1989). As the complexities were uncovered, a theory emerged concerning the teacher's instructional decision making. These complexities or intricate components of decision making which guide individual paths to literacy and foster the child's cognitive apprenticeship toward becoming literate, provide a theoretical framework for understanding decision making, pedagogical reasoning, and teaching in a cognitive apprenticeship setting.

Discussion

It is important to consider the results in light of the parameters of this study. A qualitative case study of a highly effective teacher has been offered regarding her decision making when the goal was to foster independent behaviors in beginning readers and writers.

As a part of a larger case literature, this study contributes to the growing body of qualitative research on teacher decision making which is descriptive of cognitive strategy use. It is hoped that readers interested in teacher decision making and student strategy use will access this study to best meet their own needs. Much like doctors and lawyers who develop their own hypotheses and draw conclusions based on individual cases, the readers of this case study will be offered the same opportunities (Kennedy, 1979; Walker, 1980; Wilson, 1979). Lincoln and Guba (1985) viewed case studies as opportunities for discussion of the inquiry outcomes and may be most usefully thought of as lessons to be learned. The lessons are not generalizations, but working hypotheses that relate to understanding the phenomena. Therefore, the most significant conclusions drawn from this study may be those made by readers who contemplate the findings and discussion for their own purposes.

Decision Making: An Instructional Practice

Decision making appears to be a complex instructional practice which involves making numerous decisions supported by pedagogical reasoning. The decisions made by the teacher in this study also identified the actions and interactions of teacher and child, expert and novice, in the apprenticeship setting. Ways in which the teacher mediated student learning, moving from the interpsychological to the intrapsychological plane (Vygotsky, 1978), were revealed through teacher reflections regarding decisions which parallel cognitive apprenticeship methods, modeling, scaffolding, and coaching for successful teaching in a cognitive apprenticeship framework (Collins, Brown, & Holum, 1991). Decisions were based, in a large part, on the teacher's observation of the child's reading and writing behaviors. The teacher's personal theory of what the underlying assumptions imply about the surface reading and writing behaviors supported the teacher's decision making (Clay, 1991).

Many studies have explored the notion that routines play a central role in teachers' interactive thinking (Leinhardt & Greeno, 1986; Warner, 1987). Routines are thought to minimize conscious decision making during teacher-child interactions (Borko & Shavelson, 1990). Strong evidence in the literature suggests that decision making is only changed when well-established routines are interrupted by potential problems.

This hypothesis may be true for many teachers who rely on routine instructional decisions and actions as the vehicles to move their teacher-child interactions. However, it is not substantiated by this case study. As Duffy, Roeheler, and Putnam (1987) have advocated, the teacher in this study was a decision maker who assumed personal responsibility for curriculum and instruction rather than relying on any scripted plan. Rubin's (1989) perspective on teacher thinking would applaud such an autonomous teacher acting as a "self-regulating professional" (p. 31). The wisdom of practice demonstrated by this teacher supports Brandt (1992) and Shulman (1986a), who advocated developing a case literature that focuses on the intersection of content and pedagogy, bringing together teacher decisions and student strategy acquisition in reading and writing tasks.

The teacher decision To Hold a Tentative Theory represented a small percentage (3 percent) of all teacher decisions. It may appear that this finding is not worthy of being reported; however, the researcher perceives this finding to be important. This evidence documents that effective teachers demonstrate the ability to operate within a tentative framework (Clay, 1991).

Observation: The Basis for Decision Making

Observation of the child's reading and writing behaviors appears to be directly related to the teacher's tentative personal theory building (Clay, 1991) and the teacher's ability to be *contingently responsive* to the needs of the learner from moment-to-moment and across time (Wells, 1986; Wells & Chang-Wells, 1992). The teacher's responsive nature and ability to follow the child from early sessions in the program to lessons throughout the child's program are based upon sensitive and systematic observation (Clay, 1993b).

The observational comments indicated the teacher's priority to foster strategic reading. Observational statements also revealed teacher evaluation as an important feature in this effective teacher's practice of being contingently responsive.

A unique observational comment, referred to as an *Aha!*, provides tangible evidence supporting the cognitive dissonance idea of Meyers and Ringler (1980). The Aha! comment also supports Clay's (1991) notion that careful observers obtain information during sensitive observations in order to refine their personal theories of what it is to learn to read and of the child's responses.

Greater understanding is needed about the role of the teacher's awareness brought to the conscious level in order to act upon the observation. Werstch (1985) referred to conscious awareness as a special form of consciousness regarding intellect and affect. The dynamic organization of consciousness outlined by Vygotsky (1978) recognized that inter functional relationships are characterized by constant transformation and mutual influence.

