DOCUMENT RESUME

ED 137 774 CS 003 412

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TITLE CATTS (Computer Assisted Teacher Training System) Technology in Analyzing Observational Data from Public School Classrooms: A Study of Interactive Tactics and Decisions of Teachers.
PUB DATE Apr 77
NOTE 13p.; Paper presented at the Annual Meeting of the American Educational Research Association (New York, New York, April 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Classroom Observation Techniques; Computer Assisted Instruction; *Decision Making; Elementary Education; *Group Reading; *Interaction; Models; Oral Reading; *Reading Instruction; *Reading Research; *Teacher Behavior
IDENTIFIERS Computer Assisted Teacher Training System

ABSTRACT

Prompting of reading errors is a common pattern of teaching behavior occurring in reading groups. Teachers' tactics in responding to pupil errors during oral reading in public school classrooms were analyzed with the assistance of the technology of the Computer Assisted Teacher Training System (CATTS) to formulate hypotheses about teacher decision making in interactive teaching. An observation schedule constructed to code teacher and pupil moves in oral reading was used to gather data from 34 teachers as they taught oral reading lessons. The observed prompting tactics, variations in success rate in prompting, and data from a stimulated recall interview of teachers suggested models of teacher information processing and decision making. (Author)

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CATTS Technology in Analyzing Observational Data From Public School Classrooms: A Study of Interactive Tactics and Decisions of Teachers

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Paper presented at the annual meeting of the American Educational Research Association, New York, N.Y. Session 20.12, April 7, 1977

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The purpose of the study was to formulate hypotheses about how teachers process behavioral information and make decisions during interactive teaching. More specifically the investigator sought clues to the relative influence of various types of information on the responses made by teachers to pupil errors and difficulties in oral reading. Teacher information included: (1) features of the text to which the pupil is responding (e.g., characteristics of words); (2) the nature of the child's antecedent responses (e.g., type of reading miscue); (3) teacher knowledge of individual pupil characteristics; (4) teacher recall of past instructional events (e.g., "He had that word before"); (5) teacher beliefs about reading and reading instruction; and (6) curricular context (e.g., objectives and organization of reading tasks in the basal reader series).

Method

On the basis of extensive initial field data and an analysis of decoding problems in reading, an observation schedule was developed and field tested for recording teacher pupil interactions during oral reading--the Oral Reading Observation System (OROS) (Figure 1). OROS records categories of pupil miscues, teacher prompts, pupil responses, and teacher reinforcing and management moves in the sequence in which they occur, identifying each individual pupil with whom the teacher interacts.

Data were gathered with OROS in reading groups taught by 34 resource room and special education (EMR) teachers from the same large, urban school system. Each teacher taught a reading group consisting of from 2 to 5 pupils from the teacher's own class. Each teacher was instructed to conduct the lesson in as normal a fashion as possible, allowing each child an opportunity to read aloud. In these groups the pupils read from an unfamiliar story. Each lesson was coded on OROS into computer storage.

The observational data for each teacher were analyzed by calculating frequencies of types of miscues, types of teacher prompts, types of pupil responses (including correct word identifications following teacher prompting), and types of teacher reinforcing and management moves. Computer produced matrices show frequencies of common recurring chains of teacher and child behaviors (Figure 2). Proportions of successful and unsuccessful teacher prompts were calculated.

After the reading lesson fifteen of the teachers were interviewed using the method of stimulated recall (by playing back taped excerpts from the lesson) in order to obtain further clues to sources of influence on the tactics used by each teacher. The interview data were analyzed by accumulating examples of types of information mentioned by the teacher as playing a part in the prompting tactics (reading text features; child behavior; antecedent events; child characteristics; the teacher's own instrumental behavior; and the teacher's beliefs, hypotheses and reasoning about the tactic).

Results

Markedly different styles of interactive tactics were found. Teachers varied widely in their success in prompting, as reflected in the proportions

of correct word identifications made by pupils during the lesson. Variations among teachers in the sample can be described on the following indices: size of repertoire of prompting behaviors; stereotyping; complexity of prompting tactics; adaptiveness to specific types of reading miscues; and adaptiveness to individual pupil. The interviews revealed the variety of kinds of information that teachers report using in "deciding" on how to prompt (Figure 3).

