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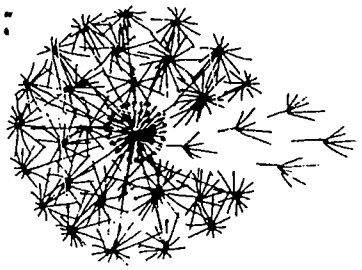
ABSTRACT

This report begins with an overview of the Utah Educational Technology Initiative (ETI) that describes the state's financial commitment to educational improvement through educational technology, the ETI allocation process, the requirement that school districts and colleges of education match ETI funds with locally-generated funds or in-kind services, and ETI funding by district. Previous evaluation reports are described, and findings from the 3-year course of this evaluation are reported in the following areas: ETI impact on student achievement and motivation; ETI impact on student access to technology; the nature of student computer use; teacher computer utilization; efforts to support technology use; program implementation and outreach; teacher competence with educational technology; and ETI at colleges of education. Three remaining challenges are presented in conclusion: (1) to continue to support teachers through inservice training and other means so they can take advantage of the instructional opportunities offered by computers; (2) to provide funds necessary for hardware maintenance and upgrading; and (3) to continue to communicate the vision of a technology-enhanced education and to invite the participation of teachers and students at all levels. (MES)



BERYL BUCK INSTITUTE FOR EDUCATION

"Knowledge exists to be imparted" Ralph Waldo Emerson

The Utah Educational Technology Initiative Evaluation Update

January 1994

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The Utah Educational Technology Initiative Evaluation Update: January 1994

Utah's Financial Commitment to Educational Improvement Through Educational Technology

Over the past decade, the State of Utah has made significant and substantial investments in educational technology. Beginning with the Productivity Grants in 1981, money has been made available to school districts for technology procurement and implementation, and has been used to initiate numerous technology projects. With the passage of the Utah Educational Technology Initiative (H. B. 468) in 1990, and its modification in 1991 (H. B. 344) and 1992 (H. B. 252), the Utah Legislature has increased its commitment to educational technology and the belief that such technology has the potential to increase student achievement, improve school functioning, influence curriculum change, contribute to teachers' professional growth, and help create an informed, capable, and productive work force.

Since 1990, the Utah Legislature has appropriated approximately $49.8 million to fund the Educational Technology Initiative (ETI). Of this total, approximately $43 million has been given to Utah school districts for the purchase of educational technology and the training of teachers to use this technology. The remainder of these funds are allocated to Utah's public colleges of education.[1]

ETI Allocation Process

The ETI legislation allocates money to individual school districts who have submitted a districtwide plan for the use of Educational Technology Initiative funds. These plans must be approved by the ETI Steering Committee before funds are released. Once a district's plan is approved, it is funded based on a two-part formula. The first part of the formula provides districts with a base allocation of 25% of ETI funds earmarked for K-12 schools. During the 1990-1991 school year, this amounted to $83,531. For the next three school years, the per-district allocation was $73,519, $60,150, and $47,957.

The second part of the formula allocates the remaining 75% of ETI funds earmarked for K-12 schools. In the fall of the year preceding the allocation, the total average daily membership of Utah's 40 school districts is calculated. Seventy-five percent of ETI funds earmarked for K-12 schools is then divided by the total average daily membership of Utah schools to yield a per student allocation.

Table 1.1 illustrates the results of the allocation formula over the course of the Educational Technology Initiative. As can be seen, the average per-student ETI allocation has decreased steadily from $30.67 during the 1990 - 1991 school year to $17.05 during the current school year. This decrease reflects a consistent reduction in total ETI funding between 1990 and 1994,

a steady increase in student enrollment, and the decision to allow the Utah Schools for the Deaf and Blind to participate as a school district in the Educational Technology Initiative. Summing expenditures over the four-year course of the Educational Technology Initiative, we find a total per-district expenditure of $265,157 and a total per-student expenditure of $94.54.

