Research in Rural Education, Volume 2, Number 4, Spring 1985

Computer Attitudes and Knowledge in Rural Settings[1]

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Students' and teachers' attitudes and knowledge about computers are important to the successful implementation of computers into educational programs. This study of 198 students and 43 educators examines computer attitudes and knowledge in rural settings. Rural educators and students were found to have positive attitudes toward computers. Educators demonstrated significantly higher knowledge levels than students. However, over half of the students indicated having a computer at home as compared to only about one-third of the educators.

Few educators today are debating whether or not computers should be introduced into the classroom. The discussion now is when they should be introduced and how they should be used.

Reports are commonplace about how students have responded enthusiastically to the introduction of computers into the classroom [2; 3; 9]. Nonetheless, Lawton and Gershner [5] reported finding few empirical studies on students' attitudes toward computers. And, computer anxiety, or computerphobia, among some students has been documented in the literature [4].

Some research has been done that indicates educators are generally optimistic about computers in education [1; 6]. Computer knowledge among educators has been increasing but there has been no corresponding increase in computer attitudes [8]. Educators seem to be positive about computers as long as the function of computers is removed from their classroom [7].

In general, both students and educators have reported positive attitudes toward computers. For teachers, these attitudes seem to be less favorable when faced with computers in their own classrooms. While the knowledge level of teachers about computers has been increasing, there is little information on what this means or how it compares to the knowledge level of students. Most of the research to date has been done in larger metropolitan school districts. Little has been done in rural settings.

PURPOSE

The purpose of this study was to determine computer attitudes, computer knowledge and computer access for students and educators in rural settings.

METHODOLOGY

The procedure used was to administer the Computer Survey to students in grades 9–12 and educators employed in grades K–12 from randomly selected rural school districts in Missouri and Southern Illinois. Data collection occurred during the late Spring, 1984.

Computer Survey

The survey used in this study was developed by the authors. It was pilot tested in undergraduate and graduate education classes. The final form of the survey consisted of the following four parts.

1. Attitudes About Computers	18 items
2. Computer Knowledge	15 items
3. Demographics	4 items
4. Specific question for students and educators	

Sample

The sample consisted of 198 students and 43 educators from 10 rural school districts in Missouri and Southern Illinois. The sample breakdowns were:

A. Students

9th grade	36
10th grade	20
11th grade	63
12th grade	73
Missing	6

B. Educators

Teachers	35
Administrators	8

Administration

The surveys were administered at the school sites by school personnel. Students were administered the survey within classrooms by teachers selected by school administrators. All types of classes were utilized. The teachers were asked to complete the surveys on their own time and return for forwarding to the researchers. Responses to the survey were coded on NCS general purpose answer sheets for computer processing.

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[1]Paper presented at the annual conference of the American Educational Research Association, SIG/Rural Education, Chicago, IL, March 3, 1985, 10:35–12:05.

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Analyses

The primary mode of analysis was descriptive. Bivariate analyses were used to test a few specific research questions, such as whether or not there was a significant difference between the knowledge levels of students and teachers.

RESULTS

Attitudes

Few differences were found between educators and students. Therefore, the pooled results are presented. Analyses of the 18 items are presented in Table 1. In general, the respondents view computers in society and education positively. For some areas there is an obvious lack of consensus as to the influence of computers.

Of note, both the students and teachers felt that computers were going to have an impact on instruction. This was true in general (80% agreement) and for both learning of higher-order skills (76% agreement) and drill and practice (70% agreement). Few respondents (20%) indicated that they believed that computers would displace teachers and even fewer (11%) felt that computers can teach better than teachers. Interestingly, though, less than one-fourth of the respondents thought that the computer would have greater impact on education than other technological advances such as educational television.

Most of the respondents (71%) viewed the computer as a tool just like a hammer or lathe. Most (71%) felt that it can be understood by the typical person. They indicated that the computer will create jobs needing specialized training (87% agreement); but few (33%) felt that it will replace low-skill jobs. Interestingly, few respondents suggested that the computer will dehumanize society (20% agreement) or that it will improve health care (38%). Yet, three-fourths of the students and

TABLE 1

Responses to Attitudes Items for the Computer Survey

ATTITUDE QUESTIONS	N	PERCENT				
		AGREE		NEITHER	DISAGREE	
		(1)	(2)	(3)	(4)	(5)
Cannot escape influence of computers	224	36.16	38.84	15.18	8.04	1.79
Suited for repititive, monotonous tasks	224	14.28	30.36	27.68	20.98	6.70
Computers make mistakes at least 10% of the time	222	3.15	7.66	31.98	27.48	29.73
Computers will replace low-skill jobs	223	7.18	26.01	35.43	22.42	8.97
Computers are beyond understanding of typical person	224	4.02	10.71	13.84	39.73	31.70
Polls influence outcomes of elections	224	5.80	32.14	34.38	14.73	12.95
Computer is a tool just like hammer or lathe	224	20.98	50.00	12.50	9.82	6.70
Computers will create jobs needing specialized training	223	27.35	59.64	8.07	2.24	2.69
Computers will improve health care	225	13.78	24.44	38.67	12.00	11.11
Computers will dehumanize society	226	5.31	15.04	35.84	25.22	18.58
Computers will improve education	226	36.78	43.36	13.27	3.54	3.10
Computers will improve learning of higher-order skills	226	20.80	54.87	19.03	2.21	3.10
Computers will improve drill and practice	225	24.00	45.78	24.00	4.00	2.22
Computers will dehumanize teaching	226	6.20	13.72	39.38	26.11	14.60
Computers will displace teachers	225	5.78	8.89	28.00	32.00	25.33
Computers can teach better than teachers	226	5.31	6.20	30.09	28.32	30.31
Computers will have the same impact as instructional T.V.	225	8.44	39.56	26.67	18.22	7.11
I will be willing to copy copyrighted software	225	7.56	23.11	44.00	15.11	10.22

