Who's Using What and How Often: An Assessment of the Use of Instructional Technology in the Classroom

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ABSTRACT. Instructional technology is perceived as a vehicle for curriculum enhancement across grade levels and academic subjects. With this in mind, it is important to determine whether or not today's teachers are effectively integrating the available technologies into the classroom. The purpose of this study was to assess current use of instructional technology in the elementary, middle and junior high public schools in an east central Florida school district. This assessment examined types of instructional technology being used in the classroom and frequency of use. Results indicate that the majority of surveyed teachers (59%) use some form of technology with their students at least once a week. In addition, variables that distinguish teachers who use technology from those not using instructional technology were identified and analyzed with the use of multiple regression.

An examination of the literature indicates that certain patterns may be discerned regarding the value of instructional technology in the classroom. Numerous studies indicate that instructional technology has the potential for enhancing student learning (Hadley & Sheingold, 1992; McDaniel, McInerney & Armstrong, 1993; Hannafin & Savenye, 1993). Hadley and Sheingold (1993) conducted a nationwide survey of 608 teachers from 576 different schools to demonstrate the potential effectiveness of technology in the hands of "experts." The sample for this study was selected on the basis of their extensive involvement and accomplishments in integrating technology into their teaching. Hadley and Sheingold (1993) found that many of these teachers believe their teaching has been transformed by incorporating technology into the classroom.

A majority of the surveyed teachers stated that they teach differently and more effectively now, than in the past. These perceived changes were threefold. First, these teachers said they expect more from their students and are able to present more complex material. "Concepts are being learned that I would never have considered [teaching] 20 years ago" (Hadley & Sheingold, 1993, p. 276).

A second perceived change involves individualization of learning. These surveyed teachers believe technology has enabled them to meet the needs of individual students more effectively. "...I let the students set their own individual pace, and take responsibility for their own learning." (Hadley & Sheingold, 1993, p. 276)

The third change is a shift from the traditional teacher centered classroom to a student centered classroom. Many of these teachers say they are taking on the role of a coach or facilitator as opposed to an "information dispenser" or lecturer. Their students are involved in more active learning and more independent, self motivated learning. These findings suggest that teachers who have incorporated technology into their classrooms have altered their teaching and enhanced their students' learning.

Current Technology Use in the Classroom

Numerous surveys have been conducted to assess the current use of instructional technology in the classroom. From the results of a national survey, Becker (1991) found that only a small proportion of instructional activities actually incorporate technology. "... computers in most subject-matter classes serve primarily as enrichment or for occasional individual remediation rather than as a major way that students learn to think and accomplish learning and understanding in that subject" (Becker, 1990, p. 5). Hadley and Sheingold (1993) stated that, "technologies are peripheral to learning and teaching for most teachers and students. They generally provide either an add-on activity or simply technological versions of the workbook..." (p.265).

Bosch (1993) observed 90 middle school classrooms and conducted personal interviews with 30 teachers and 30 students over three semesters. Bosch indicates that her findings suggest a computer "crisis" in middle-level classrooms. Sixty percent of the observed classrooms did not have a computer. In the classrooms equipped with a computer, it was not being used. During her observations, Bosch did not document any computer use by students or teachers.

Furst-Bowe (1992) surveyed 22 technology education graduates after their first year of teaching to assess their use of instructional technology. She found that more than 75 percent of the respondents stated that they had never used CD-ROM or laser videodiscs in the classroom. Although this was a very small sample, similar findings were reported by Descy (1992) who surveyed 35 elementary education graduates after their first year of teaching. One hundred percent (100%) of these respondents had never used a laser videodisc during their first year of teaching and 94 percent never used CD-ROM. "The results of the study do support earlier research that found little overall use of instructional media in the elementary classroom" (Descy 1992, p. 19).

These studies have indicated a limited integration of technology into the curriculum nationwide. Computers and other computer-based technologies are not being effectively incorporated into schools and are not part of the core learning.

