DOCUMENT RESUME

ED 317 966 CS 010 014

AUTHOR Clariana, Roy B.
TITLE The Teacher Is a Variable in Reading Computer-Based Instruction.
PUB DATE May 90
NOTE 14p.
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Analysis of Variance; Classroom Environment; *Computer Assisted Instruction; Grade 1; Primary Education; Reading Instruction; *Reading Rate; Reading Research; *Teacher Behavior; *Teaching Styles; *Time on Task
IDENTIFIERS Computer Related Learning Environments

ABSTRACT

A study examined the effects of different teacher styles on one variable related to classroom learning production. Subjects, 34 first grade middle- and lower-middle income students in a Catholic school matched by ability and randomly assigned to either an authoritarian, systematic, ordered, and controlling teacher or to a "laissez faire" teacher, were timed as they completed 20 computer-based reading instruction lessons. Results indicated that high-ability students in the less structured classroom were working at a lower rate than their ability would suggest and that this effect was not observed in the highly structured classroom. Findings suggest that teaching style affects the lesson completion rate of elementary students using computer-based lessons. (Three figures and two tables of data are included.) (RS)

The Teacher is a Variable in Reading Computer-Based Instruction

by

Roy B. Clariana

MAY 1990

Editorial contact: Dr. Roy B. Clariana
Senior Training/Evaluation Specialist
Rocky Flats Plant / Training
P.O. Box 464
Golden, CO 80402-0464

voice mail: (303) 733-6073

Submitted to: ERIC CLEARINGHOUSE
Reading & Communication Research
Indiana University
Smith Research Center
2805 E. 10th street, Suite 150
Bloomington, Indiana 47408

RUNNING HEAD: THE TEACHER IS A VARIABLE . . .

The Teacher is a Variable in Reading Computer-Based Instruction

MAY 1990

ABSTRACT

This study considered the amount of time required by first grade students to complete 20 CBI reading lessons. It was hypothesized that when teacher style matched the inherent style of microcomputer learning environments (i.e. ordered and systematic), maximum learning production would occur. A significant effect for teacher style was observed, $F(1,33) = 4.325$, $p = .049$. Apparently the high-ability students in the less-structured classroom were working at a lower rate than their ability would suggest. This did not occur in the highly-structured classroom. In a computer-dense environment like this WICAT computer laboratory, the teacher's style appears to be an important variable that relates to student lesson completion. These results indicate that naturalistic CBI research in the elementary school must include the effects of teacher variables on student performance.

The Teacher is a Variable in Reading Computer-Based Instruction

MAY 1990

Nearly all computer-based instruction (CBI) software allows the learner to advance at their own pace. In much of the currently available software, self-pacing is the only variable under the learner's direct control. Pacing may prove to be a relatively stable learner characteristic, and may be part of a general characteristic approach or response to CBI (Clariana, 1989). A student's characteristic response might include such tendencies as: the inclination to select help screens or not, the need to forge ahead for the sake of moving forward or alternately to always lag behind, a desire to look back to check previously completed activities, and of course many others. Research related to correlates of rate of CBI completion and other variables could help define an individual's characteristic response.

The learning environment or climate is an important part of a person's response to a learning situation. Michael Streibel (1986) in a recent critical analysis of the use of computers in education stated: "The computer, as I will try to show, is not just another 'delivery system', but an environment that has certain values and biases associated with it" (p. 37). In a later article, Streibel (1988) summarized his views of the CBI learning environment by stating:

> "In my original article, I tried to show how computerized drill-and-practice programs reinforced an authoritarian, behavioral performance culture in the classroom and how this mitigated against the possibility of a general progressive function of schooling. That is, the computer tended to favor the conservative side of education (despite its modern appearance) by focusing on

> predefined skills and by reinforcing order, control, predictability, rational systematicity, and manageability" (p. 154).