School Year	Total ETI Funding	Per District Allocation	Enrollment on October 1 of Previous School Year	Remaining Allocation	Average Per-Student Expenditure
1990-1991	$15,000,000	$83,531	435,762	$10,023,750	$30.67
1991-1992	$13,900,000	$73,519	444,732	$8,222,240	$25.10
1992-1993	$11,000,000	$60,150	454,218	$7,398,850	$21.72
1993-1994	$9,900,000	$47,957	461,259	$5,898,763	$17.05

Note: Enrollment figures taken from State Office of Education Records.

Table 1.1: ETI Legislative Funding, 1990 - 1994

ETI Funding "Match"

From the beginning, ETI Legislation has required school districts and colleges of education to match the Utah Educational Technology Initiative funds they receive on a one-to-three basis with their own locally-generated funds or through in-kind services, including the establishment of necessary infrastructure, planning services, training services, maintenance or technical assistance. Utah businesses and technology vendors have also contributed to the Utah Educational Technology Initiative through grants and by selling hardware and installation services to school districts and colleges at discounts or by providing staff training and other support services. Through June 1993, these matching funds are estimated by the ETI Project Office to be $81,805,162, based on reports submitted by district ETI Coordinators.[2]

From project inception to date, total ETI funding has been $49,800,000. We estimate total matching funds at the end of the 1993 - 1994 school year will be $100,551,435. Taking these two figures together, we calculate Utah's total investment in educational technology from the 1990 - 1991 to the 1993 - 1994 school year is $150,351,435, or approximately $325.96 per student.[3]

ETI Funding by District

Table 1.2 displays the dollar amounts received by Utah school districts from the 1990 - 1991 to the 1993 - 1994 school year.

Districts	1990-1991 Funding	1991-1992 Funding	1992-1993 Funding	1993-1994 Funding	Total Funding
Alpine	964,513	846,230	701,770	564,388	3,076,901
Beaver	114,609	101,445	83,547	66,212	365,813
Box Elder	331,623	293,018	243,734	192,623	1,060,998
Cache	364,342	323,129	266,399	210,651	1,164,521
Carbon	205,330	177,429	146,380	114,853	643,992
Daggett	87,664	77,370	63,363	50,430	278,827
Davis	1,312,141	1,143,665	965,219	773,331	4,194,356
Duchesne	178,808	154,330	128,725	103,794	565,657
Emery	166,606	144,824	119,016	93,103	523,549
Garfield	109,228	95,290	78,639	62,768	345,925
Grand	118,069	101,864	85,287	68,538	373,758
Granite	1,857,247	1,620,614	1,337,772	1,055,150	5,870,783
Iron	202,958	178,480	149,198	120,085	650,721
Jordan	1,545,897	1,367,890	1,151,921	927,199	4,992,907
Juab	119,579	104,862	86,505	68,955	379,901
Kane	116,470	102,273	84,080	66,603	369,426
Logan	207,810	186,222	153,207	122,684	669,923
Millard	170,461	148,449	123,338	97,730	539,978
Morgan	123,866	110,381	90,817	72,920	397,984
Murray	228,115	200,957	169,235	134,613	732,920
Nebo	459,716	404,527	337,160	271,477	1,472,880
N. Sanpete	135,883	119,620	97,647	78,335	431,485
N. Summit	104,183	91,902	75,693	60,181	331,959
Ogden	350,284	306,143	257,616	205,046	1,119,089
Park City	123,309	114,182	97,199	81,493	416,183
Piute	92,169	80,969	66,570	53,032	292,740
Provo	381,542	340,844	277,964	219,287	1,219,637
Rich	95,895	84,222	69,214	55,226	304,557
Salt Lake City	632,559	564,672	465,808	367,255	2,030,294
San Juan	162,263	142,793	114,724	91,042	510,822
Sevier	192,340	169,140	142,276	111,286	615,042
S. Sanpete	144,317	128,734	107,154	85,818	466,023
S. Summit	107,462	94,632	78,858	62,492	343,444
Tintic	88,651	78,132	64,062	51,030	281,875
Tooele	246,955	215,352	180,967	142,783	786,057
Uintah	228,545	194,636	169,108	133,640	725,989
Wasatch	151,441	132,723	111,751	87,962	483,877
Washington	375,978	345,158	290,620	238,322	1,250,078
Wayne	98,249	86,290	70,631	55,888	311,058
Weber	667,923	589,607	495,027	391,161	2,143,718
Sch Deaf & Blind	0	0	66,739	55,614	122,353
Total Across All Districts	13,365,000	11,763,000	9,865,000	7,865,000	42,858,000
Average Across All Districts	334,125	294,075	240,610	191,829	1,045,317

