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Educational Technology Research Section

An Exploratory Study of Teachers' Views of Knowledge Acquisition

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Abstract

This exploratory investigation examined relations between teachers' views of knowledge acquisition and their use of computers in the classroom. Using a survey instrument that assessed teachers' views of knowledge acquisition along a continuum from objectivism to constructivism, the results suggested that experienced teachers are likely to hold more objectivist views of knowledge acquisition than inexperienced, preservice teacher candidates. Teacher interviews also indicated that the realities of classroom management and/or pressures from administrators and other external sources of influence may create an environment that favors implementation of objectivist-based computer software programs rather than those that are grounded in the constructivist perspective. However, teachers' views of knowledge acquisition were not found to be associated with either (a) the likelihood they will use computers, or (b) the ways they use computers in instruction. These findings have important implications for instructional designers and curriculum reformers.

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Teacher use of technology has been vigorously researched throughout this century. From early innovations like radio and motion picture to instructional television, the teacher's role in adoption has been studied and, in some cases, assailed (Cuban, 1986; Cuban, 1989). Since the early 1980s, attention has focused primarily on the widespread adoption and classroom use of the microcomputer (Becker, 1991). Much of this research has focused on the basic question of why some teachers do and some do not use microcomputers in instruction. Research to date has traced these decisions to many sources of influence, including: (a) the adequacy of the teacher's training in computer use at either the preservice or inservice

levels, (b) the level of administrative support they are likely to receive, (c) the presence or absence of curriculum constraints, and (d) teachers' personal preferences (Beaver, 1990; Cuban, 1989; Stover, 1990; Wiske *et al.*, 1990).

This study centers on another factor that may influence teachers' decisions of whether or not to use computers in the classroom; namely, teachers' views of knowledge acquisition. Teachers' conceptions of knowledge acquisition can be viewed as a continuum ranging from logical positivism (objectivism) to constructivism. Some teachers tend to view knowledge and its acquisition from an objectivist perspective. Knowledge from this point of view is thought to exist independently of learners. Learning consists of transferring (transmitting) that knowledge from outside to within the learner (Driscoll, 1994; Lakoff, 1987). Other teachers tend to view knowledge acquisition from a constructivist perspective. Knowledge, from this perspective, exists in each learner's mind and is uniquely shaped by individual experiences (von Glasersfeld, 1989). Learning results from the learner's active construction of meaning.

The interactive nature of the computer may be especially well suited for those teachers who subscribe to the constructivist point of view. Researchers have found that computer programs that emphasize student-centered activities can successfully shift the primary responsibility for learning from the teacher to the learner. When teachers use computer software of this type, learners can (must) take more responsibility for their own learning (Berliner, 1985; Oates, 1985; Swick, 1989; Vockell, 1989; Fawson & Smellie, 1990).

On the other hand, a teacher's predisposition to view learners as passive recipients of knowledge may undermine willingness to use computers for anything other than the development of lower-order skills such as simple recall or basic comprehension. Likewise, an adherence to the objectivist perspective may also make teachers reluctant to adopt open-ended, probing, or problem-solving approaches to instruction. If so, teachers who adopt the objectivist perspective may be less willing than those with a constructivist orientation to use computer software programs that are designed to facilitate these more open-ended approaches to instruction.

The basic purpose of this exploratory investigation was to examine teachers' views about knowledge and how it is acquired, and to explore relations between those views and the amount and type of classroom time spent on computer-based instructional activities. The study was designed to address the following research questions:

(1) Do the proportions of experienced teachers with objectivist or constructivist perspectives:
   (a) differ from the corresponding proportions of preservice teacher candidates who hold these views, and/or
   (b) vary as a function of selected demographic variables such as the teacher's gender or level of teaching experience?

(2) Is there a relationship between teachers' views of knowledge acquisition and:
   (a) the likelihood they will use computers in their delivery of instruction, and/or
   (b) the types of computer software programs they will be likely to use?

