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ABSTRACT
        This proceedings compilation presents papers on
administration, computer literacy, computer science, desktop
publishing, elementary education, hardware and software, language
arts, mathematics, media, music and art, science, social studies, and
special education. The 130 papers are arranged alphabetically by
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Proceedings

9th Annual State Conference

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Texas Computer Education Association

TECHNOLOGY:

Window To The Future

Conference Proceedings

edited by

George W. Bright
Mary Louise Grigassy

Texas Computer Education Association

Ninth Annual State Conference

March 5-7, 1989

George R. Brown Convention Center
Houston, Texas

Introduction

The theme of this conference, **Window to the Future**, represents the view of TCEA about the importance and the relevance of technology to education. The papers in this Proceedings Book will provide you not only with the perspectives of some of today's practicing professionals about where technology may be headed but also with useful information to help you move toward your personal view of the future role of computing in education.

The Proceedings Book is the official record of the presentations made at the 1989 TCEA state-wide conference. But these contributions are only abstracts of the real interactions each speaker intended to occur. You are encouraged to read between the lines to imagine the full impact of each presentation.

This Proceedings Book could not have been completed without the cooperation of all the speakers who made contributions. Thanks go to each one of them for their efforts. Special thanks, too, go to Arnold Goldberg, who designed the cover, and to Mary Louise Grigassy who maintained the files of papers, developed the database from which the Table of Contents and Index were created, and managed the communication with each of the contributors. It has been a pleasure to work with her.

George W. Bright
University of Houston
1989 January 30

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The Best Software Titles of 1988 and how to choose and
buy them.

FOREST BARBIERI
2360 Hassell Rd. Hoffman Estates,Il.   60195

Review of the top twenty titles and the three desktop
publishers. Which one of the titles best meets
educator's needs.

A brief description of the top twenty software titles
available, and how to choose them. Once a title has been
selected we will explain were to purchase the software
so that the persons buying will get the best for their
money.

The three best desktop publishers will also be reviewed.

Integrating Mathematics Software into the Curriculum

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Integrating mathematics software into your curriculum is an excellent way to offer students the opportunity for additional instruction. Slow learners can develop their skills and build confidence using the computer which acts as a patient tutor. The computer can accomplish this by guiding the student through the formulas, step-by-step, helping them to understand the concept and independently work out the problems. All this is done at the student's own pace, creating a positive learning experience.

Average learners will profit from using the computer, too. In problem areas the computer can offer extra skills practice, and in areas of expertise, it will confirm the student's self-confidence and independence.

Computers can also offer challenges to fast learners and help maintain their interest level by enabling them to learn at their own pace. It will keep them busy learning while you, the teacher, help the slower students.

Because your students' needs are individual, the best software is that which is flexible enough to adjust to different levels and varying needs. In addition, as educators become more familiar with computers, they desire curriculum-based software to expand and enhance their approved courses of study. Curriculum-based software should purposefully and systematically match specified instructional objectives or learner outcomes. The mo st effective curriculum-based software can simultaneously reinforce a cluster of related skills. Here are several suggestions on using software that are not traditionally associated with mathematics:

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Crossword Magic can be used in a variety of ways to add pep to your mathematics classes. Students learning numeration will enjoy filling in cross number puzzles that test their knowledge of translating from words to numerals. Examples will be shown.

Crossword puzzles are also ideal for testing addition, subtraction, multiplication and division skills, equation expertise and Roman numerals. Examples will be shown.

Another teacher tool recommended for the mathematics classroom is Surveys Unlimited. This program creates surveys, analyzes research results and strengthens students' critical thinking skills. It helps students develop a true understanding of the importance of numbers to the business world. Examples will be shown.

If you're really feeling adventurous and creative, two other programs will add alot of fun to your mathematics classroom. Riddle Magic, a program that teaches how to develop riddles, can be used to test knowledge of mathematical terms. Examples will be shown.

Poetry Express, which teaches and guides beginning poets through eight different poetry styles, adds a new twist to the math curriculum. Students can write a poem about their mathematics class or write specifically about a particular type of math. Here's an example of a Diamante poem, which is diamond shaped and does not usually rhyme. It's special appeal comes from describing two contrasting nouns and showing a connection between them. Perfect for geometry! Examples will be shown.