Table 1.2: ETI Funding of Utah School Districts, 1990 - 1994

As can be seen, total funds per district have ranged from $278,827 (Daggett) to $5,870,783 (Granite). The average funding per district over the four-year period has been $1,045,317.

In addition to the yearly ETI allocation, during the 1993 legislative session, a bill was passed authorizing a line item expenditure of $1,000,000 for renewal and replacement of equipment purchased by school districts with ETI funds. The distribution of these funds across Utah school districts and the Utah Schools for the Deaf and Blind is shown in Table 1.3.

District	Renewal and Replacement Funding	District	Renewal and Replacement Funding
Alpine	72,462	N. Sanpete	10,054
Beaver	8,384	N. Summit	7,643
Box Elder	24,246	Ogden	25,929
Cache	26,479	Park City	10,736
Carbon	14,216	Piute	6,720
Daggett	6,424	Provo	27,968
Davis	99,021	Rich	7,010
Duchesne	13,229	Salt Lake City	46,547
Emery	11,622	San Juan	11,386
Garfield	7,942	Sevier	13,947
Grand	8,645	S. Sanpete	11,006
Granite	132,617	S. Summit	7,906
Iron	15,426	Tintic	6,483
Jordan	118,879	Tooele	18,024
Juab	8,724	Uintah	16,762
Kane	8,421	Wasatch	11,151
Logan	15,760	Washington	31,267
Millard	12,324	Wayne	7,038
Morgan	9,293	Weber	49,761
Murray	16,910	Sch Deaf & Blind	7,059
Nebo	34,579		
Total Across All Districts			1,000,000
Average Across All Districts			24,390

Table 1.3: ETI Renewal and Replacement Funding of Utah School Districts, 1993 - 1994

Previous Evaluation Reports

This document is the fourth in a series of evaluation reports documenting the implementation and impact of the Utah Educational Technology Initiative.

The initial report, *A Portfolio-Based Evaluation of Utah's Educational Technology Initiative: 1990 - 1991 School Year* (Report # ETI-92-1) was issued in January 1992. Based on extensive site visits and a survey of all Utah schools receiving ETI funding, the report described the planning and implementation of district ETI projects and examined the impact of ETI on student performance and student access to computers during the 1990-91 school year. A second report, *Instructional Utilization, Teacher Training and Implementation of Utah's Educational Technology Initiative in School Districts and Colleges* (Report # ETI-92-2), was issued in June 1992. Based on site visits and a survey of 1483 teachers actively involved in the Educational Technology Initiative, it described the training teachers received and their use of technology for instructional purposes. This report also portrayed how colleges of education were preparing both today's and tomorrow's teachers to use educational technology. A third report, *The Utah Educational Technology Initiative Year Two Evaluation: Program Implementation, Computer Acquisition and Placement, and Computer Use* (Report #ETI-93-1), presented data from a survey distributed during October, 1992, to every elementary, junior high, middle, and high school in Utah.

Summary of Evaluation Findings

In this section, we summarize the findings that have accumulated over the three-year course of this evaluation. Although we have surveyed Utah schools each year to inquire about the impact of the Educational Technology Initiative, we have not, by design, repeated an identical set of questions. We have focused on specific areas in one year, and neglected them the next year to gather information on another concern. At the same time, we have consistently polled the schools regarding the hardware they have available for students and teachers, since hardware acquisition has been a major goal of ETI. The findings below focus on a variety of areas and demonstrate how the Educational Technology Initiative has supported the efforts of teachers and administrators to integrate computer technology into the instructional process and educate Utah students.