Attempts to answer these two questions began with a survey of experienced teachers and preservice teacher candidates. Two alternative measures provided scores for each individual along a continuum from an objectivist to a constructivist perspective. The survey also asked teachers: (a) to estimate the amount of time they spend in their class each week, if any, on computer-based instructional activities, and (b) to describe the ways computers are used in their classrooms if any time is allocated for this activity. The design of the study also included follow-up interviews of four teachers which asked them to identify the type of software program they would prefer to use in a specific instructional context.

The findings of this study may have important implications for developers of CAI software and for curriculum reformers. Instructional designers and curriculum reformers spend many hours analyzing and supporting teachers' needs to ensure successful implementation and adoption of their products. If the adoption of CAI software is resisted when it runs counter to a collective view of how knowledge is acquired, then that view needs to be identified and addressed in the software design and in the support provided for teachers during implementation.

Method

Samples. Thirty-six teachers (23 females13 males) and 31 preservice teacher candidates (16 females /15 males) participated in the study. The members of both samples were enrolled in one of three graduate courses in secondary education offered by the university where the study was conducted (e.g., "Secondary School Curriculum Development"). Members of the *experienced teacher sample* were completing one or more of these courses as part of the master's degree program in secondary education. Members of the *preservice teacher candidate sample* were enrolled in one or more of these courses as part a post-baccalaureate teacher certification program in secondary education. This program was designed to meet the needs of students who have previously earned a bachelor's degree and who now want to earn teaching credentials.

Data provided by the preservice teacher candidates were considered in only one analysis; namely, the contrast between experienced teachers' and inexperienced teacher candidates' views of knowledge acquisition. All other analyses considered only those data that were provided by the experienced teacher sample. Table 1 summarizes selected demographic characteristics of both samples—gender, levels of teaching, teaching experience, and age.

Survey Instruments. Two survey instruments were used in this study to assess teachers' views of knowledge acquisition. The first—the *"Attitude About Reality Scale"* (AAR)—was developed and tested by Unger, Draper, and Pendergrass (1986). This 28-item scale was designed to assess college students' beliefs about knowledge and how it is acquired. The members of both samples—experienced teachers and preservice teacher candi-

Table 1. *Sample Characteristics.*

	Experienced Teachers (n = 36)	Inexperienced Teacher Candidates (n = 31)
(a) *Gender*		
Males	13	15
Females	23	16
(b) *Years of Teaching Experience*		
None	0	31
Less than one year	3	0
1–5 years	21	0
6–10 years	6	0
11–15 years	4	0
more than 15 years	2	0
(c) *Age*		
29 years or younger	15	18
30–39 years	12	9
40–49 years	9	3
50 years or older	0	1
(d) *Level of Teaching*		
Elementary (Grades K–6)	5	NA
Junior High School (Grades 7–9)	13	
Senior High School (Grades 10–12)	12	
Adult Education	6	

Note: NA = Not Available

dates—recorded their responses to each item on a seven point scale, ranging from 1 = Agree Almost Completely with the statement to 7 = Disagree Almost Completely. Scores derived from the scale reflect where an individual's beliefs fall along a continuum from constructivism to logical positivism (objectivism). Examples of survey items include:

- Who has power is a central issue in understanding how society works.
- Once a scientific fact is discovered it remains part of that science from then on.
- The saying 'You shall know the truth and the truth shall set you free' is still valid today.

In developing the conceptual framework that guided the construction of the instrument, Unger and her colleagues (1986) characterized individuals whose scores would be likely to fall at either extreme on the scale. These authors argued that those with extremely high scores would support the logical positivist (objectivist) perspective and would:

(1) show a predominant tendency to concur with statements that indicate reality is stable, irreversible, and deterministic;
(2) concur with statements indicating biological or intrapsychic (rather than environmental) causality;
(3) believe in individualistic rather than societal determination of power and status;
(4) demonstrate a general acceptance of the status quo; and
(5) believe that science as an aspect of society works well and that success is a result of merit (p.71).

On the other hand, those whose scores fall at the extreme low end of the scale would support the social constructivist position and would:

(1) show a predominant tendency to concur with statements that indicate reality is changeable and largely a matter of cultural and historical definition;
(2) believe in environmental causality of many social problems;
(3) see control by factors outside oneself as an important dynamic in the way society works;
(4) be less content with the status quo and less likely to view negatively individual efforts toward social change; and,
(5) not be convinced that meritocracy works in science as well as in other aspects of society (Unger *et al.*, 1986, p. 71).