The hypotheses suggested by the findings are expressed in some tentative models of decision making constructed to represent the range of qualitatively different tactical patterns found in the observation data and in the teacher rationales expressed in the interviews. The models range from simple 1- or 2-rule models to complex models that entail both multiple kinds of information as well as multiple value criteria (Figure 4).

Significance

How should teaching skills in oral reading be characterized? Shavelson (1973), among others, has argued that the essential skill of teaching is decision making. Atkinson's work with computer-mediated instruction in reading illustrates the complex decisions involved in a relatively simple three-track system of instruction in beginning reading. Our data suggest that some teachers make instructional moves based on decisions of considerable complexity. Panel 6 of the NIE National Conference on Studies in Teaching suggested that the relationship between thought and action is a crucial question and that the actual "ratio of reflection to reflex" is an important subject for study. The data from this study suggest that this ratio varies widely among teachers in the particular classroom activity studied.

The technology of the Computer Assisted Teacher Training System contributes

to investigations of teacher information processing during interactive teaching in several ways. The process of developing sophisticated observation instruments sensitive to the behavioral sequences unique to specific instructional tasks can proceed in a logical and orderly fashion. Second, sequential features of behavioral events can be rapidly analyzed to orient the investigator's probes into teachers decisions and uses of information. Most promising for the future is the prospect of using computer mediated feedback to teachers to modify decision strategies and to promote proactive teaching rather than simply modifying overt behavior patterns.

Category 1: Target Pupil: Exact Oral Reading

Category 2_ _: Target Pupil: Miscues

21_	Meaning Change	_ _0	No Response/Don't Know
22_	No/Low Meaning Change	_ _1	Sounding or Naming Letter(s)
		_ _2	No/Low Similarity
		_ _3	High Similarity
		_ _4	Dialect Based
		_ _5	Insertion/Omission

Category 3_ _: Teacher: Look Prompts

31_	Letter Name(s)	_ _1	Direct
32_	Spelling	_ _2	Indirect
33_	Structural		
34_	Attention		

Category 4_ _: Teacher: Sound Prompts

41_	Isolated Sounds	_ _1	Direct
42_	Sound Out Word	_ _2	Indirect
43_	Unnatural Stress		
44_	Pattern		
45_	Sounds Within Words/Phonics Rules		

Category 5_ _: Teacher: Meaning Prompts

51_	Word Meaning	_ _1	Direct
52_	Context	_ _2	Indirect

Category 6_: Pupil: Answers to Prompts

61	Incorrect Answer/Word
62	Correct Answer
63	Self-Correction
64	Exact Word/Meaningful Miscue
65	Non-target Pupil Prompts/Answers

Category 7: Teacher: Feedback and Management

71	Positive Feedback
72	Negative Feedback
73	Management
74	Turns to Another Pupil

Category 8: Teacher: Telling

Category 9: Non-Oral Reading/Other

Figure 1
The Oral Reading Observation System categories

Matrix 1

Pupil MQ

Teacher Prompt	210	211	212	213	215	222	223	224	225	Total
31_	0	0	1	3	0	0	0	1	0	5
32_	0	0	0	0	0	0	0	0	0	0
33_	0	0	0	1	0	0	0	0	0	1
34_	0	0	4	3	0	3	0	1	0	11
41_	0	0	0	0	0	0	0	0	0	0
42_	1	0	1	0	0	0	0	0	0	2
43_	0	0	0	0	0	0	0	0	0	0
44_	0	0	0	0	0	0	0	0	0	0
45_	0	0	2	3	0	0	0	0	0	5
51_	1	0	1	4	0	0	0	0	0	6
52_	1	0	0	0	0	0	0	0	0	1
71-74	0	0	3	1	0	0	0	0	0	4
8	0	0	0	2	0	0	0	0	0	2
NRS	0	0	0	2	1	0	3	0	0	6
63	0	0	0	2	0	1	1	0	0	4
Total	3	0	12	21	1	4	4	2	0	