Luria (1978) stated that consciousness is a complex form of organization of activity and not an *inner state*. The current study supports this notion in that the teacher is engaged in the activity of realizing and interpreting what observations of the child's reading and writing behaviors mean about the child's underlying cognitive functioning.

Further organization of this activity involved the assimilation of knowledge into a kind of transaction during instructional interactions.

The teacher's decisions and subsequent actions may be prompted by unexpected events or observation of the child's unexpected reading behaviors. However, it is the teacher's ability to maintain a stream of consciousness during decision making that allows access to knowledge sources supporting pedagogical reasoning.

It may be important to be looking for the Ahas in our observations of children's literacy behaviors and to reflect upon the observations in such a way as to analyze what these surface behaviors indicate about the child's cognitive processes. Cognitive dissonance that is sparked by the Ahas may further the teacher's own cognitive apprenticeship *in learning from the child* the best ways to support learners moving from teacher-regulated to self-regulated behaviors.

The teacher's reflective comments offer a framework for thinking about the complexity of decision making which fosters student use of cognitive strategies when reading and writing continuous text. These reflections indicate that central to the decision making process is the teacher's observation of the child's reading and writing behaviors.

Teacher Knowledge Sources: The Basis of Pedagogical Reasoning

Intricately woven into the fabric of the teacher's reflections are her reasons for making certain decisions. Teacher comments provided a window into teacher thinking and reasoning through which intricacies of decision making were more closely analyzed. Frequently, comments offered insight into multiple sources of teacher knowledge associated with reasoning which supported decision making.

Johnson (1993) viewed theory as making sound teaching decisions on-the-run. Capturing craft knowledge as discussed by Leinhardt (1990) encompasses the totality of the action-based, situated knowledge of teaching. This study of teacher decision making documents that theory is embedded in the wisdom of practice.

The teacher's wisdom of practice was made known through instructional decisions and actions indicating her pedagogical reasoning supported by multiple knowledge sources (Brandt, 1992; Buchmann, 1980; Shulman, 1986a, 1986b; Wilson, Shulman, & Richert, 1987). The teacher's pedagogical reasoning permeated decision making, an instructional practice intricately associated with teacher actions.

Teaching for Strategies, Fostering Independence, and Observation as the basis of decision making may be linked with teacher knowledge sources: Pedagogical Content Knowledge, Knowledge of Content; and Knowledge of Child, adapted from the work of Shulman (1986b). The teacher transforms her knowledge of content into instruction as she performs teacher actions to carry out decisions (Wilson, Shulman, & Richert, 1987).

Think-aloud protocols described teacher-child interactions indicating Pedagogical Content Knowledge. These descriptions appear to be evidence of cognitive apprenticeship in action. Supporting Duffy, Roeheler, and Putnam's (1987) conclusion that *responsive elaboration* is an effective instructional component that cannot be prescribed in a static script, responsive teaching requires that teachers must reason how students are responding and decide what spontaneous, dynamic, and fluid interactional exchanges must take place. This study makes visible the process for fostering strategic reading through cognitive apprenticeship (Collins, Brown, & Holum, 1991).

The outcome of pedagogical reasoning is the power to think, to discover, to formulate, to reflect, and to conclude based upon multiple sources of knowledge. Teacher theory proved to be a significant feature in decision making, supporting Clay's ideas that through sensitive observations, teachers formulate their own personal theory of the observation and what it means (Clay, 1991). In this way, through sensitive observations, personal theory is built, adding to the teacher's knowledge sources.

Multiple sources of knowledge appear to be cornerstones of teacher reasoning. These knowledge sources are ever changing, as is the dynamic organization of consciousness in teachers who are effective in fostering independent readers. Pedagogical reasoning permeates decision making supported by the teacher's consciousness of dynamic sources of knowledge.

The Intricate Nature of Pedagogical Reasoning and Teacher Decision Making

An intricate nature of pedagogical reasoning and teacher decision making within the Reading Recovery lesson was revealed in this study. While reflecting on-the-run during lessons, teachers make many choices among numerous possible decisions, then enact those choices of specific action based upon pedagogical reasoning supported by knowledge sources. The teacher assimilates new information about the child into her existing Knowledge of Child. Almost simultaneously, the teacher considers knowledge of content in relation to the reader's emergent literacy behaviors, anticipating her next teaching moves and interactions with a particular child. During on-the-run decision making, teachers rely upon Knowledge of Content, the knowledge of what it means to learn to read, and upon Pedagogical Content Knowledge and how to transform this knowledge into instruction (Shulman & Sykes, 1986).