Unger *et al.* (1986) found that students' AAR scores were related to a number of demographic variables such as age and birth order. They also found that students' orientations, as measured by the scale, may predispose them to seek college courses that are consistent with their preexistent ideology. The coefficient alpha (measure of internal consistency) of the scale reported by Unger and her colleagues for one of their earlier investigations was 0.80. The coefficient alpha of the AAR scale in this investigation was 0.82.

Despite these promising findings and indices of reliability, it is important to note that none of the items on the AAR survey focus on knowledge acquisition within the classroom context (see the examples of AAR items presented earlier). Rather, the intent of this survey instrument is to assess an individual's orientation toward an objectivist or constructivist perspective within a broader or more generalized social context. The predictive validity of this instrument may, therefore, be somewhat limited in addressing the specific objectives of this study.

With this concern in mind, the first author developed a pilot version of a scale that focused directly on students' acquisition of knowledge within the classroom context. The intent of this three-item instrument known as the *Knowl-*

edge Acquisition in the Classroom Scale (KAC) is to assess teachers' orientations toward the objectivists' or constructivists' perspectives within the specific context of classroom instruction. The three items in the pilot version of the KAC scale were:

- It is the teacher's job to 'pass on' knowledge to their students.
- Teachers should not correct student errors, but rather should allow them to 'find their own way.'
- Students are uniquely qualified to manage their own instruction.

When completing the KAC survey, members of both samples—experienced teachers and preservice teacher candidates—recorded their responses to each item on the seven point scale used in the AAR Survey. However, scores derived from the KAC scale were treated as a separate dependent variable and were considered independently from scores on the AAR scale throughout the data analyses. Because the KAC scale is still in a preliminary stage of development and is very short, the authors did not determine the internal consistency of this version of the scale in this investigation. However, to gain some sense of the predictive validity of this instrument, all statistical analyses involving scores from the AAR scale were replicated for the KAC scale.

Interviews. The final phase of the study consisted of follow-up interviews of four teachers. The basic intent of this phase of the research was to gain a better understanding of teachers' views of knowledge acquisition and potential relations between those views and their use or lack of use of computer-based instruction. Each interview began with the following hypothetical question:

> Which of the following two types of software programs that focus on geometry would you prefer to use in your class?
> *Program I*—has no stated objectives and allows students to probe and search, navigate freely, and draw their own conclusions and relationships; or
> *Program II*—has clearly stated objectives that routes the learners through prescribed instruction and practice?"

The researcher then asked each teacher to describe his or her rationale for selecting either Program I or Program II. Using semistructured interview procedures (Fetterman, 1989), the researcher formulated and asked probing questions throughout the interview in an attempt to gain a better understanding of each teacher's: (a) rationale for selecting the objectivist- or constructivist-oriented software program, (b) views of knowledge acquisition, and/or (c) relations between those views and their use of (or failure to use) computer-based instruction. The researcher also attempted to determine the origins of apparent inconsistencies between the computer software programs that two of the teachers selected and their views of knowledge acquisition as assessed by the AAR scale. The descriptors "objectivist" and "constructivist" were not used at any point during the interviews.

Procedures. All members of the experienced teacher and preservice teacher candidate samples completed a questionnaire survey that included: (a) the AAR and KAC scales, (b) items related to demographic characteristics, and (c) questions regarding the respondent's use of computers in instruction. Overall scores on the AAR and KAC scales served as the quantitative measures of each participant's views of knowledge acquisition along the objectivist to constructivist continuum. High scores indicated an objectivist view, low scores a constructivist perspective.

The demographic data provided by the survey included age, gender, teaching level, and number of years of teaching experience. Statistical analyses were conducted to determine which of these demographic characteristics, if any, were meaningfully associated with teachers' conceptions of knowledge acquisition. Teachers who reported that they offered at least some computer-based instruction were then asked to describe how much time they spent each week on computer-based instructional activities and how they used computers in their classrooms (e.g., as supplements to lectures; games). Teachers who said they did not use computers for instructional purposes were asked to describe their reasons for not doing so.

