Project LOCAL — Bridging the Gap

Robert N. Haven
Project LOCAL
200 Nahatan Street
Westwood MA 02090

Abstract

Project LOCAL, a not-for-profit regional consortium, offers a broad spectrum of in-service training courses tailored to meet the needs of educators in various disciplines and levels of experience. The purpose of these offerings is to bridge the communication gap between innovative centers in computer-oriented education and staff members in Boston area schools.

The number of schools trying to use the computer in instruction is increasing but the computer's potential is not being fully realized. This is largely the result of a scarcity of adequate information and training to prepare school staff members who want to use computers in instruction.

In LOCAL's curriculum, teachers and administrators can obtain an introduction to computer-oriented techniques in a variety of areas.

Introduction

Project LOCAL[1] is somewhat unusual among educational institutions in that information dissemination in the field of computer-oriented education is its primary role and teacher education is the most important part of that role. LOCAL offers a broad spectrum of courses tailored to meet the needs of educators in various disciplines and levels of experience. Teachers and administrators can get an introduction to computer-oriented techniques in the areas of mathematics, physical and biological sciences, social studies, business education, elementary education, guidance, and administration, as well as in-depth training in instructional modes using simulation, drill and practice, dialog, and advanced programming.

The other facets of LOCAL's dissemination program include a library containing documents, computer programs, and audiovisual materials, a widely read newsletter, and bimonthly "briefs" describing computer teaching applications. The rationale for this program and its teacher education component are outlined below.

Rationale

Computers can and do fulfill a wide variety of functions in instruction, and good results are obtained if they are employed in a knowledgeable way. This contention is the basic premise upon which our entire program is built, and the "if they are employed in a knowledgeable way" is the key phrase of this premise.

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[1] Project LOCAL is a regional consortium of Boston-area school systems set up to provide support services for computer-oriented education. It began in 1967 as a Title III ESEA Project; it became a not-for-profit corporation in 1970 and is supported entirely by school systems to which it provides services.

It is apparent that many school systems in New England and across the country are trying to use computers in instruction, and their numbers are increasing steadily. Unfortunately, such increases in quantity do not mean that the computer's potential is being fully realized. In most schools, there are very few terminals, and usage is limited to only one or two applications. Darby (1970) found that problem-solving and EDP skills training were reported almost three times as frequently as any other application. These are certainly valid applications, but they do not by any means cover the entire spectrum of computer-oriented techniques.

Although expense is a factor, probably the biggest obstacle in the way of growth in this field is the very small amount of information and training received by school staff members trying to use computers in instruction. A 1972 Project LOCAL survey found that most educators in New England public schools were not familiar with even the names of major innovative programs in computer-oriented education, much less the materials developed by such programs. In a 1972 report to the National Science Foundation, the Committee on Computer Education of the Conference Board of the Mathematical Sciences [3] made the following points about the status of computer-oriented instruction in U.S. schools:

1. Curriculum materials are available from a variety of sources but are not widely used.

2. Many schools are preparing their own materials but inter-school communication of innovations is not very effective; wheels continually are reinvented.

3. The need for easy access to detailed information is critical.

The problem seems to be the age-old one of communication, which in this case represents a failure to transmit the good strategies and programs from the innovative centers to the only place where they have any value--the classrooms of our schools.

Unfortunately, the usual formal communication channels have not been much help. Schools of education and other university departments have provided very little training for teachers in how to use the computer in their work [1,3]. Clearly, state and federal agencies have not done enough. Textbook publishers have been unwilling to commit sufficient resources to this area to make a significant impact.

Fortunately, some of the professional societies have been doing a good job of facilitating communication, notably National Association of Users of Computer-Assisted Learning, Association for the Development of Computer-Based Instructional Systems, and the Special Interest Group in Computer Uses of Education of the Association for Computing Machinery. Additionally, a very pleasant surprise is the help coming from computer manufacturers, especially Digital Equipment Corporation and Hewlett-Packard, both of whom are publishing newsletters, resource materials for computer-oriented teaching, and computer programs useful in instruction [4,5]. And publications such as Educational Technology, People's Computer Company, and those cited in the Educational Resources Information Center (ERIC) System are available.

Project LOCAL is a grass-roots attempt to do something about bridging the communication gap. We see ourselves as a linking agency between innovative centers all over the country and staff members in the schools of our region. We try to make sure that school people are aware of the good materials and strategies that are available, and then we attempt to stimulate their interest in using these materials and strategies. Moreover, we endeavor to give them the skills and understanding necessary to make such usage possible. And then, we try also to support those who want to develop

their own products. In the future, we hope also to be able to provide feedback from the classroom to developers.

