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TECHNOLOGY AVAILABLE TO IOWA TEACHERS THROUGH AREA EDUCATION AGENCIES

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Recently, we have, as a nation, come to realize the vital need for technology literacy among our citizens if we are to cope in a global society. Iowa educational leaders are striving to gain a competitive edge in this area. Working for this edge, the Iowa Department of Education has hired a technology consultant, and guides are being refined to help educators address the topic in their curricula. Standards have been adopted by the State Board of Education relative to telecommunications in Iowa classrooms. The Iowa standard for incorporating technology into curricula is as follows:

12.5(10) ... The Board [of each school district] shall adopt a plan for the efficient and effective use of technology in the instructional program. The plan shall provide for the understanding and use of current technology by staff and students and shall include a procedure to review the district's utilization of technology as a teaching and learning tool (Bureau of School Administration,1988).

Definitions are being refined to help assure common terminology. *New Standards for Iowa's Schools: Guidelines for Interpretation* defines "technology" in the following manner:

Applied science; improvements in technical processes that increase productivity of machines and eliminate manual processes (p. 69).

Steering a state in technology education, however, is difficult when the leadership is armed with legislation only. The Department of Education technology consultant must have ready access to strategic equipment and be ready and able to assist Area Education Agency (AEA) and Local Education Agency (LEA) specialists.

In April 1990, an Eisenhower Amendment grant was awarded to Drake University to help "infuse technology into the mathematics and science curricula." The funds were from Department of Education administrative and technical assistance portions of these programs. The purpose of the grant is to help AEAs work with LEAs to meet general state requirements and their own technology initiatives in math and

science. Specifically, it is to do the following:
(1) secure state-of-the-art educational technology.
(2) provide training programs for Iowa Department of Education and AEA personnel in the effective use of the hardware and software for applications in mathematics and science.
(3) establish a loan program for AEA personnel to use the equipment for technology infusion workshops for LEAs within each respective area.

In addition, the grant is to encourage the merging of these efforts with related projects such as the People Sharing Information Network (PSInet) (Gerlovich, 1990).

A committee of six educators convened to review the technology for application in mathematics and science curricula in Iowa schools. Table 1 is a list of the equipment, software and video programs which were selected for the training and loan program. Some fairly common items were secured for loan; however, some unique items were also found to be very effective. The Canon Zapshot camera, for instance, enables a picture to be taken of a person or item and then digitized into a Macintosh or IBM program through the "computer eyes" program. The picture can then be built instantaneously into newsletters or other documents.

Table 1
Technology for Loan to Teachers through AEAs
(Numbers in parentheses indicate the number
of items available for loan throughout the state)

Hardware

Apple CD-ROM w/cables (1)

Toner Cartridges for Laser (2)

Pioneer LVD 8000 Videodisc Player (1)

Pioneer LVD 2200 Videodisc Player (2)

Pioneer Bar Code Reader -- remote (2)

Pioneer Infra-red remote for LVD 8000 (1)

CANON Zapshot Still Video Camera (4)

CANON Zapshot Miscellaneous Accessories

ComputerEyes Video Capture Hardware (5)

Toshiba CD-ROM w/card, etc. [IBM] (2)

Sayett Datashow LCD for Macintosh/IBM (1)

MacRecorder Sound Digitizer (2)

LogicTech 4" Hand Scanner (2)

Magnavox Color Monitor (w/ sound; 3)

Radio Shack speakers (3)

Software/Media/Etc.

Chemistry at Work Videodisc (1)

Chemistry at Work HC Stacks (1)

Chemistry at Work Linkway Folders (1)

For All Mankind Videodisc (1)

Voyager Gallery Videodisc (1)

Periodic Table Videodisc (2)

Periodic Table Videodisc HC Stacks (2)

Ducks Unlimited Videodisc (1)

Doing Chemistry Videodisc (1)
Planetscapes Videodisc (1)
Space Shuttle Videodisc (1)
Windows on Science -- EARTH Videodisc (1)
Windows on Science -- LIFE Videodisc (1)
Windows on Science -- PHYSICAL Videodisc (1)
Encyclopedia of Animals Videodisc Set
Frog Anatomy and Physiology Videodisc (1)
The National Zoo Videodisc (1)
Insects Videodisc (1)
Dinosaurs Videodisc (1)
First National Kidisc Videodisc (1)
Bio Sci II Videodisc (1)
Bio Sci II HC Stacks (1)
Bio Sci II HC Linkway Folders (1)
The Great Quake '89 Videodisc (1)
The Great Quake '89 HC Stacks (1)
The Voyager VideoStack Software (1)
VideoStack 8000 Extension Software (1)
Discus Scary Poems -- CD-ROM (1)
Discus Peter Rabbit -- CD-ROM (1)
Discus Princess (Spanish) -- CD-ROM (1)
Time Table of Science -- CD-ROM [MAC] (1)