Two of the four teachers who were interviewed were selected on the basis of their very high scores on the *Attitudes About Reality* (AAR) scale (objectivist perspective); the other two were chosen because they had very low scores on this scale (constructivist perspective). *Knowledge Acquisition in the Classroom* (KAC) scores were not considered when making these selections. Teachers at the extreme ends of the AAR scale were selected in order to maximize the likelihood that the interviewees would hold views that were clearly objectivist or clearly constructivist in perspective. Of the two teachers selected to represent each extreme, one was a computer user and one was not. Each interview lasted about 30 minutes.

Results

(1) *Do views of knowledge acquisition vary as a function of level of teaching experience?*

The results of Analysis of Variance (ANOVA) tests of differences in mean AAR and KAC scores for experienced teachers and inexperienced teacher candidates are shown in part (a) of Table 2. As these results indicate, experienced teachers' conceptions as measured by the AAR scale were more objectivist in perspective than the corresponding views of preservice teacher candidates [Means = 96.2 and 92.6 respectively; F-ratio (1, 66 d.f.) = 4.69, $p = .04$]. In contrast, the difference in mean scores for these two groups on the KAC scale was relatively small (M =14.8 for teachers and 14.2 for teacher candidates) and was not statistically significant [F-ratio (1, 66 d.f.) = 1.07, $p = .31$].

However, as is shown in part (d) of Table 2, a strong correlation was found between teachers' scores on the three-item KAC scale and the number of years they had taught ($r = 0.61$; $p < .001$). The greater the number of years of teaching experience, the more objectivist teachers' views were likely to be. In contrast, the corresponding correlation coefficient for the AAR scale was only 0.15 and was not significantly different from zero (alpha = .05).

A closer analysis of the data derived from the KAC scale suggests that the observed relationship between views of teaching as measured by this scale and years of teaching experience was derived in large part from teachers' responses

Table 2. *Contrasts in Views of Knowledge Acquisition Among: (a) Experienced Teachers and Teacher Candidates, and (b) Members of Selected Demographic Subsamples.*

Summaries of one-way ANOVA tests

	AAR Survey				KAC Survey			
	Mean	(s.d.)	F-ratio	(p)	Mean	(s.d.)	F-ratio	(p)
(a) *Experienced Teachers and Inexperienced Teacher Candidates*								
Teachers (n = 36)	96.2	(17.7)			14.8	(2.9)		
Teacher Candidates (n = 31)	92.6	(12.5)	4.69	(.04)	14.2	(2.7)	1.07	(.31)
(b) *Gender*								
Males (n = 13)	96.7	(15.6)			14.5	(2.7)		
Females (n = 23)	95.9	(15.5)	0.10	(.75)	15.0	(2.8)	0.92	(.34)
(c) *Teaching Level*								
Elementary (n = 5)	93.0	(15.7)			15.0	(2.6)		
Junior High (n = 13)	93.4	(15.2)			15.0	(2.7)		
Senior High (n = 12)	96.9	(13.8)			14.9	(2.8)		
Adult Ed. Tchrs. (n = 6)	101.1	(18.3)	0.30	(.83)	14.4	(2.9)	0.06	(.98)

Pearson product-moment correlation coefficients

	AAR Scores		KAC Scores	
	r	(p)	r	(p)
(d) *Years of Teaching Experience (n = 36)*	0.15	0.40	0.51	(<.001)

to one of the three items in the scale; namely, "students are uniquely qualified to manage their own instruction." The eleven teachers who had eight or more years of teaching experience were more likely to strongly disagree with this statement than their counterparts (n = 25) who had less experience as teachers (means = 6.1 and 4.5 for these two subsets of teachers).

(2) *Do views of knowledge acquisition vary as a function of other demographic variables?*

One way Analysis of Variance (ANOVA) tests were also conducted to determine if statistically significant associations existed between teachers' scores on either the AAR or the KAC scale and two demographic variables—gender (male or female) or levels of teaching (elementary, junior high school, etc.). The results of these tests are summarized in parts (b) and (c) of Table 2. As these results indicate, no significant relationships (differences in means) were found between views of knowledge acquisition (as measured by either scale) and either of these demographic variables.