Barriers to the Use of Instructional Technology

Factors have emerged that provide insight into common barriers to the effective integration of instructional technology into the classroom. After surveying 352 teachers to assess their use of computers in the classroom, Zammit (1992) found that a major obstacle to successful technology

integration was the lack of teacher confidence and skill when using technology. Both Becker (1991) and Zammit (1992) reported that teachers perceive the largest impediment to skilled computer use is that they lack the time to learn how to efficiently use the technology.

In addition, Zammit (1992) and Jones (1991) found that many schools had provided substantial funds to invest in hardware but fewer funds were provided for the professional development of teachers. Zammit (1992) reported that it has been easier for many school districts to approve expenditures to purchase equipment than to pay for time to enable teachers to develop their knowledge and expertise. According to Zammit (1992), this situation continues despite the fact that acquisition of the best equipment is not a guarantee that this equipment will be used effectively.

There is also evidence that new teachers are not obtaining the preservice training necessary to competently use the current technology in the classroom. As reported by Scrogan (1989), the majority of teachers today have little or no training in the use of technology. Eighty-seven percent of the respondents in the Hadley and Sheingold (1993) survey indicated that their knowledge of technology was to some extent self-taught. Handler (1993) conducted a survey of 133 recent education graduates to assess their perceptions of their preparedness to use computers for instruction in the classroom. Approximately 81 percent of the respondents indicated feeling unprepared by their preservice program to use computers for instruction. Her findings indicate that teacher computer literacy is not yet a significant concern for most teacher education programs. "Despite the growing need for technology training, there is little evidence that typical preservice education programs are permeated with opportunities to work with technology" (Handler, 1993, p. 147). Winnans and Brown (1992) reported similar findings. A majority of the elementary school teachers they surveyed reported taking three credits or less in the use of instructional technology during their preservice training.

The benefits of instructional technology use in the classroom cannot be realized if available technologies are not being used and this problem needs to be addressed and rectified. Although there is not one general solution to the successful integration of instructional technology, factors that differentiate technology users from non-users need to be identified.

The Florida legislature has established a state policy regarding the use of technology in education. The current policy is to: " ... use computers and related technology to make instruction and learning more effective and efficient..." (Brittain, 1988, p. 31). This study was designed to address whether this policy is being implemented. The primary focus of the study was to ascertain whether the available technologies in Brevard County, Florida were being used and identify key variables that differentiate technology users from non-users.

For the purpose of this study, instructional technology was defined as computer-based technology including computer hardware, software, CD-ROM, and laser videodisc. It also included laser videodisc controlled through the use of a bar code reader or remote control. These forms of

instructional technology provide teachers and students with vast quantities of information in an easily accessible, non-sequential format. They can be used as a teaching tool to help demonstrate or explain new concepts. Students can also explore instructional programs independently or in small groups.

Technology user was defined as a teacher who uses some form of the above-mentioned instructional technology with his or her students at least once per week. Technology non-user was defined as a teacher who never or infrequently (less than once per week) uses some form of instructional technology with his or her students.

Classroom use of instructional technology was defined as technology that is employed in the classroom or computer laboratory for the purpose of student instruction. This does not include the use of technology employed by teachers for non-instructional tasks such as record-keeping.

Method

Subjects

The target population for this study was comprised of the elementary, middle and junior high public school teachers in Brevard County, Florida. The Brevard County school district is the 56th largest among the public school systems in the United States, and is the ninth largest in the state of Florida. There are currently 3,976 teachers employed by the county and the present student enrollment is approximately 61,000 students (School Board of Brevard County, 1994). The 1993-94 district budget for Brevard County was approximately $446 million (School Board of Brevard County, 1994). For the school year 1992-93 teacher's salaries averaged $28, 950 at the elementary level and $29,084 at the middle/junior high school level. Expenditures per student at the elementary and middle/junior high level were $3,170 and $3,366 respectively (Florida School Report, 1993).