LOCAL's Training Program

As indicated above, LOCAL's in-service training program is the cornerstone of our over-all dissemination program. It provides a way of imparting a body of knowledge in a consistent and organized fashion so that it may be put to use in the classroom and used as a framework for future growth. Moreover, it does a job that no other component can perform on a respectable scale: bringing the educator into direct confrontation with the computer and giving him sufficient concrete experience so that he will feel justified and comfortable in using it. Books, newsletters, and other media may send out the necessary information, but we have found that direct and prolonged encounter with the computer is the only medium which has a fair chance of ensuring that it is used. Also, for many educators, scheduled classes are the only way to overcome the inertia of established, comfortable patterns, and even fear, which may prevent them from trying out an innovation even though it may be widely publicized as being quite effective.

Course Offerings

The courses offered currently by LOCAL are listed in Table 1. Note that they vary in length from 4 to 20 hours and carry recommended increment credit from none to 2 semester hours. Because most schools in our area are unwilling to provide released time for outside training, courses ordinarily are given in the late afternoon; however, other schedules are available on request. Several courses concerning equipment selection and installation, and computer applications in guidance and administration, also are offered but are not discussed here.

Awareness

Course G1, The Potential of the Computer in the Instructional Process, is our primary vehicle for developing awareness and, to some extent, stimulating interest. This is a 4 1/2-hour mini-course for the teacher or administrator who has had little or no experience with the computer. The single session is organized around techniques useful in any discipline but draws examples from several subject areas. It emphasizes student problem-solving, simulation and games, drill and practice, and social implications of the computer. We try to maximize hands-on experience at terminals using dialog-oriented programs.

Programming

Once an educator becomes aware of the computer's potential and is interested in working with it, the next step is usually to learn a programming language. In course G2, we teach the fundamentals of BASIC in combination with very simple educational programming applications. The format is split about evenly between lecture-discussion sessions and independent study with one or more self-teaching texts.

At this stage, it is imperative that the student (educator) spend the greatest possible amount of time writing, debugging, and executing programs. This is necessary in order to accomplish one of the goals referred to above, i.e., to ensure that he is comfortable using the computer. He must develop his confidence to the point where he is not afraid to take programming into the classroom. In any consideration of maximizing access to the computer, one advantage of a regional organization becomes apparent: teachers have

access to computers not only in our Westwood headquarters, but also in any of our member schools which may be more convenient to their homes.

Table 1. Project LOCAL Course Offerings[2]

	Name	Hours	Recommended Credit (Sem. Hrs)
General			
G1	The Potential of The Computer in The Instructional Process	4.5	none
G2	Introduction to Programming in The BASIC Language	16	1.5
G3	Teaching Advanced Programming Topics	20	2.0
G4	How to Justify Computer Equipment for Instructional and Administrative Use	6	0.5
G5	Selecting and Acquiring Computer and Communication Facilities for Instruction	10	1.0
G6	Writing Computer-Administered Drill and Practice Dialogs in BASIC	10	1.0
G7	Using Simulation in Teaching Secondary Science and Social Studies	10	1.0
G8	Designing and Implementing Computer-Based Simulations for Use in Social and Physical Sciences	16	1.5
G9	Fundamentals of Computers and Assembly Language	20	2.0
Mathematics			
M1	Introduction to Using the Computer in Teaching Secondary Mathematics	20	2.0
Science			
S1	Introduction to Using the Computer in Teaching Secondary Science	20	2.0
Social Studies			
SS1	Introduction to Using the Computer in Teaching Secondary Social Studies	20	2.0
Business Education			
BE1	Introduction to Using the Computer in Business and Data Processing Courses	20	2.0
Elementary Education			
E1	Introduction to Computer-Oriented Instruction in the Elementary School	20	2.0

[2] Most are accredited for salary increment purposes by school systems in LOCAL's region; E1 is offered under the auspices of Lesley College, Cambridge, Mass.

Guidance			
GU1	Selecting and Acquiring College and Vocational Information Services	6	0.5
Administration			
A2	Doing Pupil Assignment and Attendance Accounting on Rented Computer Time	4	none

In the near future, we hope to convert the large-group, lecture-discussion portion of Course G2 to a combination of independent study and small-group units. The entire course then will be coordinated by a newly developed clerical support system which administers tests, generates drills, and monitors and reports student progress. Not only will this be a valuable aid to the course instructor, but it will give participants an appreciation for the benefits of one of the more sophisticated instructional applications of the computer.