As you can see, software that stretches across ability levels and the curriculum can be used in a variety of creative ways.

However, more traditional mathematics software certainly plays a significant role in developing the basic skills of students. As mentioned earlier, the computer acts as a patient tutor with those students in need of extra practice, and also keeps pace with the agility of the quick learners. Examples will be shown.

Computer Literacy in the
Dallas Independent School District

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        In response to the statement from the
Department of Technology at the Texas Education
Agency that each district would need to have a plan
in place by September of 1989 for implementing
keyboarding in the elementary grades, DISD
appointed a committee to develop standards and a
plan for implementation.

        In earlier computer literacy plans in the Dallas
Independent School District LOGO had been the primary element.
but in schools where instruction actively occurred some
additional elements were in place including computr awareness,
word processing and some other random areas of computer
instruction (keyboarding, programming in BASIC, etc.).
        Hardware used consisted of Commodore 64's. Each
elementary school received five Commodore keyboaras, five
monitors, one drive and a switch.
        Each school was supplied with software to teach LOGO and
training was provided for two persons per building. The
training consisted of two half-day sessions on LOGO. No
specific assignment was made as to who was to assume
responsibility for implementing at the individual schools.
although implementation was to begin at Grades 2 and 3.
        For the largest part, this attempt at structuring literacy
instruction was unsuccessful unless there was a person in the
enthusiastic enough to take responsibility for either training
teachers to teach their students or teaching the students
themselves. Frequently the media coordinator or librarian was
the one held responsible for maintaining and ordering software
and hardware and also was responsible for assuming the
instructional role.
        When the committee was chosen to begin working on
standards and an implementation plan to comply with the
expected TEA directive it was composed of two media
coordinators and a computer specialist. Computer specialist
positions exist at nine DISD schools -- those schools that have
a reduced student-teacher ratio and special programs as a
result of court-ordered desegregation. The computer specialist
at these schools assumes responsibility for scheduling.
hardware and software maintenance. and training of facuity.

Some student instruction is done, but only in specified areas. A large amount of time at these special schools is spent on computer assisted instruction.

The committee agreed that a five year plan for implementation would need to be developed with changes in staffing, funding and materials purchasing, but a plan for year one would need to be written that would allow implementation with staffing and materials currently in place. The most critical part of the implementation plan as far as funding was that it was suggested that the Commodore computers be phased out as they became irreparable and replaced with Apple II's.

Instruction was written in four strands. These were:
1. Computer Awareness
2. Keyboarding
3. Word Processing
4. LOGO

The literacy standards that were written included a scope and sequence standards, lesson plans and an implementation plan. Although they are incomplete at present, the intent was that the staff who implemented at the building level would receive a complete package with all materials necessary to teach the lessons. They also would receive training for implementation with on-going training for increasing their level of competency and allow them to take their students beyond the minimum standards.

No new software was required for the original implementation. Keyboarding would be taught using Bank Street Writer and then this same piece of software would be used for word processing. LOGO software in already in place in each building.

The intent of the staffing plan was that media coordinators would be trained and they would be responsible for training teachers in their buildings to be instructors of their own students. As media coordinators, this is a reasonable of their role.

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TECHNOLOGY AND THE SECONDARY MATHEMATICS CURRICULUM

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Technology has revolutionized life in most sectors of our society. The need to know how to use technology effectively in this information age is no longer limited only to students who plan to become scientists or engineers, but is also needed by all students. In addition, computers and related technologies have changed the way we use mathematics; consequently, efforts are being made to update the mathematics curriculum to meet the challenges of the imperatives of technological change.

Education has passed beyond the stage of teaching about computers to the stage of integrating computers into the curriculum. Yet for the most part, their use remains tied to the standard curriculum. This does not take into account the changing demands of today's society and the potential of computer-related technology in the instructional process.