Thus Streibel argues that CBI promotes a classroom culture that is production oriented. Students that complete more lessons are viewed as contributing more to the classroom culture. They have, in a sense, produced more instructional product. Greene (1978) states that the " . . .teacher is a central agent in a dialectical community of learning and one who forms a triadic relationship with the learner and the subject matter" (p. 140). A learner's characteristic response to CBI will involve (a) internal learner variables like reading ability, general ability, cognitive style, and idiosyncratic personality style; and (b) external variables like lesson content, presentation format, social interaction, and teacher style. Potentially any of these variables may match or mismatch. An adult teacher's relative intelligence, physical size, and experience; and the nature and purpose of most elementary schools supports Greene's contention that the teacher is the central agent in the classroom. Since an individual teacher's philosophy and style may match or mismatch the production- oriented CBI environment (Streibel, 1988), and since the teacher is probably the central agent in the elementary classroom (Greene, 1978), then teacher behaviors are an important and often overlooked aspect of CBI in the elementary school.

The present study examines the effects of different teacher styles on one variable related to classroom learning production (i.e. the rate of CBI reading lesson completion of first grade students). The assumption is that students' CBI rate of progress is highest when a teacher's style matches the CBI form (eg. controlled, ordered, systematic), at least with some types of CBI lessons.

Method

Teachers

Two first grade teachers were selected to participate in this pilot study based upon their opposite teaching styles. One teacher may be characterized as "matching" the style described by Streibel while the other teacher may be characterized as "mismatching" this style. Additionally, both teachers have at least fourteen years of elementary teaching experience and both have previously taught first grade. Teacher 1 may be characterized as authoritarian, systematic, ordered, and controlling. For example, in computer lab, teacher 1 requires her students to greet the lab manager each day in chorus, then they all sit down on command and wait for a cue before beginning work. This teacher constantly walks around behind each student and requires that when a student finishes a lesson, they wait until the teacher checks their score before progressing. Teacher 1 comments on the work either positively or negatively depending on the student's score. This teacher systematically checks students progress and will point this out to students in the classroom on occasion. Teacher 2 might be called a "laissez faire" teacher. She allows students to work on their own with minimal supervision, especially with familiar tasks. In the computer lab, the students file in quietly, sit down, and begin to work when they are ready. For example, some students delay for several minutes before starting work. Teacher 2 stands in the middle of the computer lab and waits for students to raise their hands. After a student raises his/her hand, teacher 2 moves quickly to that student. Teacher 1, who travels farther (i.e. in a circle around the lab) makes the student wait with hand raised until she comes around at her own speed. When a student finishes a lesson, they may continue to the next lesson without showing their score to teacher 2. Teacher 2 checks progress reports twice each six weeks and comments individually

and privately to students that are doing well or poorly. On the basis of these teacher descriptions, and for the purposes of this study, it is assumed that the instructional environment created by teacher 1 (now termed T-MATCH) matches the type of CBI environment proposed by Streibel while the environment created by teacher 2 (T-MISMATCH) is a mismatch.

Subjects

At the beginning of the school year, 36 first grade students were matched by ability and randomly assigned by the principal to one of the two experimental classrooms for the year. During the year, two students left school due to parent's job changes, leaving a final sample size of 34 (teacher 1, n=18; teacher 2, n=16). These students are mostly white from middle- and lower-middle income families. This Catholic elementary school enrolls students from k-8th grades. For additional demographic data see the dissertation by Kapadia (1987).

Materials

Two types of WICAT CBI lessons were considered. The first involved completing a series of pictures that tell a story (see Figure 1). These are called Reading Order and Sequence (ROS). No actual reading is involved, though the picture sequences required careful discrimination in order to "tell" the story correctly. In a ROS lesson, two pictures of a series would be shown. Three possible pictures, the correct picture plus two distracters would then be shown below the first series. The student uses the arrow keys to select the correct picture to complete the sequence. For example, one of the stories displayed this story sequence. Picture one shows an unpeeled banana, picture 2 shows the banana half peeled. The correct completion

shows the peeled banana half-eaten, while the two distracters show either a zipped-up banana or an apple core. Some students seemed to have problems with these ROS activities.

Insert Figure 1 about here

The second type of lesson involved identification of words either with two distracters or in sentences based on the sound of the initial consonant. These lessons are called Phonics, Initial Consonant (PIC). For example, the target consonant f would be shown and spoken by the audio portion of the program, then three pictures are shown which include a pair of feet, a beet, and a sheet. The student is required to use the arrows keys to highlight the picture of the feet and then press return.

Procedure

Ten ROS and ten PIC lessons were completed by each student in about three computer-lab periods during the fifth week of school. Rate scores for PIC and ROS were obtained by simple addition of individual lesson times, and are given in minutes (see Table 1), less time means faster rate. The CBI report provides lesson time-on-task data but does not include time in menu screens or transition screens.