Teacher Prompts	61	62	64	Total
31_	4	0	2	6
32_	0	0	1	1
33_	4	0	2	6
34_	2	0	8	10
41_	0	0	0	0
42_	1	0	0	1
43_	0	0	0	0
44_	0	0	0	0
45_	3	0	3	6
51_	4	0	5	9
52_	1	0	0	1
71-74	0	0	5	5
8	1	0	12	13
Total	20	0	38	

Figure 2
Sample Matrix Display of OROS Sequences During a Reading Turn
(Cell entries are frequencies)

A. Features of Text

1. Word features
   a. graphemic features
   b. phonemic features
   c. meaning of word
   d. syntactic function
   e. judged difficulty
2. Context features
   a. sentence context of word
   b. story context
   c. vocabulary of text (e.g., story based or word families)
   d. prior occurrence of word in text
   e. future occurrence of word in text

B. Instructional Context

1. Prior occurrence of word in program
2. Class's prior experiences (e.g., word drills; stories read)
3. Instructional goals, objectives, plans
4. Time constraints ("We didn't have time")
5. Other children's behavior/needs

C. Child Characteristics (Presage)

1. Ability traits
2. Personality/motivational/affective traits
3. Learning style
4. Reading habits; decoding/processing abilities
5. Reading vocabulary
6. Comprehension skills
7. Oral vocabulary/concept knowledge
8. Speech characteristics (dialect, etc.)
9. Physical/sensory characteristics (e.g., "needs glasses")
10. Prior personal experience

D. Child's Immediate Performance in the Reading Situation

1. Miscue characteristics/decoding behavior
2. Reading behavior/style (fluency, speed, etc.)
3. Attending behavior
4. Response to prompt
5. Specific interpretations of words/phrases/text
6. Social behavior
7. Nonverbal, expressive behavior
8. Affect/motivation
9. Immediately prior performance in lesson

E. Teacher's Own Behavior/Introspections

1. Available repertoire (of prompts, etc.)
2. Thought processes; rules
3. Past behavior; experience
4. Affect
5. Intentions
6. Perception of miscue ("I didn't notice"; "I misunderstood")
7. Restatement of own behavior
8. Post-hoc explanation for failure/statement of how situation should have been handled

Figure 3
Information Used in Decisions on Prompting Reading Miscues

A Typology of Teacher Decisions in Prompting Oral Reading Miscues

Key

Information Item	Aspect of Reading		
	Graphemic	Phonic	Meaning (Semantic/Syntactic)
Features of Text	a	b	c
Child's Decoding Process or Skill	k	l	m
Miscue Characteristic	p	q	r
Prompt in Teacher's Repertoire	x	y	z

Simple Rules

(Always _____, Never _____.)

Examples

Don't let a child guess.

Never break the flow of meaning.

Always tell a child the words he cannot read.

2-Element Rules

(If (1), then (2).)

Examples

If a child miscues, use prompt x (or y) (or z).

If text word has salient feature a (or b) (or c), use prompt x (or y) (or z).

If child's miscue is p, then use prompt x.

If child has decoding skill k, then use prompt x.

Figure 4

3-Element Rules

(If (1) and (2), then 3.)

Examples

If child miscues p[illegible]es not have decoding skil[illegible], then use prompt y (or [illegible].

If text word has feature a, and if prompt x activates decoding skill k, use prompt x.

If child has difficulty with feature a, and if child has decoding skill k, use prompt x.

4-Element Rules

(If (1) and (2) and (3), then (4).)

Examples

If text word has feature a, and if miscue is p, and if child has decoder skill k, use prompt x.

If text word has features a and b, if miscue includes correct decoding of a, and if child has decoding skill 1, use prompt y.

If text word has feature a, and if child has decoding skill k, but if child miscues p, then use minimal x (or use "attention" prompt).

Non-Rules

Restating own behavior.

Describing child's error.

"I thought he'd get it!"

"I wanted to help her/him."

Figure 4 (Cont'd)