Several groups propose changes in the mathematics curriculum with the aim that "the new curriculum reflect the needs of all students, who spend their adult lives in a society increasingly dominated by technology and quantitative methods." Among those groups recommending restructuring of the mathematics curriculum are the National Council of Teachers of Mathematics, the Mathematical Sciences Education Board, and the American Association for the Advancement of Science. Some of their preliminary recommendations are:

- use computers and hand-held calculators in all grades to improve students' problem-solving skills
- actively involve students in "doing" math
- increase use of mathematical models
- demand less memorization of isolated facts and acquisition of routine skills
- emphasize greater conceptual understanding and problem-solving
- increase emphasis on applied mathematics
- include broader range of statistics, probability, and measurement
- integrate topics traditionally taught under discrete subject, such as algebra and geometry

Most mathematics teachers now recognize that the technology revolution should have affected their professional lives by now and that some knowledge of computers should have been acquired. But educational change is slow. If meaningful change in the mathematics program is to be accomplished, preservice and inservice programs must reflect changes in the mathematics curriculum and must teach how the tools of computer technology can be used to develop and expand students' understanding of mathematics.

HOW WE USE OUR WRITING LABS IN COMAL ISD

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Comal ISD has a 15 station Macintosh-Plus writing lab in the library of each high school. The librarians and language arts teachers work together to encourage the students to learn and use word processing in their classes. The goal of the writing lab is to improve writing skills at the high school level as well as to introduce the students to the use of technology as a tool.

"Little evidence supports the widely-held belief that good attitudes toward computers result in better attitudes toward school work and higher achievement. An exception to this trend is the use of word processing, which seems to make students consistently feel more positively toward writing and want to write more." (T.H.E. Journal) Comal ISD installed Macintosh writing labs in their high schools in order to take advantage of the chance to change students' attitudes toward the writing process.

The district is emphasizing writing from kindergarten to high school starting with Writing To Read labs in K - 1, Apple II labs in 2 - 5, Apple IIGS labs in middle school, and Macintosh labs in high school. This is the first year that all the labs in all the schools are operating. Keyboarding is being emphasized as a prerequisite to word processing enabling the student to become more efficient as well as building good keyboarding habits.

The first step in learning to use the Macintosh writing labs, was to teach the teachers, as well as the students, how to use MacWrite, with the spelling component, as a word processor. The teachers and librarians worked together to schedule the English classes into the writing labs. The first day was spent working through the tour that comes with the Mac. The next day, the students were introduced to word processing. They were given an assignment to correct and were able to learn editing techniques as they completed the task.

Then the students were given projects to work on by the teachers. These projects will be described by a librarian and an English teacher from each school since their approaches to utilizing the lab are different.

Canyon High School introduced the writing lab in the English classes, giving the students an opportunity to use the computers during their writing time. The Correlated Language Arts classes used the Mac labs regularly to perform word processing. Some students actually composed essays for the first time.

Smithson Valley High School introduced the Macintoshes as part of the freshman library unit, making the students aware of the writing lab as an integral part of the library. The freshmen also used the computers to publish a Shakersperian newspaper. The other classes were introduced to the writing lab when the teachers could schedule the students.

Overheads and handouts will be used to illustrate the work done by the students.

"The Effectiveness of Microcomputers in Education: A Review of the Research from 1980-1987," T.H.E. Journal, September 1988, Santa Ana, CA 92705, pp.85-89.

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TEXT EDITING WITH MAC

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Beyond checking spelling, what can this proofing program do? If the computer gives the student all the answers, what need is there for the teacher? You will get concrete answers to these questions this hour as you and the Macintosh "Proof" student papers.

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MANAGEMENT STRATEGIES FOR MICROCOMPUTER INTEGRATION IN SPECIAL EDUCATION CLASSROOMS

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MICROCOMPUTERS IN SPECIAL EDUCATION HAVE EMERGED AS A SIGNIFICANT INSTRUCTIONAL MECHANISM. THIS INTEGRATION OF TECHNOLOGY HAS PROLIFERATED DEVELOPMENT IN A MYRIAD OF WAYS, IN ORDER TO UTILIZE COMPUTERS WITH THE SPECIAL NEEDS LEARNER. THIS PAPER WILL CONCENTRATE ON MANAGEMENT APPROACHES RELATIVE TO MICROCOMPUTER INTEGRATION IN SPECIAL EDUCATION CLASSROOMS. MAJOR TOPICS FOR DISCUSSION WILL INCLUDE: 1. THE COORDINATION OF SOFTWARE AND INSTRUCTIONAL DEVELOPMENT; AND 2. TEACHER/STUDENT APPLICATION AND TIME MANAGEMENT STRATEGIES.