ETI Impact on Student Achievement and Motivation

- School district personnel believe they have seen important changes in student learning, motivation, and performance as a result of ETI projects.

- We used 5th grade scores from the 1993 Utah Statewide Testing Program to examine the relationship between the duration of computer-assisted instruction in different subject areas and student achievement. In general, the amount of time students spent working on a computer did ***not*** predict achievement test scores. However, after controlling for the effects of student socioeconomic status and teachers' perceptions of the school's effectiveness (this included quality of administrative leadership; quality of communication with

parents; commitment to school achievement; expectations for student learning; climate for learning; professionalism of faculty; and teacher morale), a mild but statistically reliable relationship emerged between time spent doing math on a computer and 1993 math achievement test scores. More time learning math using a computer was associated with higher 1993 mathematics achievement test scores. However, time spent doing math on computer was a less powerful predictor of math achievement test scores than either the percentage of low income students in the school or teachers' perceptions of the school's effectiveness.

- Elementary schools scoring below the mathematics and reading scores predicted for them on the Utah Statewide Testing Program in 1990 were more likely to score above their predicted mathematics and reading scores in 1991 if they had ETI projects operating for at least one semester.

ETI Impact on Student Access to Technology

- Over the course of the Educational Technology Initiative, the average number of computers in the classrooms of a typical elementary school increased 228% from approximately 5 to 18 computers. There was a similar increase in the average number of computers in the computer lab from 14 to 28.

- Over the course of the Educational Technology Initiative, the student-to-computer ratio in elementary schools has declined from 22:1 to 14:1. In secondary schools, the student to computer ratio has declined from 15:1 to 10:1.

- In October 1993, elementary and secondary schools in urban districts had more computers in computer labs than schools in either suburban or rural districts. Secondary schools in urban districts had more computers in classrooms than schools in either suburban or rural districts.

- In October 1993, more than one-third of the computers in elementary classrooms and computer labs were Apple IIe's or Apple IIgs's. In high schools, one-fourth of the computers in classrooms, and one-tenth of the computers in labs were Apple IIe's and Apple IIgs's. These machines are limited in their capabilities and are no longer manufactured.

- In October 1993, secondary schools in rural districts had a significantly lower student-to-computer ratio (6:1) compared to schools in urban (11:1) or suburban (15:1) districts. There was no significant difference in student-to-computer ratios among elementary schools in rural, urban or suburban districts.

- In October 1993, the typical elementary school owned 49 instructional computers. It did not own a modem, a LCD projection plate, a scanner or science probeware. On the other hand, one laser and 10 dot matrix printers, 105 regular and one graphing calculator, 8 VCR's, and 2 video disk players were available for instructional use. These are average figures and there was wide variation from school to school.

- In October 1993, the typical secondary school owned 110 instructional computers. In addition, a modem, a scanner, two LCD plates, two video disk players, four laser and 21 dot matrix printers, 18 VCR's, 49 regular and 21 graphing calculators were available for instructional use. These are averages and there was wide variation from school to school.

The Nature of Student Computer Use

- In the 1991-1992 school year, teachers reported brighter students used computers more than slower students, and boys used computers slightly more than girls. This tendency was especially pronounced in the middle/junior high school grades and in early high school grades.

- In the 1991-1992 school year, student computer use increased in a linear fashion as a function of grade level. For example, the average student in kindergarten, first- or second-grade used computers approximately 57 minutes per week, while the average student in grades 11 or 12 used computers approximately 130 minutes per week.

- In the 1992-1993 school year, elementary students most frequently used computers for keyboarding and drill and practice. Secondary students most frequently used computers for keyboarding and word processing.

- In the 1992-1993 school year, 5th grade students used the computer most for drill and practice exercises and word processing. More advanced computer use with interactive or open-ended software was relatively infrequent, and the use of computer technology for class presentations and telecommunications was extremely rare.

Teacher Computer Utilization

- Teachers' use of computers in different subject areas is strongly correlated with their belief about computer effectiveness.

