

IMPROVING STUDENT PERFORMANCE
WITH PERSONALIZED COMPUTER-BASED
DELIVERY AND MANAGEMENT OF INSTRUCTION

WILLIAM C. NORRIS INSTITUTE

December 9, 1988

Introduction

This proposal describes a program to implement an individualized approach to the educational process that uses computer-based technology as the primary mode of instructional delivery and management. At its foundation is the full implementation of an individualized, technology-based approach to the education process. The major objectives of the program are to achieve improvement in the academic performance of students and to level off the ever-rising costs of education.

A primary feature of the program is the "technology core," which consists of the computer hardware, software, and courseware used to deliver and manage instruction. To achieve the best learning outcomes at the lowest cost, the technology core for each participating school will have the same essential components, but they may be configured and used somewhat differently depending on the school.

At each participating school, the initial program will consist of three consecutive grade levels between the 4th and 9th grades, with the total number of students served determined by local conditions. At least one consecutive grade level will be added each year, so that students are provided an ongoing program with the same format. For example, if grade levels 4, 5, and 6 are the original sequence of grades, grade 7 will be added in year 2, and grade 8 in year 3. Eventually, it is anticipated that the approach will be implemented throughout the K-12 continuum.

The educational program will include learning objectives, learning resources, mastery criteria, and evaluation techniques approved by the school district. For all categories of students enrolled in the program, overall group achievement results are expected to exceed the results of comparable student groups enrolled in the regular instructional program.

Program Components and Features

The new program will include the following components:

1. A personalized learning plan for each enrollee.
2. Local professional staff, trained to diagnose, prescribe, and facilitate learning with computer-based technology.
3. The technology core consisting of computer-based education equipment, software, and learning resources to provide computer-managed and computer-assisted instruction.

These components will be used to provide individualized computer-based education that incorporates mastery and standardized testing, continuous progress monitoring, and frequent reporting. The computer-managed learning environment will include software programs that assist in diagnosing, prescribing, and evaluating instruction and performance for individual students. Computerized administrative and other non-instructional processes and services will be integrated into the program as fully as possible.

Individualized Learning Approach

The education format of the proposed program is based on a transformation from traditional group learning to individualized education. In the new format, each student will be assessed and diagnosed by a local team of teachers and the student's parent(s) to ascertain his/her strengths, weaknesses, needs, and capabilities. Team consensus will determine an individual's learning plan, designed to identify the student's current achievement status and to move him/her along a prescribed progress path. The learner will follow the plan at a rate and pace appropriate to individual capabilities, unrestricted by the rate and pace of a group.

In an individualized learning environment, the student can benefit from all of the resources typically available in the traditional classroom environment, including large and small group sessions, books and other print media, films, audio and video tapes, computer-assisted programs, seminars, and teachers. The essential difference between individualized and group learning resides in the personalized plan that guides each learner and is based upon his/her abilities, potential, and needs. The learning activities are supervised by the teacher, the student's progress is monitored, and the individual plan is adjusted whenever necessary to enhance performance. Individual students are measured by their progress within their own learning plan, rather than against a group norm. Other performance measurements may be determined by the school districts.

With the aid of computer technology, teachers are freed from the restrictions of the traditional group learning environment to work with individual learners and small groups. Their primary focus becomes the individual student rather than the group progress norm. Much of the non-teaching, classroom management chores and functions that consume valuable teacher time in the traditional format are managed by the technology. Teachers will be thoroughly trained and oriented to function effectively in the transformed school.

Financial Considerations

The program's instructional and operational costs, exclusive of startup costs, are planned not to exceed the established district per pupil allocations. The costs will be monitored by a Cost Review Committee, composed of representatives of education and business. A program budget will be drawn up in conformance with a set of agreed upon accounting standards.

The local school district will continue to provide:

1. The site, facilities, equipment, noncomputer-based education learning resources, utilities, maintenance, transportation of students, and other usual educational support services.
2. The district-wide per pupil allocation based on the number of students enrolled in the program.

Once selected for participation in the program, the school district will receive:

1. Funding to underwrite costs involved in startup, including staff and program preparation and management.
2. Funding for the technology core (hardware, software, courseware) required to implement the program.