The Whole Earth Catalog -- CD-ROM [MAC] (1)
Science Helper -- CD-ROM [IBM] (1)
Science and Technology Reference Set -- CD-ROM [IBM] (1)
World Atlas -- CD-ROM (1)
Ziphias National Directory -- CD-ROM [MAC] (1)
Clip Art -- CD-ROM [MAC] (1)
HyperCard Stacks -- CD-ROM [MAC] (1)
Grolier's Encyclopedia -- CD-ROM [MAC] (2)
Cosmic Osmo -- CD-ROM [MAC] (2)
World Fact Book -- CD-ROM (1)
BodyWorks -- MacKids (1)
EarthWorks -- MacKids (1)
Turbo Math Facts -- MacKids (1)
VisiFrog -- Vertebrate Anatomy (1)
Broderbund Science ToolKit (1)
IBM PSL (Starter PAK) (2)
Lego-Logo Starter Kit (1)TI Graphing Calculator (2)
TI Graphing Calculator Overhead Unit (2)
Sunburst-Broken Calculator [Macintosh] (1)
LinkWay [IBM] (2)
Mac Bar'n'Coder (1)
Voyager CD AudioStack (1)

A half-day equipment orientation program was conducted for Department of Education (DOE) personnel in early September 1990. DOE consultants were very excited about the potential for improving technology education throughout the state. There seemed to be a consensus that Iowa can, and should, be a leader in this field as it is other areas of education. State consultants have said they are seriously constrained in their work by a lack of funds and strategic equipment. Grant funding restrictions have prevented them from obtaining technology equipment with non-state funds, but grant projects (such as this effort) can provide excellent systems for supplementing DOE activities.

Another one-and-one-half day program was offered for AEA personnel in late September 1990. Twenty-eight AEA consultants at-

tended this workshop in Ames. At the conclusion of this well received program, the consultants were uniformly eager to conduct similar workshops in their respective service areas. All equipment items were demonstrated, and their use in science and mathematics programs (K-12) was discussed. A loan program was outlined for AEA personnel to follow in checking out the equipment from the DOE technology consultant. The loan program is now promoted and updated electronically via PSInet. AEAs can also check a calendar of use for the equipment through the DOE technology consultant (via PSInet).

The AEA consultants were found to be generally well informed regarding current educational technologies. They were also eager to assist teachers in learning about and implementing these technologies into teaching. The workshops provided them with additional specific knowledge and skills as well as hardware and software available on loan for teacher workshops in their areas.

After working with the technologies at the workshop, the AEA consultants were asked to rate the potential for improving mathematics and science education in Iowa using these loaned equipment items. The results are listed in Table 2.

Table 2
Technology Item Evaluation

Item Evaluated	Percent of Consultants Rating Item:		
	High	Medium	Low
<u>Computer Software</u>			
Computer Assisted Instruction			
(CAI)	59	41	0
Database	65	35	0
Spreadsheet	44	56	0
Simulation	64	56	0
Hypermedia Authoring	65	29	6
<u>Probeware</u>			
Broderbund Science ToolKit	92	8	0
IBM Personal Lab	93	0	7
<u>Telecommunications</u>			
PSInet	75	16	9
<u>Others</u>			
CD-ROM	84	16	0
Laserdisc	89	11	0
Video Still Camera	28	56	16

The program will enable AEAs economically to offer technology orientation days for LEA science and mathematics personnel. AEAs may secure items for regular loan to schools, and teachers are encouraged to make requests for such items to their AEAs.

Technology is destined to become a larger part of every facet of our present and future personal and educational lives. This program will enable effective orientation and integral use of strategic pieces of equipment without unnecessary expense to any one entity.

For additional information, contact Jack Gerlovich (ph. 515-271-3912; PSInet GERLOVICH) or Becky Timmerman (ph. 515-281-4803; PSInet DETECH).

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