The sample selection for this study was a two-stage random process. This procedure combines cluster random sampling with individual random sampling. There are sixty elementary, middle and junior high public schools in Brevard County and a random numbers table was used to select ten of these schools. The accessible population for this study consisted of 200 teachers who were selected to complete a questionnaire. The sample for this study consisted of 110 teachers who completed and returned the questionnaire.

Subject characteristics are a potential threat to the internal validity of this study. Teachers selected to complete the questionnaire may differ from the target population and each other in unintended ways related to the variables being studied. The two-stage random selection of subjects was employed to help minimize this threat. To establish representativeness of the sample, demographic information about teachers currently employed by the county was obtained from the Brevard County school board. The sample for this study does not appear to be skewed demographically with regard to teacher age and experience. The mean age of the teachers in Brevard County is 42, and the mean number of years of teaching experience is 13 (personal communication, School Board of Brevard County, July 1994). The mean age of teachers participating in this study was found to be 41.7 and the mean number of years of experience was 12.1. It should also be noted

that the ten randomly selected schools where the questionnaires were distributed represented all areas of Brevard County (north, central and south).

Although this was not an experimental research study, Cohen's tables were used to approximate a minimum sample size. With alpha set to .05, power of .90 and a medium effect size (.50) the desired sample should be at least 84. A return rate of approximately 42% was needed to obtain this sample size. Of the 200 questionnaires distributed, 110 were completed and returned. This constituted a response rate of 55% which exceeded the desired minimum response rate of 42%. All subjects except three, completed the questionnaire in its entirety. The three teachers not fully completing the questionnaire failed to respond to only one question each.

Instrumentation

The instrument used for this study was a researcher-developed questionnaire which was constructed after reviewing related research and survey instruments. This questionnaire included questions pertaining to the extent of personal training in the use of instructional technology, and categorical response questions on the frequency of instructional technology utilization. It also included questions pertaining to teacher demographic information and questions to assess teachers attitudes toward the integration of instructional technology into the classroom. The questionnaire consisted of 19 questions and was designed to be easy to read and easy to complete, in an attempt to increase the response rate.

The questionnaire was pilot-tested with the cooperation of a group of teachers currently enrolled at a technological university in east central Florida. The reliability of the questionnaire was established using the test-retest method with the above mentioned pilot group. As suggested by Fraenkel and Wallen (1993), a two month period was deemed an appropriate time interval between the two administrations of the questionnaire. All subject responses were found to be identical.

A cover letter accompanied the questionnaire to explain the purpose of this study. The letter also attempted to encourage teachers to respond to all questions as honestly as possible and assured them that their responses would be kept confidential. Directions were included to clearly inform teachers of the response task.

Data Collection

A cover letter and questionnaire were given to twenty randomly selected teachers at each school. Teachers were able to complete the questionnaire in private and at their own pace. They were not subjected to the influence of other teachers or administrators while completing the questionnaire, which hopefully promoted more honest responses. A self addressed envelope was also provided and teachers were instructed to return the questionnaire directly to the researcher to minimize a breach of confidentiality. As suggested by Fowler (1993), individuals such as administrators, who might be able to identify respondents by their profile of answers were not permitted to view the actual questionnaire responses.

The obtained data were organized and analyzed using the software program Microsoft Excel. A breakdown of item response per question, including frequencies and percentages of total respondents was performed. In an attempt to answer questions pertaining to the type of technology used and the frequency of technology use, teacher responses were coded for ease of analysis and interpretation as follows:

0 = Never
1 = Less than once per month
2 = At least once per month
3 = At least once per week
4 = Daily

The responses to four survey questions were used to determine the subgroups of "technology user" and "technology non-user". A teacher responding with a 2 or less to all four questions, was classified as a technology non-user. This term was operationally defined as a teacher who never or infrequently (less than once per week) uses some form of instructional technology with his or her students. A teacher responding with a 3 or higher to any of the four questions was classified as a technology user. This term was defined as a teacher who uses some form of instructional technology with his or her students at least once per week. Of the 110 respondents in the sample, 65 (59%) were found to be technology users and 45 (41%) were found to be technology non users as defined above. In addition, a total technology use score was calculated for each respondent by adding the coded values to questions 3, 4, 5 and 6.