Synthesis of multiple knowledge sources across time provided the teacher in this study with pedagogical reasoning upon which she could quickly base her next teaching move. Engaging in this process during decision making, teaching, and reasoning, the teacher came full circle when she evaluated her teaching decisions by offering other reflective comments.

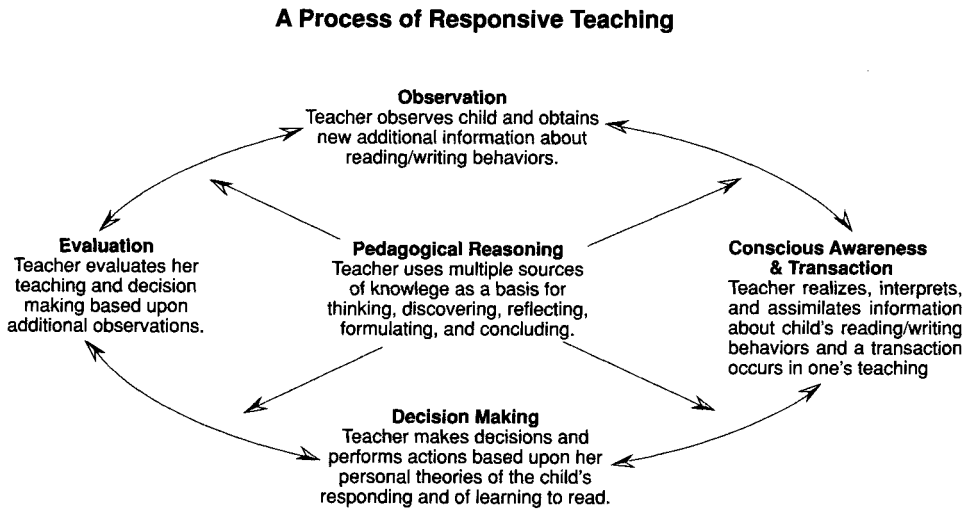
The significant work by Duffy, Roehler, and Putnam (1987) and their colleagues regarding how teachers mediate learning through their explicit, verbal explanations in teaching for strategies is supported by the findings in the current study. Duffy, Roehler, Meloth, and Vavrus (1986) identified properties characteristic of explanation to include (a) functioning in a responsive nature, (b) providing assistance, and (c) presenting information. These characteristic properties are regarded by Duffy, Roehler, and Putnam (1987) as responsive elaboration and are supported by this case study of teacher decision making.

A Process of Responsive Teaching

Data from the study led to the overarching hypothesis that an effective Reading Recovery teacher makes numerous decisions and employs the actions to carry out those decisions supported by reasoning when mediating the learning of low progress readers from other-regulated to self-regulated behaviors. Decision making within this cognitive apprenticeship setting indicates that teachers who are effective in their practice of fostering the development of a self-extending system in novice readers (Clay, 1985, 1991, 1993b) engage in a process of responsive teaching (Figure 1).

It is through engagement in the process of teaching responsively that acceleration takes place and that the magic of Reading Recovery is constituted and described.

Figure 1. **Theoretical Framework for a Process of Responsive Teaching**



Like the work of Vygotsky (1978), Rogoff (1990), Tharp and Gallimore (1988), and Wells and Chang-Wells (1992), this study supports the experts' contributions in the apprenticeship of the learner. The teacher's ability to interact in a contingently responsive manner to the learner's needs moment-to-moment and over time is essential to learning (Wells, 1986; Wells & Chang-Wells, 1992).

Though this study investigated the decision making of an effective and experienced teacher, it provides support to the findings of Lyons, Pinnell, and DeFord's (1993) study of in-training teachers' responses. While their study identified interrelated phases of learning to become a responsive teacher, this current study offers a theoretical framework indicating the complexity of the responsive teaching process. It provides an emic perspective of a responsive teacher and the process that is engaged when teaching is effective.

The process of responsive teaching can be described in terms of several features that are intricately associated with one another. Although the schema of the theoretical framework (see Figure 1) may appear linear in nature, in actuality it is multidirectional.

The responsive nature of the effective teacher allows the teacher to closely and systematically observe the child while engaged in literacy tasks. Observation is intricately linked to effective decision making which is a critical aspect in the process of responsive teaching. These findings further support the work of Clay (1991, 1993a, 1993b). Jaggar (1985) acknowledged that observation plays a critical role in teaching, indicating that it is the connective link between theory and practice. Collins, Brown, and Holum (1991) also identified observation as playing a surprisingly key role. They stated that:

> . . . the interplay among observation, scaffolding, and increasingly independent practice aids apprentices both in developing self-monitoring and correction skills

and in integrating the skills and conceptual knowledge needed to advance toward expertise. (p. 9)

As the teacher observes the child's reading and writing behaviors, new or additional information concerning the learner's problem-solving abilities on text is obtained. The teacher's awareness of this information is brought to a conscious level and realized or perceived in terms of what the behaviors indicate about the child's functioning (Clay, 1991; Werstch, 1985). Assimilation of this knowledge into the teacher's current knowledge of the child and knowledge of how children learn to read enhances one's decision making.