TABLE 2

Factorial Analysis of Achievement Results

Comparison	Classification	N	Mean	F
Group	Students	190	5.28	5.34*
	Educators	41	6.85	
Sex	Females	128	4.80	5.02*
	Males	103	6.51	
Interaction	Students			
	Females	104	4.54	
	Males	86	6.18	
	Educators			
	Females	24	5.90	
	Males	17	8.20	

* $p<.01$

teachers indicated that people will not be able to escape the influence of computers on their lives.

Students and teachers did differ on their willingness to copy software. One-third of the students said that they would copy copyrighted software; two-fifths of the teachers said that they would do it. About one-fourth of each group said that they would not copy the software. Significant percentages of each group indicated that they did not know whether or not they would copy it. The majority of both groups said that either they did not know or would be willing to copy software even though it is illegal. No relation was found between whether or not the respondent had a home computer and willingness to copy software (30% responded "yes" and 25% responded "no").

Knowledge

The knowledge test consisted of 15 items designed to assess computer knowledge at three levels. The first five items reflected basic awareness information, the second level required an "advanced" awareness, and the third level reflected programming capability with some computer operational theory. The instrument was pilot tested using undergraduate university students not majoring in computer science. Only two items had difficulty levels that suggested misplacement, one each at the first two levels. These items were revised for the final form. Other revisions involving minor rewording and modifications of item alternatives were made based on response discrimination and difficulty levels. The alpha coefficient for the test was 0.87.

The educators demonstrated higher knowledge levels than did the students. Over half of the educators scored at the "advanced" awareness level (scores 6–10) compared to only about two-fifths of the students. Few respondents scored at the third level.

A two by two factorial comparison was run to determine the significance of differences among the mean knowledge levels. The two factors were group and sex. Both group and sex effects were significant (see Table 2). There was no interaction. The educators demonstrated greater computer knowledge than did the students; the males demonstrated greater knowledge than the females. Of particular interest here, though, is that without interaction effects, these data indicate that the male students were more computer literate than the female educators. The order of knowledge was male educators (8.20), male students (6.18), female educators (5.90), and lastly female students (4.54). These differences among means suggest potential problems when a large grouping of students knows more about computers than do the female educators. In addition it signals a potentially serious sex equity problem concerning computers in rural schools.

Other Analyses

Contained in the survey were several specific questions designed to determine computer access, computer use and expected purchases. Responses to these questions are summarized in the following paragraphs.

Computer Access. The students were asked whether or not they had home or school access to computers. All the students had some school access to computers and 38.05% had home access. Apple computers were the most frequently available computer at school and Atari was the most frequently available at home (see Table 3). Radio Shack computers were the second most frequent both at school and home, followed by Commodore and then IBM. Teachers were asked whether or not they had computers in the classroom. The majority of teachers (76%) indicated that they had one computer in their classrooms. Most of these (46% of the total) had an Apple. Only 12 percent of the teachers indicated that they had more than one computer in their classrooms. Of these, two-thirds indicated having 6 to 10 computers and the other one-third said that they had over 10 computers. In all these cases, the computers were Apples.

Use of Computers. The teachers were asked how they

TABLE 3

Percent of Students Having Computer Access

	Type of Computer					
Use At:	APPLE	COMMODORE	IBM	RADIO SHACK	ATARI	OTHER
Home	7.08	6.20	3.54	7.08	18.58	11.50
School	70.65	22.39	19.90	31.34	–	31.34

used computers in the classroom. The primary use was for drill and practice (62%), followed by simulation activities (50%), programming (21%) and then inquiry (17%). Half of the administrators stated that they used a microcomputer in the office. In no school was a computer available to teachers in the staff lounge.

Computer Affects. Both teachers and administrators were asked to rate how computers have affected teaching. The majority of teachers (77%) indicated that computers have been an improvement (68% said some improvement and 9% said major improvement). Only 60 percent of the administrators felt that computers have been an instructional improvement (40% some improvement and 20% major improvement). Twenty percent of the administrators indicated that there had been major problems with introducing computers into the classroom. Only 9 percent of the teachers expressed these problems. The vast majority of administrators (80%) felt that microcomputers had provided some improvement in administration. None felt that there had been major improvement and 20 percent indicated some problems.

SUMMARY

This study was survey research of 198 students and 43 educators in rural districts to determine their attitudes and knowledge about computers, computer access and computer utilization. Both groups demonstrated positive attitudes toward computers in society in general and in education specifically. Both teachers and students indicated willingness to copy copyrighted software.

Teachers demonstrated greater knowledge of computers than did students and males demonstrated greater knowledge than did females. Of particular concern, the male students obtained higher achievement scores than did the female teachers. This signals concern for both the teaching-learning process and sex equity in computer knowledge within rural schools. All groups were at the basic awareness level or higher in computer knowledge.

Most classrooms had available to them one computer, usually an Apple. Other computers sometimes found in the classrooms were Radio Shack and Commodore. All students had access to computers at school and slightly over one-third had access at home. The most common home computer was Atari. Typically, administrators and teachers saw computers as having positive affects on instruction. The most common use was in drill and practice activities.

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