Numerous crossbreak tables were constructed and Chi-square tests for independence were conducted. These tests were performed to determine if a relationship existed between the variable of technology use and the other investigated variables of teacher age, gender, years of teaching experience, amount of training, grade level taught and the availability of technology. The results of these chi-square tests prompted further investigation of the variables: hours of inservice training, availability of a computer in the classroom, and grade level taught and with the use of multiple regression.

Results

The results of this study are presented in two parts. The first part deals with the descriptive statistics associated with the data collected. The second part presents the inferential statistics used to analyze the obtained data.

Descriptive Statistics

This survey study investigated the use of instructional technology including computers, CD-ROM, and laser videodisc and the frequency of instructional technology use. In addition, the study attempted to identify variables that differentiate technology users from non-users. As stated previously, teacher responses to questions pertaining to the frequency of technology use were

converted to numerical values for ease of analysis and interpretation. Computer use in the classroom was found to be the type of instructional technology most frequently used on a daily basis. CD-ROM was found to be the type of instructional technology never used by the largest number of respondents (63 of 110 or 57%). Laser videodisc was found to be the type of technology used least on a daily basis as reported by only 3 of 110 respondents.

The scores for questions 3, 4, 5 and 6 were combined for each respondent to obtain an overall technology use score. The potential scores ranged from 0 (e.g. teacher never uses any form of the surveyed technology) to 16 (teacher uses all types of the surveyed technology on a daily basis). Fifteen of the 110 teachers surveyed obtained a technology use score of 0 indicating they are not currently using any type of the surveyed technologies. The mean overall technology use score was 5.07 and the standard deviation was 3.58.

To further investigate variables that differentiate technology users from non-users, the survey contained questions to assess teacher attitudes towards the benefits of instructional technology and teacher willingness for future technology training. Ninety-seven (88%) of the surveyed teachers reported they believe technology can improve the clarity and enhance the content of instruction. Thirteen of the respondents were not sure or did not believe technology could enhance instruction. Of these 13 teachers, 11 were found to be technology non-users.

Ninety-eight (89%) of the respondents believed that instructional technology could increase the motivation of their students. Twelve respondents were not sure or did not believe technology could increase the motivation of their students. Of these 12 teachers, 11 were found to be technology non-users.

Only 6 of the 110 teachers surveyed stated they would definitely not be interested in future technology training. Three of these teachers indicated they never use instructional technology with their students. Interestingly, all six of these teachers had five or less hours of inservice training in the use of technology. Of those teachers who reported they would or might be interested in future training, 51% stated they would prefer this training to be during regular school hours.

Inferential Statistics

Data were analyzed with the use of inferential statistics in two stages. The first stage included numerous chi-square tests for independence to investigate what factors differentiate technology users from technology non-users. Chi-square is a nonparametric testing technique used to test the independence of two variables. Two variables are considered independent when the frequency distribution for one variable is not related to the categories of the second variable (Gravetter and Wallnau, 1992). Table 1 reports the results of these Chi-square tests.

Table 1

Chi-Square Tests for Independence, Relationship of Technology Use to other Variables

	df	n	χ^2	C
Teacher Age	4	110	3.995	0.19
Years of Teaching Experience	4	110	2.137	0.14
Preservice Credits	3	109	0.440	0.06
Inservice Hours	4	110	10.961*	0.30
Classes on Own Time	1	109	4.896*	0.21
Teacher Gender	1	110	3.721	0.18
Grade Level Taught	3	110	16.576*	0.36
Computer Lab	1	110	0.001	0.00
Computers in Classroom	3	109	15.846*	0.36

* significant at $p < .05$; C = Contingency Coefficient

The relationship of technology use to the variables of computers in the classroom, inservice training, classes on own time, and grade level taught were found to be statistically significant.. A significant χ^2 does not necessarily indicate a cause and effect relationship but only that the investigated relationship between the variables exceeds the relationship normally expected by chance.