Students were divided into two ability groups by median split based on recent Iowa Test of Basic Skills (ITBS) Reading scores. These groups are termed HI and LO.

Results

The means for PIC and ROS are shown in Table 1. These scores are the average total minutes for the twenty CBI lessons. The ten PIC lessons required 31.9 minutes (sd.= 8.1) to complete, while the ten ROS lessons required 12.7 minutes (sd.= 2.8) to complete.

Table 1

PIC and ROS Means

	PIC times		ROS times	
	HI	LO	HI	LO
T-MATCH	32.1	31.9	11.3	12.2
T-MISMATCH	32.3	31.4	15.3	12.5

(time in minutes)

Notice that the LO ability students were a bit faster (fewer minutes means faster rate) with the PIC lessons, but LO/HI comparisons are mixed with the ROS lesson. Tests of significance indicate that there was no significant difference for PIC times, but that there was a significant main effect for class teacher ($F = 4.325$, $p = 0.049$) for the ROS times (see Table 2).

Table 2

ANOVA summary table

Data File: rate 1st grade

Source	Sum of Squares	Deg. of Freedom	Mean Squares	F-Ratio	Prob>F
Between class	33.883	1	33.883	4.325	0.049
Between high low	4.678	1	4.678	0.597	0.446
Interaction	27.851	1	27.851	3.555	0.075
Error	235.029	30	7.834		
Total	301.441	33			

There was virtually 0 correlation between PIC time and ITBS-R. Correlations between ITBS-R scores and time to complete ROS lessons point out an interesting relationship. The T-MATCH class correlated negatively with ITBS-R (r = -0.37) indicating that high-able readers took less time to finish the ten ROS lessons, while the T-MISMATCH class correlated positively with ITBS-R (r = 0.36) indicating that high-able readers took more time to finish the ten lessons, which is contrary to expectations (see Figure 3).

In a study of third grade students (Clariana, 1989), boys and girls exhibited significantly different rates of CBI lesson completion, with boys working faster. In this present study, there was no measurable time difference between girls and boys.

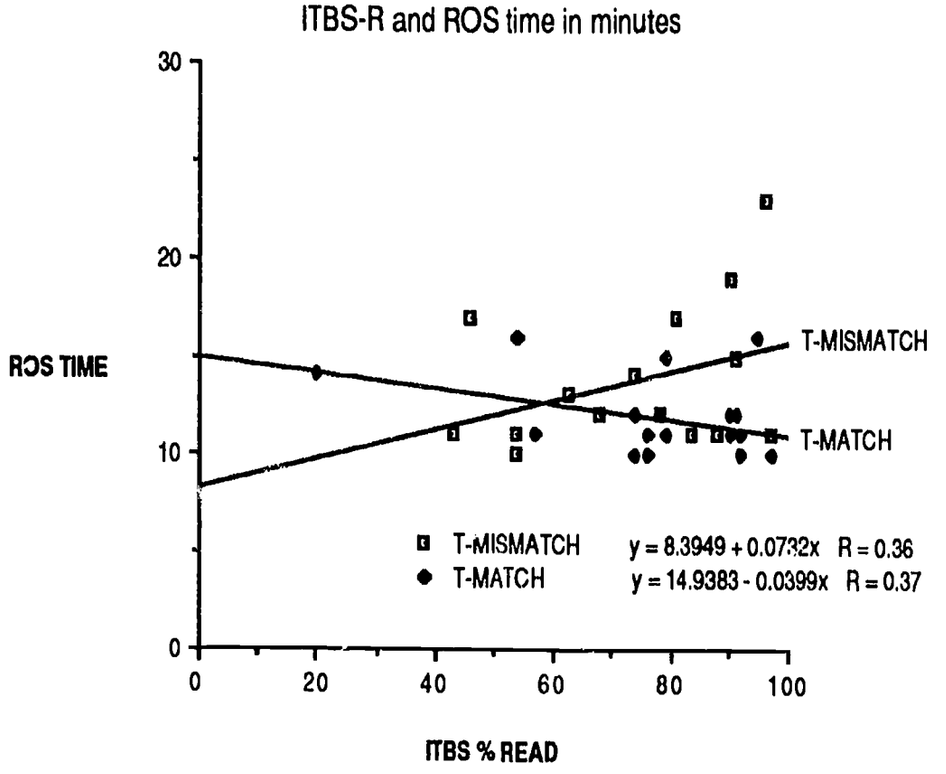


Figure 3. Correlations between ITBS-Reading and Time to Complete ROS Lessons.