- In the three-year period from 1989-1992, teachers actively involved in the Educational Technology Initiative doubled the amount of time they spent using technology for instructional purposes. Elementary teachers increased from an average of 1.3 hours per week to an average of 3.0 hours per week, and secondary school teachers increased their average use from 3.4 hours to 7.8 hours per week. By the end of the 1991-92 school year, this trend leveled off, with teacher computer use remaining the same or dropping slightly. In both elementary and secondary schools, teachers in the higher grades reported using computers significantly more than teachers in the lower grades.

- During the 1990-1991 school year, elementary teachers actively involved in the Educational Technology Initiative used computers considerably more to support mathematics instruction than to support reading or writing. Secondary teachers actively involved in the Educational Technology Initiative used computers significantly more to teach writing than for reading or mathematics.

- During the 1990-1991 school year, the majority of instructional computer use by elementary teachers actively involved in the Educational Technology Initiative was in support of the Utah Core Curriculum. Over 80 percent of these elementary teachers used computers to instill basic skills through drill and practice. Sixty percent of these same teachers used computers for stimulating creative and higher order thinking. Fewer than 15 percent used the technology as a presentation or telecommunications medium. Basic skills and drill practice continued to be emphasized over higher order thinking during the 1992-1993 school year.

- During the 1990-1991 school year, over 70% of secondary school teachers actively involved in the Educational Technology Initiative reported using computers for word processing. About 60% used computers for drill and practice, for the development of basic skills in the core curriculum and for developing higher order thinking skills. About one-third of these same teachers used technology as a presentation medium. Sixteen percent utilized computers for telecommunications. Word processing continued to be the most frequently mentioned teacher computer use among secondary teachers in the 1992-1993 school year.

- In October 1993, elementary teachers reported that they generally did not purchase the software they used most frequently. Instead, it was already at the school. High school

teachers were more likely to report that they had ordered their most frequently used software after seeing it used elsewhere.

Efforts to Support Technology Use

- In November 1991, approximately 45% of teachers actively involved in the Educational Technology Initiative reported they received no formal inservice training to support the integration of technology with their instruction. A further 34% received less than 10 hours of formal inservice training. These figures do not include the amount of time teachers may have helped each other informally or learned on their own. By the beginning of the 1992-1993 school year, the percent of teachers reporting they had not received any kind of inservice training in technology decreased to 18%, and the percent of teachers reporting they had received less than 10 hours of training decreased to 13%.

- During the 1990-1991 school year, the average teacher receiving inservice training in technology spent almost twice as much training time focusing on integration into the areas of writing and mathematics instruction as was spent on integration with reading instruction.

- In October 1993, elementary teachers actively involved with the Educational Technology Initiative reported they had received an average of 55.9 hours of inservice training from all sources in technology use and integration over the course of the Initiative. Junior high/middle school teachers actively involved in ETI reported receiving an average of 65.3 hours, and high school teachers actively involved in ETI reported receiving an average of 94.2 hours of inservice training.

- During the 1992-1993 school year, elementary and junior high/middle school teachers received the greatest amount of inservice training from university courses and university faculty with district personnel (not from the school) providing the second greatest amount.

- During the 1992-1993 school year, high school teachers received the greatest amount of inservice training from university courses. District personnel were the second most prevalent inservice providers. These results stand in contrast to the 1990-1991 findings, when very little training was being provided by universities.

- During Summer 1993, 40% of the elementary schools and 61% of the secondary schools allowed teachers to take computers home for the summer. Eighty-nine percent of the elementary

schools and 38% of the secondary schools allowed teachers to use computers at school. Fifty-five percent of elementary schools and 62% of the secondary schools conducted technology inservice programs for teachers.

- In October 1993, a majority of principals selected site-based staff development as the most effective mechanism to support teachers who were not computer literate. Also popular was the idea of paying teachers stipends or providing release time to take computer classes or experiment with computers, placing computers in teachers' classrooms, and buying software more closely matched to the curriculum. District-directed staff development, giving teachers the use of a computer during the summer, or buying more "user-friendly" software were not selected as support mechanisms as frequently as the other options.