Multiple regression was used in the second stage of the analysis to further investigate the relationship of technology use to grade level taught, hours of inservice training and the availability of a computer in the classroom. This decision was based on the significant Chi-square values relating grade level taught, inservice hours and computers in the classroom to use of instructional technology.

Hierarchical multiple regression was employed to conduct an analysis of covariance. ANCOVA is used to describe the relationship between a dependent variable and a nominal independent variable, controlling for the effect of one or more covariates (Kleinbaum & Kupper, 1978). Such control is designed to reduce the error term and increase the precision of the analysis. Data on the dependent variable and each independent variable under consideration were available for all respondents, hence missing data was not a problem.

The calculated technology use scores presented in Table 2 served as the dependent variable. The covariate set A of X1 - inservice hours (linear term) and X2 - availability of a computer in the classroom was entered into the regression model first. Hours of inservice training was reported as a quantitative variable and the availability of a computer in the classroom was dummy coded; 0 = no computer, 1 = one or more computers in the classroom. As Hadley and Sheingold (1993) reported, teacher inservice training and availability of equipment have a substantial impact on technology use.

It was assumed that these variables were reliably measured as they were reported directly by each respondent.

Set B, representing grade level taught, was entered in the second step of the hierarchical analysis. Grade level taught was coded as a categorical variable since many respondents taught more than one grade level. The three grade level groups of K - 2, 3 - 5 and 6 - 9 were effects coded using the variables X3 and X4.

The interaction terms X5, X6, X7, and X8 were the final variables entered into the model. These four variables represented the interaction of sets A and B and were constructed by multiplying X1 and X2 by each of the independent variables in set B. A summary of these three regressions is presented in table 2.

Table 2

Analysis of Technology Use, Inservice Hours, Availability of a Computer and Grade Level Taught

IV Added	df	Cum. R^2	I	F
X1, X2 - Set	2, 107	0.308	0.308	3.9*
X3, X4 - Set B	2, 105	0.397	0.090	7.8*
X5 to X8 - A x B	4, 101	0.402	0.005	0.2

Note. Set A = Covariates; Set B = Grade Level Taught; I = increment in R^2; p < .05.

As indicated in table 2, the increase in R^2 due to the interaction set was .0046 which was not significant [F (4, 101) = .19, p < .05. When the interaction term is found to be non-significant, it is assumed the regression is homogeneous across groups and a valid ANCOVA investigation of R^2 B.A is permitted (Cohen and Cohen, 1983). Thus, the analyses sought to investigate the variance in the technology use scores due to grade level taught after controlling for or partialing the variance due to set A, the covariates.

Set A, the number of inservice hours in the use of instructional technology and the availability of a computer in the classroom accounted for approximately 31% of the Y variance, which was

significant [F (2,107) = 23.86, $p < .05$]. The R^2 including the covariates in set A and grade level taught, set B, without the interaction terms was .3979. The R^2 increase due to grade level taught was .0895. This value is also interpretable as I_B or sR^{2B} which represents the variance uniquely accounted for by grade level taught (Cohen & Cohen, 1983). That is, grade level taught explained approximately 9% more of the variance in the technology use scores beyond that explained by hours of inservice training and availability of a computer in the classroom, a significant increase [F (2, 105) = 7.80, $p < .05$]. Combined, these three variables accounted for almost 40% of the technology score variance.

In addition the value of pR^{2B} was calculated. According to Cohen and Cohen (1983) this is a more suitable measure for the effect size of group membership than I_B, because the denominator for this value incorporates $1 - R^2Y_{.A}$ rather than $1 - R^2Y_{.AB}$. This value was found to be .1294. Thus, grade level taught freed of the covariate differences, accounted for approximately 13% of the adjusted Y variance.