Discussion

Teacher's style appears to affect the way that elementary students work on computer-delivered reading lessons, at least in terms of lesson completion rate. Students' in the T-MATCH condition worked faster. This lends support to Streibel's description of CBI learning environments. If so, then a reading teacher has an obligation to closely monitor student computer work. Performance management may be even more important in the computer lab where much of what a student does is hidden, than in the regular classroom, where performance is more obvious.

It is interesting that time differences and positive and negative correlations with ITBS-R scores occurred with ROS lessons, which required the sequencing of pictures to complete a story, while no time difference nor correlations with ITBS-R scores occurred for low- and high-ability students in the PIC lessons. This suggests that recreating the story sequence (comprehension of the story) requires as much effort or perhaps even more effort than actually reading words in order to answer a simple request. The PIC results were not significant. The PIC screens probably required less mental effort and so all students completed the required responses in about the same amount of time. Most of the PIC time variance, then, may be attributed to the relatively slow speed of the hardware rather than to individual students' response rates.

The teacher is an often overlooked variable in CBI research. At the elementary school level, the teacher may be the crucial part of the learning environment that must not be overlooked.

References

Clariana, R. B. (1990). Rate of lesson completion and achievement, sex, and report in Computer-Based Instruction. Journal of Computing in Childhood Education in press.

Clariana, R. B. & Schultz, W. C. (1988). WICAT at St. Anne's Consensus School: The second year A paper presented at the Annual Meeting of the Mid-South Educational Research Association, Bowling Green, KY. (ERIC Document Reproduction number ED ___ ___)

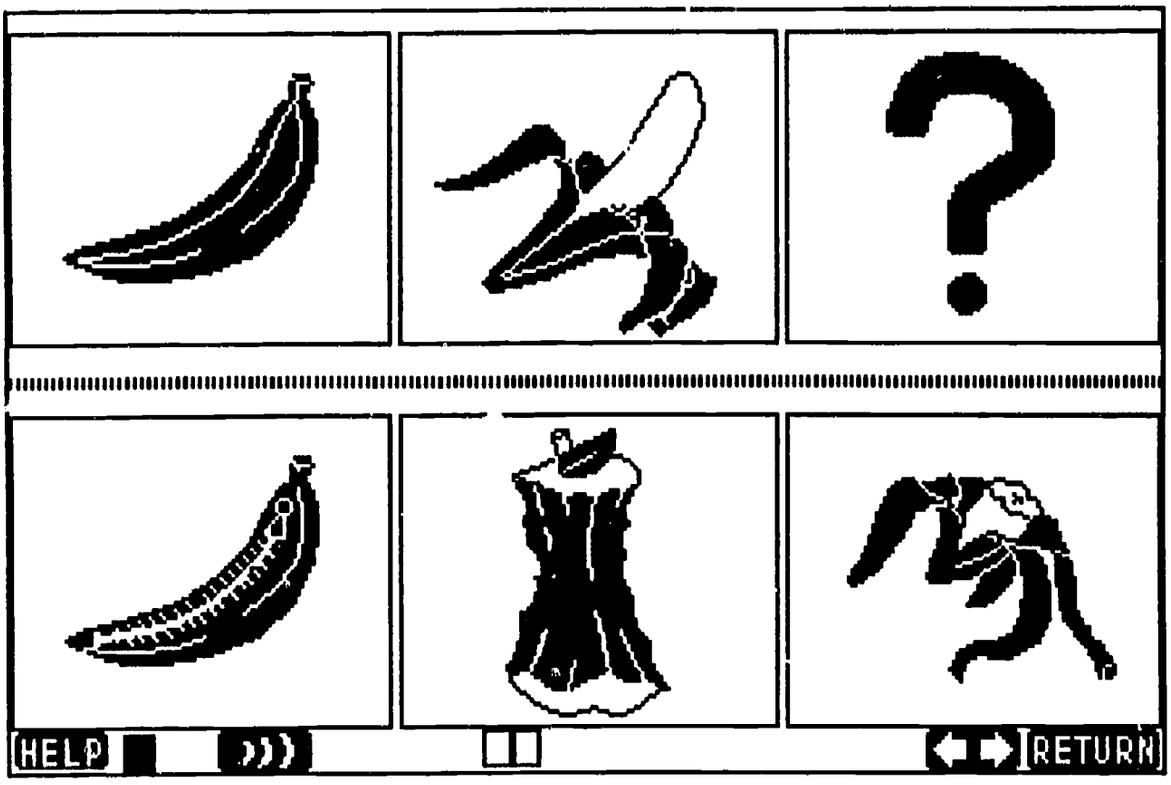
GREENE (1978)