The process of responsive teaching must encompass an astute conscious awareness of what the surface reading behaviors imply about the child's underlying cognitive processes (Clay, 1991). Engagement in responsive teaching appears to be the essence of what Clay (1990) referred to as the magic of Reading Recovery.

Similar to the transactional theory of Rosenblatt (1988), a transaction takes place in the teacher's thinking and in subsequent interactions with the child. Based on new or additional knowledge of the child obtained through observation, the teacher now formulates a new, ongoing tentative theory of the child's responding (Clay, 1991). Meyers and Ringler's (1980) hypothesis that cognitive dissonance provides the ontogenesis of personal theory building is supported by this study.

Within the cognitive apprenticeship setting of Reading Recovery, an effective teacher demonstrated that her knowledge was continuously restructured based on observations of the child and on her personal theory of learning to read. This idea is supported by Gaffney (1993) who stated that if teaching is responsive, then the child changes the teacher. Through observational information and the teacher's theory of how children learn to read, the teacher was responsive.

A personal tentative theory based on cumulative observations is the basis of teacher knowledge sources and supports the notion of an incomplete theory (Clay, 1991). In this way, teacher observation is intricately linked with pedagogical reasoning. Observation is the heart of responsive teaching as pedagogical reasoning is the heart of decision making.

Pedagogical reasoning permeates the process of responsive teaching and provides support to the act of decision making. When engaged in making a decision the teacher accesses multiple sources of knowledge supporting the professional knowledge base (Shulman, 1986b). Based upon tentative personal theories, the teacher taps knowledge of the child's responses (knowledge of child), knowledge of how children learn to read (knowledge of content), and knowledge of how to present or represent the content to the child (pedagogical content knowledge).

The process of pedagogical reasoning offered by Schulman and Skyes (1986) is supported by this study; the teacher was engaged in transforming her knowledge of the child and her content knowledge of how children learn to read into ways to mediate learning. The transformations or ways to assist the students' cognitive development through the zone of proximal development were based on personal theory supported by multiple knowledge sources.

The reflective comments also revealed the teacher's evaluation of her teaching decisions, evaluation of the lesson in specific or general terms, and evaluation of herself. Teacher evaluation was viewed as important in the process of decision making with regard to the responsive nature of the teacher.

Responsive teaching is an ongoing, dynamic process between child and teacher. The teacher's evaluation of her own teaching and decision making is checked by

additional observations. These observations sustain engagement in the generative process of responsive teaching, once again directing the teacher's attention to observations of the child's reading and writing behaviors.

The following reflection vignette of Nathan's reading while he was attempting to regulate his own reading behaviors reveals the essence of responsive teaching.

> I like and was real excited to see, at the end of the story, when he said, 'Good sleep the farmer. I can sleep.' That he didn't look up for a minute—for a few seconds because I think he was replaying in his mind what he'd just said.
>
> And he said to me, 'Was that wrong? or 'Was that right?' And I went ahead and told him he could check and see if he wanted to.

This example provides a clear picture of the teacher's actions in carrying out her decision and her pedagogical reasoning for doing so. It further shows the delicate balance of providing assistance in the mediation of student learning from other-regulated to self-regulated behavior and describes how the teacher accomplished this responsive teaching act.

From this case study of an effective Reading Recovery teacher whose conscious decision making was not minimized by routines, it appears that the quality of decision making is directly related to the responsiveness of the teacher's interactions. Similar to Gallimore, Dalton, and Tharp's (1986) study, responsive teaching by definition requires and necessitates that *in-flight adjustments* occur "if the teacher is to assist performance in the ZPD, because it is not always possible to anticipate what ideas and knowledge students will bring to a text" (Tharp & Gallimore, 1988, p. 234).

Therefore, observation can be thought of as the heart of responsive teaching and serves as the basis for decision making during cognitive apprenticeships. Such conclusions support and extend the large body of Clay's (1966, 1982, 1985, 1991, 1993b) work on observation.

A process of responsive teaching can be identified and described in terms of teacher decisions, teacher actions, and teacher reasoning that permeates decision making. It is through the responsive teaching process that learning by novice readers and writers can be mediated from other-regulated to self-regulated behaviors and, thereby, foster independent readers and writers.

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