Power for the regression analysis involving technology use, inservice hours, availability of a computer and grade level taught was calculated post hoc as a function of n (n = 110, the number of returned surveys). Power was found to be high at approximately .95.

Limitations

Ecological validity refers to the degree to which the results of a study can be extended to other locations or settings (Fraenkel and Wallen, 1993). Since each state has its own teacher certification requirements and each school district is unique with regard to teacher inservice training, funding and available technologies, study findings may only be generalizable to school districts similar to the Brevard County, Florida school district as described in the sample section of this paper.

Discussion

Technology Resources in Use

This study sought to determine which instructional technology resources were being used by the elementary, middle and junior high teachers in Brevard County, Florida. The types of technology resources being investigated included computers, CD-ROM and laser videodisc. Without regard to frequency of use, it was found that 95 of 110 respondents were using some form of the above-stated technology resources with their students.

Computers were found to be the most prevalently used instructional technology resource. Eighty-nine of 110 respondents reported using computers in their classroom or a computer lab for the purpose of student instruction. Sixty-six respondents reported having one or more computers in their classroom and 83 reported having a computer lab at their school. Although some teachers indicated they share a computer with other classrooms, only 2 of 110 respondents (1.8%) reported not having a computer in their classroom or a computer lab available at their school. This indicates that lack of technology use with regards to computers is not due to the unavailability of equipment. During the 1991-92 school year, there were approximately 4,600 computers available in the Brevard

County schools for student instruction (Parks and Bennett, 1992).

The results of the questionnaire also indicated that 12 of the teachers who reported having one or two computers in their classroom stated they never use computers for student instruction. In addition, 19 of the teachers who reported having a computer lab at their school stated that they never use the lab with their students. These findings are similar to those reported by Bosch (1993) in that the available equipment is not being utilized by all teachers.

Use of both CD-ROM and laser videodisc was found to be less prevalent among the surveyed sample. These findings are similar to those reported by Furst-Bowe (1992) and Descy (1992). Sixty-three respondents stated they never use CD-ROM and 42 reported never using laser videodisc. A laser videodisc player should be currently available at every school in Brevard County. The availability of CD-ROM was not investigated.

Frequency of Technology Use

The frequency with which teachers use technology was also investigated. Teachers were classified as technology users or technology non-users based on their answers to frequency of use questions. It was believed that this method of classification applied more consistent, objective standards for categorizing respondents rather than permitting teachers to classify themselves as either technology users or non-users.

Using the previously defined method, 59% of respondents were classified as technology users and 41% were classified as technology non-users. These results differ from the findings of two similar studies with regard to the percentage of teachers using technology. Winnans and Brown (1992) conducted a survey to assess the use of technology at the elementary school level, and found that only 13 of 70 respondents (19%) stated they used technology in the classroom at least 2 hours per week. Zammit (1992) also conducted a technology use survey, and reported that only 102 of 352 respondents (29%) used technology in the classroom more than once per term.

Variables Differentiating Technology Users and Non-users

The study also investigated variables that differentiate technology users from technology non-users. Inservice hours, classes on own time, grade level taught, and computers in the classroom were found to be significantly related to technology use. In this study, teacher age, teacher gender, years of teaching experience, preservice technology credits, and availability of a computer lab were not found to be significantly related to technology use.

The four variables this study found to be significantly related to technology use have been reported in the findings of previous studies. Jones (1991) and Byers (1992) found a relationship between inservice instruction and technology integration. Teachers receiving "hands on" inservice training were found to be more comfortable using technology in the classroom. In the current study, 76% of teachers receiving 11 or more hours of inservice training were classified as technology users,

while only 48% of the teachers receiving 0 - 10 hours of inservice training were classified as technology users. Although the relationship of preservice credits and technology use was not significant, the lack of teacher preservice training supports the findings of other studies (Scrogan, 1989; Handler, 1993; Winnans & Brown, 1992). Eighty-two percent of respondents in this study reported taking three credits or less in the use of instructional technology during their preservice training.