Participating schools will receive an average of \$216,000 to cover most of the costs of program startup, training, and technology. Actual costs associated with the technology core will vary from district to district, depending on the extent to which educational technology is already in use.

Program Management

The method of program management will be determined by individual participating districts. School administrators can participate in advanced management training and opportunities to broaden their experience and expand their ability to incorporate technology in education. Alternatively, private companies can manage the program under contract.

Evaluation

Overall group achievement results for students enrolled in the program are expected to exceed achievement results of comparable student groups within the district. A Performance Review Committee, composed of education experts, will objectively evaluate student achievement data and overall program performance. Continuous individual and group progress monitoring and reporting will provide parents and school district officials with current information on program and student performance.

In addition to reviewing student achievement and overall performance, the costs of operation for each transformed school will be monitored and evaluated by the Cost Review Committee.

Individual School District Commitments

Each participating school will agree to conform to a common set of program standards and will document all program-related plans, activities, and results. This information will be available to all other participating schools. Districts will also be expected to implement their programs in ways that will be replicable in other districts with similar characteristics. Participating schools will form a consortium and meet regularly for planning, evaluation, and information exchange.

Transformed Schools as Distinguished from Technology Demonstration Sites

The Technology Demonstration Sites program was a significant effort, sponsored by the State Department of Education, to emphasize the importance of educational technology. The attached chart distinguishes this prior program from the Transformed Schools program, which establishes a consortium of transformed schools utilizing a technology-based approach to create an individualized learning environment.

Why Minnesota Should Appropriate Funding for Transformed Schools

The Transformed Schools program is a natural progression from previous initiatives. Transformed schools would make possible the improvement and restructuring of education by permitting the creation of an individualized learning environment. The program's full integration of technology would leverage Minnesota's previous financial and personnel investments to achieve, among its goals, the State's goal of outcome-based education.

Transformed Schools as Distinguished from Technology Demonstration Sites

Transformed Schools

Purpose: To operate technology-based, total school environments utilizing individualized education as the prescribed learning format. To achieve improved learning quality, equity, and cost-effectiveness and catalyze replication throughout Minnesota.

Proposed Number of Sites: Fifteen (15)

Selection Criteria:

Quality and creativity of school district's proposal
Geographic distribution throughout Minnesota
Large school district/small school district selection
Rural/Urban school district distribution
Examples of three-year continuums that span the K-12 continuum

Description:

Each transformed school will utilize the individualized learning format, with technology as the basic tool to manage and deliver instruction. Initially covering a three grade level span, the transformed schools will add at least one grade level in each subsequent year of operation until the K-12 spectrum is available. Learners will progress at a rate and pace according to a custom-designed personal learning plan devised by local educators with input from the student and his/her parent(s) or guardian(s).

Goals: To reach or exceed anticipated improvements in the quality, equity, and cost-effectiveness of learning by typical cross sections of students utilizing the individualized, technology-based format and process. To disseminate evaluation data and to assist conversion to the transformed school by additional districts. To refine the format and assist in its evolution to a comprehensive pre-school through undergraduate continuum.

Budget: \$4 million

Technology Demonstration Sites

Purpose: To demonstrate the effectiveness of a wide variety of educational technologies in different settings. To provide opportunities for visitors to observe the use of technology "in action."

Number of Sites: Seventeen (17)

Selection Criteria:

Quality and creativity of school district's proposal
Geographic distribution throughout Minnesota
Large school district/small school district selection
Rural/Urban school district distribution
Examples of a variety of technologies

Description:

Collectively, the demonstration sites display the use of various forms of technology that provide supplemental teaching/learning opportunities and experiences. The technologies are utilized within the learning environments without impacting the traditional organizational structure or group learning format. The varied technology tools serve to augment, to enhance, and to provide alternative learning modalities within the total education service to the school district's students, staff, and citizens.

Goals: To discover through use and ongoing experience the advantages of various technologies and applications, and their potential for expansion within districts and replication in other Minnesota districts. To disseminate evaluation data and provide interested school districts with information concerning their adoption of technology and its appropriate integration.

Budget: \$4.4 million