- In October 1993, 28% of elementary and 17% of secondary schools reported that the entire faculty had participated in technology inservice during the previous school year.

Program Implementation and Outreach

- In October 1993, approximately 60% of both elementary and secondary schools reported they would like to upgrade or replace up to 50% of their current hardware and software.

- In the initial years of ETI, schools reported numerous hardware, software and network problems and felt hampered by the available expertise of school staff. Current implementation concerns focus on continued staff training, and hardware repair and upgrading.

- In October 1993, 13% of the elementary schools and 44% of the secondary schools reported one or more incidents of hardware theft or vandalism during the previous school year. One percent of the elementary schools and 3% of the secondary schools reported 5 or more such incidents.

- In October 1993, 4% of the elementary schools and 24% of the secondary schools reported one or more incidents of software theft or copying during the previous school year. No elementary schools and 1% of the secondary schools reported 5 or more such incidents.

- In October 1993, 68% of the elementary schools and 79% of the secondary schools reported one or more incidents of equipment failure during the previous school year. Eleven

percent of the elementary schools and 21% of the secondary schools reported five or more such incidents.

- In October 1993, 62% of the elementary schools and 70% of the secondary schools reported they had to take equipment off site for service at least once during the previous school year. Five percent of the elementary schools and 15% of the secondary schools reported they had 5 or more incidents of equipment failure requiring off-site service.

- During the 1992-1993 school year, most schools spent the majority of ETI funds on hardware purchases, with substantially smaller expenditures for software, repairs and inservice. The typical elementary school spent approximately $10,474 for hardware, $3,010 for software, $940 for repairs, and $941 for inservice training. The typical secondary school spent $23,531 for hardware, $4,699 for software, $1,859 for repairs, and $1,280 for inservice training. These are averages and there was considerable variation from school to school.

- During the 1992-1993 school year, 71% of the elementary schools and 77% of the secondary schools hosted opportunities for parents to see teachers and students using educational technology. Ten percent of the elementary schools and 16% of the secondary schools lent computers to students for use over the summer.

- During the 1993-1994 school year, 46% of the elementary schools and 89% of the secondary schools give students access to their computer facilities before and after school. The average elementary school made their computer facilities available less than 3 hours a week. The average secondary school made their computer facilities available just over 6 hours a week.

- During the 1993-1994 school year, we would find 8 students and 3 parents using the computer facilities of the average elementary school before or after school each day. In the average secondary school, we would find 22 students and 9 parents using the computer facilities before or after school each day.

Teacher Competence with Educational Technology

- During the 1993-1994 school year, the average elementary school reported that 70% of the faculty were competent using drill and practice software, 36% of the faculty were competent using open-ended software, 66% of the faculty were competent using word processing software, 27% were competent using

technology for instructional presentations, and 16% of the faculty were competent using email and computer telecommunications. Compared to the 1992-1993 school year, there was a greater number of teachers competent to use technology in each of the above categories.

- During the 1993-1994 school year, the average secondary school reported that 55% of the faculty were competent using drill and practice software, 34% of the faculty were competent using open-ended software, 70% of the faculty were competent using word processing software, 31% were competent using technology for instructional presentations, and 29% of the faculty were competent using email and computer telecommunications. Compared to the 1992-1993 school year, there was a greater number of teachers competent to use technology in each of the above categories.

ETI at Colleges of Education

- In October 1992, professors at Utah colleges of education reported that ETI had been especially effective in providing technology to meet professional needs, enabling professors to develop more creative and effective instruction and increase their teaching effectiveness, and in generally improving preservice teacher training in technology.

- In October 1992, professors at Utah colleges of education judged ETI less effective in encouraging interdepartmental and inter-college collaboration and e-mail communication, and increasing professor's skills in diagnosing student weakness and tracking progress

- In October 1992, there were statistically significant differences among the perceptions of professors at different colleges of education regarding ETI's impact. Southern Utah University faculty were consistently more positive about ETI's impact on professors' teaching, the preservice technology training teacher candidates received, and the training Colleges of Education faculty received to integrate the technology in their teaching. Faculty of the University of Utah reported that ETI had a substantial impact on their use of e-mail.