Taking classes on their own time was a significant factor in the use of technology as reported by Hadley and Sheingold (1993). Seventy-six percent of respondents in the Hadley and Sheingold (1993) survey indicated they had taken courses or workshops on their own time. Seventy-one percent of teachers in this study classified as technology users reported taking classes on their own time. Hadley and Sheingold (1993) also reported that access to technology was a predominant factor contributing to successful technology integration. In this study, 71% of teachers who reported having one or more computers in their classroom were classified as technology users.

Grade level taught was also a significant variable in relation to the use of technology. Fifty-eight of 83 elementary teachers surveyed (70%) were classified as technology users. Only 26% of middle and junior high teachers were classified as such. Similar findings were reported by Becker (1991) although Becker's grade level breakdown consisted of upper-elementary and secondary teachers. He reported that 74% of the elementary teachers surveyed were using computers with their students whereas only approximately 37% of the secondary teachers were doing so.

Summary and Conclusions

This study was conducted to obtain a broad overview of the use of instructional technology in Brevard County. Several positive findings emerged from the survey data. The results indicate that the majority of teachers surveyed (59%) use some form of technology with their students at least once per week. This percentage is higher than figures reported for similar studies. The results of the study also indicate that the majority of the surveyed teachers recognize the benefits of instructional technology. In addition, 95% of surveyed teachers stated they would or might be interested in future inservice training in the use of technology. These findings are in accordance with Scrogan (1989) who reported that most teachers want to learn how to use technology effectively.

The results of the survey also indicate two important findings that need to be addressed. One is the lack of technology use at the middle and junior high school level. Only 7 of 27 surveyed respondents (26%) who teach at the middle or junior school level were classified as technology users. Although the covariates of inservice training hours and availability of a computer in the classroom explained a significant amount of the variance in the technology use scores, there was no significant interaction found between these variables and grade level taught. In other words, teachers across grade levels have on average, the same mean hours of inservice training and a comparable number of computers in the classroom. It was also found that grade level taught significantly contributed to the variance in technology use scores beyond that explained by the covariates. Teachers in grades

6, 7, 8, and 9, use instructional technology significantly less frequently than teachers at the K - 5 levels. This discrepancy needs to be further investigated and rectified if possible. Surely the students of these middle and junior high school teachers are being "shortchanged" as they are unable to benefit from the enhanced instruction provided by the use of technology in the classroom.

The second finding that needs to be addressed is the available technology that is not being utilized. As stated previously 12 teachers who reported having one or two computers in their classroom indicated that they never use computers for student instruction. In addition, 19 teachers who reported having a computer lab at their school stated they never use the lab with their students.

This study did not address specific details on how technology is being used in the classroom. The questionnaire used for the study was intentionally designed to be brief and easy to complete in an effort to maximize the response rate as suggested by Fowler (1993). Future studies might include a survey instrument with short-answer and open-ended questions to obtain more specific information regarding the technology use of the teachers in the Florida classroom.

As stated above, a large percentage of teachers participating in this study indicated an interest in additional inservice training in the use of instructional technology. The importance of teacher training in the use of technology cannot be understated. As reported by Jones (1991) and Byers (1992) this inservice training should allow teachers to participate as much as possible. A quasi-experimental study investigating the effectiveness of "hands on" inservice training workshops in the use of instructional technology (computers, CD-ROM and laser videodisc) could be conducted in the future.

As stated by Scrogan (1989), technology is a tool for improving instruction but technology is not self-implementing. A great deal still needs to be accomplished to obtain the complete and effective integration of technology in the classroom. Ideally, at some time in the near future, 100% of teachers in Brevard County and throughout the state of Florida will be using instructional technology with their students on a regular basis.

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