Kapadia, M. V. (1987). The relationship between cognitive styles and achievement under computer-based instruction and traditional instruction. An unpublished doctoral dissertation, Memphis State University.

Streibel, M. J. (1986). A critical analysis of the use of computers in education. Educational Communication and Technology Journal, 34(3), 137-161.

Streibel, M. J. (1988). A response to Robert Heinich and Suzanne Damarin. Educational Communication and Technology Journal, 36(3), 153-160.

ROS screen



PIC screen

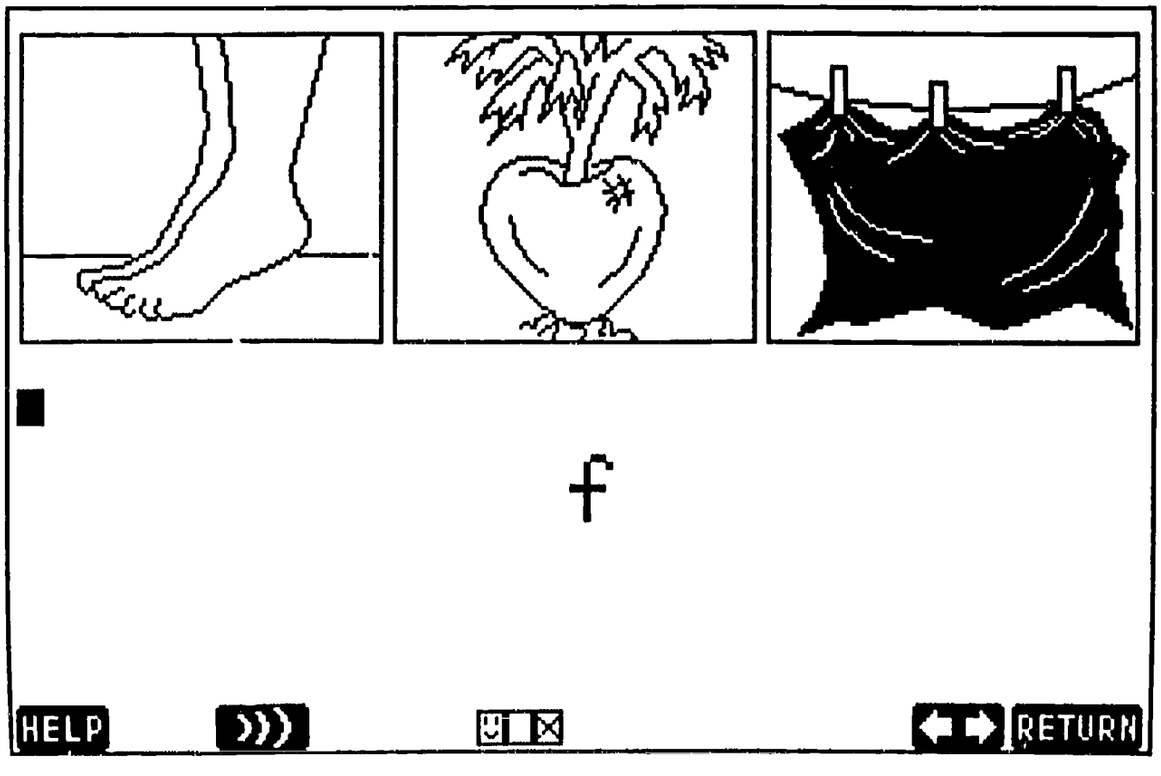


Figure 1. PIC and ROS screens.