Introductory Applications

For the teacher who does not wish to get involved, at least initially, with programming, LOCAL offers one course in the use of "packaged" programs: G7 Using Simulation in Teaching Secondary Science and Social Studies. This ten-hour offering includes in-depth coverage of the materials produced by the Huntington Project (State University of New York, Stony Brook) and published by Digital Equipment Corporation [4]. It is our hope, of course, that these sessions will stimulate teachers interested in acquiring the tools necessary to create applications of their own choosing.

Concrete classroom aplications of the computer are introduced in LOCAL's courses for specific disciplines: M1 (mathematics), S1 (science), SS1 (social studies), BE1 (business education), and E1 (elementary education). All of these courses, for which BASIC programming skill is a prerequisite, are designed to equip participants to critically evaluate potential computer teaching applications in terms of their objectives and the capabilities and limitations of their hardware and software environments, to develop strategies for using existing software, and to develop simple programs of their own. All of the following types of applications are considered: student problem-solving, drill, simulations and games, and teacher clerical aids, as well as social implications of the computers. Curriculum materials currently available are surveyed, such as those produced by the Colorado Project [6], the Huntington Project [4], Project SOLO [7], Program REACT [8], the CMCP Computer Extended Mathematics Project, and others.

"Advanced" Topics

LOCAL's curriculum also includes a number of offerings for the educator who wants to go beyond fundamentals. Course G3 covers the use of advanced programming techniques in application areas such as information retrieval, linear programming, statistics, and other topics in applied mathematics. G6, Writing Computer-Administered Drill and Practice Dialogs in BASIC, includes topics such as relevant educational psychology, random generation of problems, analysis of student responses, adjusting problem difficulty to student performance, and recording and reporting student performance. The identification, design, and implementation of models for computer-based simulations and games are the subject of course G8. Finally, G9 is designed for the teacher who would like to learn about computer operation and assembly language programming.

Project LOCAL's Impact

As indicated above, Project LOCAL is attempting to fill a communication gap between schools in its region and researchers and developers in the field of computer-oriented education. Farr saw this as a need in all facets of education and coined the name "linker" for the agency to bridge the gap:

> Seldom, however, is the producer of a bit of knowledge responsible for inserting it in and propelling it through the "knowledge flow system". And probably this is a good thing... The most productive research is not usually conducted by the man who bears the everyday responsibilities of teacher or administrator, nor is the best teaching done by researchers. Rarely can these two functions be carried out well by a single individual, but neither the researcher nor the teacher can do his best work in ignorance of the other. Here is where the linker comes in. [10]

By its very existence and continued successful operation, LOCAL serves as a model, not only for the computer education field, but for other areas of education as well. Apparently, this is an attractive model, as the Project has received extensive coverage in several different journals and directories which in turn has resulted in over 1,100 inquires from all over the world and more than 100 visits by parties of educators from the U.S. and nine foreign countries.

LOCAL has had a substantial impact on its member school systems. In 1967, computer-oriented activities in Project schools involved only about five teachers and 100 students--all in high school mathematics. By 1974, 100 teachers and over 5,000 students were involved on a regular basis. Although Project LOCAL began as a secondary school level program, five elementary schools and several junior high schools have begun to apply the computer in teaching. Moreover, a variety of modes of computer use has proliferated. Another indication is the enrollment in our in-service training program, which increased five times over in the period 1971 through 1974; LOCAL has trained teachers from over 60 school systems in the last seven years. The Project hopes to continue and expand this grassroots effort to help New England schools realize the computer's potential in the instruction process.

References

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[3] Recommendations Regarding Computers in High School. Conference Board of the Mathematical Science Committee on Computer Education, 1972.

[4] Educational Products Catalog. Digital Equipment Corp. Communication Services, PK-1, Maynard MA, 1974.

[5] Hewlett-Packard Educational Users Group Newsletter. Cupertino, CA.

[6] Second Course in Algebra and Trigonometry with Computer Programming. University of Colorado, (Colorado Schools Computer Science Curriculum Development Project), 1969.

[7] Solo Works. Project SOLO, University of Pittsburgh.

[8] Computer Oriented Curriculum, Program REACT (NWREL). Tecnica Education Corp., Salt Lake City, 1971.

[9] CMCP Computer Extended Mathematical Science Project, University of Denver.

[10] Farr, Richard S. Knowledge Linkers and the Form of Educational Information. ERIC Clearinghouse on Educational Media and Technology, 1969. University of Denver, Colo.