A different statistical procedure was used to examine relations between scores on the two views of knowledge acquisition scales and the other demographic variable that was considered in these analyses—years of teaching experience. Because years of experience is an interval, rather than a nominal measure, Pearson product-moment correlation coefficients were computed for each scale. The results of these computations are presented in part (d) of Table 2. As these results indicate, the correlation between scores on the KAC scale and years of teaching experience was statistically significant (p < .001). But, the correlation between scores on the AAR Scale and years of teaching experience was not (alpha = .05).

Relations between demographic variables and teachers' use of computers in instruction were also considered in this set of exploratory analyses. This phase of the analysis began with a consideration of teachers' estimates of the amount of time they provided computer-based instruction each week. Only 13 of the 36 individuals in the experienced teacher sample reported that they used computers for instructional purposes and only three said they used them for more than one hour per week. Teachers were therefore assigned to one of two groups in these and all subsequent analyses of computer use—those who did and those who did not use computers in instruction. Despite limitations in the proportion of teachers who used computers, the percentage of males who said they provided computer-based instruction (9 of 13 or 69.2%) was significantly higher than the corresponding statistic for females (4 of 23 or 17.4%) [Chi-square = 8.27, p < .01]. However, no significant relationships of this type were found for either levels of teaching or years of teaching experience.

(3) *Is there a relationship between teachers' views of knowledge acquisition and the likelihood they will use computers in their delivery of instruction?*

As the first step in analyzing relations between teachers' conceptions of knowledge acquisition and their use of computers in instruction, each of the 36 teachers in the sample was assigned to one of three groups—objectivist, eclectic, or constructivist—based on their scores on the two survey instruments. Those who scored in the upper quartile on a given scale (n = 9) were assigned to the objectivist group. Individuals who scored in the lowest quartile (n = 9) were assigned to the constructivist group, and those who scored in the midrange (n = 18) were classified as eclectic. Mean scores for the objectivist, eclectic and constructivist groups were 119.0, 95.8, and 74.2 respectively for the AAR survey and 18.0, 14.2, and 11.1 for the KAC scale.

Chi-square tests were then conducted to determine if the proportions of teachers who reported that they used computers in instruction varied across the three groups. The results of these tests are presented in part (a) of Table 3. As these data

Table 3. *Relations Between Teachers' Views of Knowledge Acquisition and Computer Use.*

	AAR Scores			KAC Scores		
	Construc-tivist (n = 9)	Eclectic (n = 18)	Objec-tivist (n = 9)	Construc-tivist (n = 9)	Eclectic (n = 18)	Objec-tivist (n = 9)
(a) *Uses Computer?*						
Yes (n = 13)	2	8	3	5	5	3
No (n = 23)	7	10	6	4	13	6
	• Chi-square = 1.50; p = .30			• Chi-square = 2.25; p = .15		
(b) *How Computers Were Used:*						
Lecture Supplement	2	4	3	4	4	1
Tutorials	0	3	1	1	2	1
Games	1	1	0	1	0	1
Open-ended/ Explore	1	2	0	2	1	0

Note. Some teachers cited more than one way they used computers in instruction.

indicate, there were no clear relationships between teachers' views of knowledge acquisition as measured by either the AAR or the KAC scale and the likelihood they would use computers in instruction.

When the 23 teachers who said they did not use computers for instructional purposes were asked to indicate why they did not provide this form of instruction, most (n = 18 or 78%) cited lack of access to a computer. The only other reasons that were cited by more than one teacher were: (a) lack of support from their administrator/district (n = 7 teachers), and (b) lack of appropriate software (n = 5 teachers). Those teachers who did use computers in their classrooms were asked to describe how they used computers in instruction. Data presented in part (b) of Table 3 describe the responses of the 13 computer-users to this question. As these data indicate, this subset of teachers was most likely to use computers as a supplement to the content presented in lectures. These results also suggest that there were no clear relations between teachers' conceptions of knowledge acquisition as measured by either the AAR or KAC scales and the ways they used computers in instruction.