- In October 1992, professors at Utah colleges of education reported that they used computers for word processing more frequently than for any other purpose. A slight majority of professors (53%) reported they used e-mail for communications at least once a week. Approximately 38% reported using computers to make instructional presentations at least once a week. Approximately 31% reported they

accessed computer bulletin board at least once a month. Approximately 40% of the respondents reported they NEVER used computers for grading and recordkeeping.

- In October 1992, there were statistically significant differences among the different colleges of education in the frequency with which professors used computers for different purposes. Professors at the University of Utah reported using e-mail more frequently than professors at all other schools. Professors at USU reported using e-mail more frequently than professors at SUU or WSU. Professors at Southern Utah University reported using computers to keep grades and other student records more than professors at the other schools. Professors at USU reported using computers for grading and recordkeeping more than professors at U of U and WSU. Professors at Southern Utah University and Utah State University reported using computers for instructional presentations more than professors at the University of Utah.

- All of Utah's colleges of education have increased faculty interest in and use of educational technology, and have updated teacher and administrator training programs to include technology. All colleges have strong university support for technology integration.

- All of Utah's colleges of education have sophisticated student computer labs.

- Each university has several faculty members working to develop courses that model multi-media instruction.

- Three colleges of education have created partnerships with nearby public schools to assist them in technology integration, and all colleges of education provide inservice training in technology. One school has concluded a summer technology workshop for superintendents.

From the Evaluator's Perspective

The Educational Technology Initiative continues to have a positive impact on Utah education. It has made a major difference in the quality and quantity of hardware and software available to teachers and students. In past evaluations, we have pointed to the importance of inservice training to realize the potential of the investment made thus far in hardware. We continue to believe more inservice is necessary. At the present time, it is in the more basic uses of computers that most teachers are competent. More and more teachers, however, are receiving inservice and other forms of technology support. Principals report more teachers each year are competent technology users. The number of teachers using technology in sophisticated ways continues to

grow. Colleges of education are doing their part to train preservice teachers and modify their curricula to model and include technology. Utah is making significant progress toward creating a technologically literate teaching force.

We believe three challenges remain:

- To continue to support teachers through inservice training and other means so they can take advantage of the instructional opportunities offered by computers.
- To provide funds necessary for hardware maintenance and upgrading.
- To continue to communicate the vision of a technology-enhanced education, and to invite the participation of teachers and students at all levels.

Endnotes

1 Further discussions of the influence of the Educational Technology Initiative on Utah's public colleges of education can be found in Mergendoller, J.R.; Stoddart, Trish; Horan, Carolyn; Niederhauser, Dale; and Bradshaw, Dean (1992). *Instructional Utilization, Teacher Training and Implementation of Utah's Educational Technology Initiative in School Districts and Colleges* (Report # ETI-92-2). Novato, CA: Beryl Buck Institute for Education.

2 Given the recordkeeping format established in the beginning of the Educational Technology Initiative by the ETI Project Office, matching fund calculations include monies contributed for ETI projects in both school districts and colleges of education. Consequently, the matching funds attributable to school districts are somewhat overstated. It is impossible to disaggregate school district and college of education matching funds, but one can estimate the matching funds attributable to each source according to their proportionate legislative funding. Out of a total of $49.8 million of ETI funds disbursed between 1990 and 1994, school districts received approximately $43 million, the ETI Project Office received $600,000, and colleges of education received approximately $6.2 million. If matching funds are divided in the same manner, we would expect school districts to have provided $89,703,562 and colleges of education to have provided $10,847,872 in matching funds.

3 Through June 1993, ETI matching funds are reported by the ETI Project Office to be $81,805,162. The 1990 - 1994 total matching funds of $100,551,435 matching funds reported in the text assumes that the amount of matching funds for the 1993 - 1994 school year will equal those contributed during the 1992 - 1993 school year.