(4) *Is there a relationship between teachers' views of knowledge acquisition and the types of software programs they are likely to use?*

As described earlier, interviews of each of the four teachers began with a hypothetical question that asked them to identify which of two software programs they would prefer to use if they were asked to teach geometry. The description of one of these programs reflected an objectivist perspective; the other depicted a constructivist orientation. The four teachers were then asked to describe the rationale for their choice of programs. During this semistructured portion of the interview, the interviewer also asked probing questions that were intended to provide a better understanding of the respondent's views of knowledge acquisition and/or relations between those views and his or her use of computers in instruction (or lack thereof). The results are briefly summarized below. Pseudonyms are used throughout this section of the report.

Jane: Computer user; three years of experience teaching economics in junior high school; AAR scale score = 131 (objectivist end of the continuum).

In response to the opening question cited above, Jane indicated that she saw merit in both programs, but that all else being equal, Program II (objectivist-oriented) seemed most useful. She believed in the "basics first" approach. Once students learned what they "needed to know," they would be able to direct and manage their own explorations. She also stated that some parents and colleagues are already critical that children aren't learning the most basic skills in school and would not be likely to support open-ended instruction. Jane used the computer to supplement material learned in lecture. Her primary use of computers was to teach word processing and business spreadsheet applications to her students.

John: Computer user; two years of experience teaching bilingual mathematics in high school; AAR scale score = 69 (constructivist end of the continuum).

John responded to the first question by stating that he would prefer to use Program I (constructivist-oriented) because it mirrors more closely the ill-defined nature of problem solving in real life. However, he added that he often felt like school administrators were "looking over his shoulder" and thus he might be pressured into choosing a program like Program II. John explained that the reality of curriculum and/or time constraints cause teachers to try to cover all the material in the syllabus, often at the expense of the quality of instruction. In his opinion, allowing students to explore and make their own mistakes fosters a deeper level of understanding than occurs when students are forced to follow a prescribed path.

Sally: Does not use the computer; three years experience as a language teacher

at the college level; AAR scale score = 125 (objectivist end).

Sally preferred Program I (constructivist-oriented) because it might encourage a more creative learning environment. However, she also reported that she typically tests students orally on certain clearly defined objectives (e.g., use the past tense of the Spanish equivalent of the verb "to go" in a sentence) and doesn't really care *how* students learn the necessary skills. Sally noted that computers are not used at all in her academic department and thus she has never considered using them.

Mary: Does not use the computer; eight years of teaching experience as a high school math teacher; AAR scale score = 78 (constructivist end).

Mary felt that program II (objectivist-oriented) would be more useful than Program I. She too said she believed in a "basics first" approach and viewed Program I as an enhancement activity. "A teacher needs to *close* a lesson in order to promote student retention," she stated. Mary also argued that using open-ended programs without teaching basics first would cause many students, particularly slower learners, to become frustrated and lose interest.

These perspectives seemed to contradict her descriptions of her earlier participation in an experimental open program in her school. Mary felt that the learning outcomes of that program in which students were able to explore content areas at their own pace were superior to those of her current conventional program. She therefore preferred the earlier program and said she was still willing to sacrifice quantity for quality. She added, however, that even though the students who participated in the experimental program learned a semester's content extremely well, it took them a full year to do so and argued that it is both impractical and unrealistic to expect widespread adoption of such programs given the present curriculum constraints placed on schools. Mary also voiced concerns about large class sizes and the prohibitive amount of time teachers would have to spend to successfully implement unstructured learning environments. Mary cited lack of access (one computer in the entire school outside of the "labs") and lack of administrative support (no inservice training provided) as the primary reasons she did not use the computer for instructional purposes.

Discussion

That teachers' views of knowledge acquisition are likely to reflect more of an objectivist than a constructivist perspective has obvious implications for developers as well as adopters of instructional programs. If teachers prefer one instructional paradigm over another, then their reasons for that preference need to be identified and addressed in the design of computer software. If teachers' views of knowledge acquisition are grounded to a greater extent in an objectivist than in a constructivist perspective, as the results of this study seem to suggest, then committing resources to develop constructivist-based software applications may prove fruitless. However, given the limitations of this study, more research on teacher conceptions is needed to examine the breadth of the market for both constructivist-oriented and objectivist-oriented software programs.

The apparent association between number of years in teaching and views of knowledge acquisition within the classroom context is a potentially important finding that also warrants additional investigation. The results of this study suggest that the greater the number of years of teaching, the greater the likelihood a teacher will have an objectivist view of knowledge acquisition. In particular, experienced teachers are more likely than their less experienced colleagues to believe that students are not qualified to manage their own instruction.

The results of the follow-up interviews suggest that the realities of classroom management and/or pressures from administration and other external sources may sometimes create a classroom environment that favors objectivist-based software programs. When given the choice, interviewees Jane and John, both computer-users, said they preferred the software program that was consistent with their personal views of knowledge acquisition as reflected in their AAR scores. Jane said she would use the structured program which was constent with her objectivist AAR score. However, even though John said he favored the "open-ended" program that was consistent with his constructivist perspective, he conceded that he would probably be pressured by his syllabus-conscious principal to adopt the other, more structured program.

Mary, who also scored at the constructivist end of the AAR scale, felt that the ideal learning environment was an open program in which material could be covered more deeply at the expense of breadth of content coverage as promoted by curriculum requirements. But this personal perspective was apparently tempered by the realities of classroom management, since she said she would prefer the objectivist-based software program over the constructivist-based software. In a similar vein, Sally's stated preference for the open-ended program belied her high (objectivist) AAR scores and her use of objective-based assessment instruments. She apparently believed that her college-age students could effectively manage an open-ended program.

Mary and John, who both scored at the constructivist end of the AAR scale, appeared to be pressured into objectivist-oriented instructional activities by several sources of external influence. The reality of managing classroom activities and student behaviors; student, parental, and administrative expectations; and curriculum constraints were cited as obstacles to their free adoption of student-centered, constructivist-oriented learning environments. Pressure from these sources may, therefore, shape these teachers' preference for computer-based instructional materials in ways that mask or override their personal views of knowledge acquisition.

Although no clear relations were found in this study between teachers' views of knowledge acquisition and their use of computers for instructional purposes, there is an obvious need for additional research in this area. A larger sample size and the development and

use of an instrument that centers more directly on classroom applications would provide a more powerful test of these relations and would increase the generalizability of findings beyond the limits of this study. Further research conducted in a school context in which the proportion of teachers who use computers in instruction is higher than it was in this investigation may also provide a more convincing test of these relations.

More research is also needed to more fully explore how teachers view student knowledge acquisition. The implications for instructional design and curriculum reform are obvious. The teacher has long been the "gatekeeper to the classroom," yet surprisingly little is known about teachers' views of knowledge and its acquisition. It is time to examine teachers' and the rest of society's conceptions of how knowledge is acquired as a stepping stone toward meaningful curriculum reform. □

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Educational Technology Research Section

The Research Section of *Educational Technology* publishes original studies of technology (broadly conceived) in diverse educational settings. Therefore, the Editor seeks manuscripts from a variety of academic disciplines and substantive fields. Articles are especially encouraged that address the contexts in which educational technology supports learning, and in so doing, employ alternative inquiry approaches (including interpretive, critical, semiotic, narrative, etc.).

Technical quality and the significance of the topic under investigation are primary criteria in article selection. Specifically, studies should have theoretical value and currency, as well as practical value and usability. For studies that are experimental or quasi-experimental in nature, hypotheses should be offered that are supported with reference to relevant literature; methodology should fit the problem and control for likely confounding variables; measures should be adequately operationalized, and practical significance should be addressed for any statistically significant findings.

For studies representing alternate inquiry approaches, relevant literature should be cited that supports the conceptualization of the problem and selection of the research approach; methodology should fit the problem and cohere with background assumptions; data synthesis and analysis should make explicit the interpretive and reasoning processes of the researcher, and sufficient triangulation should occur to lend credibility to the findings.