THE CONVERGENCE OF MICROCOMPUTER TECHNOLOGY AND THE EDUCATION OF EXCEPTIONAL LEARNERS HAS REVITALIZED THE FORMAT BY WHICH WE AS EDUCATORS IMPLEMENT AN INSTRUCTIONAL PROGRAM. THIS TECHNOLOGICAL INFUSION NOT ONLY HAS GIVEN NEW MEANING TO FACILITATING LEARNING, BUT HAS PRODUCED COUNTLESS POSSIBILITES FOR PROFESSIONAL GROWTH. PLANNING AND MANAGEMENT STRATEGIES BECOME ESSENTIAL FACTORS FOR THE IMPLEMENTATION OF SUCCESSFUL COMPUTER INTEGRATION BECAUSE OF THE DIVERSE AND UNIQUE NEEDS OF EXCEPTIONAL LEARNERS. AS EDUCATORS BEGIN TO EMBRACE COMPUTER INTEGRATED CONCEPTS, ONE MUST CONSIDET MANY COMPONENTS OF THIS PROCESS.

INITIALLY, EDUCATORS MUST SET THEIR PERSONAL AND STUDENT GOALS, ASKING THEMSELVES HOW THEY WOULD LIKE TO USE THE COMPUTER WITH THE STUDENTS IN OR OUT OF THE CLASSROOM. THEY MUST THEN BECOME PROFICIENT WITH THE COMPUTER IN ORDER TO DETERMINE ITS INSTRUCTIONAL VALUE TO THE STUDENT'S ABILITY LEVEL AND ASSESSING THE COMPUTER'S CAPACITY TO SERVE EACH STUDENT IN THE CLASS. FOR EXAMPLE, THERE IS A DISTINCT CHANCE THAT THE ADDITIONAL HARDWARE MAY BE NEEDED TO GIVE ACCESS TO ALL TYPES OF EXCEPTIONALITIES. THE ASSESSMENT OF

THE CURRICULUM UTILIZED IN THE CLASS SERVES AS ONE OF THE
BASES FOR THE SELECTION OF APPROPRIATE SOFTWARE. THE
CRITERA FOR SOFTWARE SELECTION IS INVALUABLE AND SHOULD
CORRELATE WITH NOT ONLY INSTRUCTIONAL OBJECTIVES, BUT
STUDENT NEEDS. IF INAPPROPRIATE SOFTWARE IS UTILIZED, THIS
MAY HAVE A PROFOUND EFFECT ON INSTRUCTIONAL AND CLASS
MANAGEMENT PLANNING.

ALTHOUGH THERE ARE OTHER FACTORS TO CONSIDER WHEN SELECTING
SOFTWARE, AN EDUCATOR'S KNOWLEDGE OF STUDENT ABILITY AND THE
COMPONENTS OF THE CURRICULUM ARE VITALLY IMPORTANT. AS THE
EDUCATOR BECOMES MORE PROFICIENT, THE COMPUTER BECOMES A
MORE VIABLE, FLEXIBLE INSTRUCTIONAL AID. THIS IS WHEN
TEACHER/STUDENT APPLICATION AND MANAGEMENT STRATEGIES BECOME
INTERCONNECTED. THE EDUCATOR MAKES AN ANALYSIS OF THE
EXISTING CLASS MANAGEMENT SYSTEM, WHICH IS USUALLY AN
EDUCATOR'S PREFERENCE. THE UTILIZATION OF COMPUTER USAGE IS
INCORPORATED INTO THE PREEXISTING CLASS MANAGEMENT SYSTEM.
MODIFICATIONS ARE NECESSARY, BUT THERE ARE NUMEROUS WAYS TO
PROVIDE EACH STUDENT WITH SUFFICIENT TIME FOR COMPUTER USE
AS WELL AS INCREASE THE PRODUCTIVITY OF INSTRUCTIONAL
PLANNING.

IT WILL BECOME APPARENT THAT CERTAIN VARIABLES WILL HAVE AN
IMPACT ON ANY MANAGEMENT APPROACH. FOR INSTANCE, CLASS
SIZE, INSTRUCTIONAL LEVELS, SUBJECT AREAS AND CLASS CLIMATE
TO NAME A FEW. DEPENDING ON THE TYPE OF EXCEPTIONALITY, AN
EDUCATOR WILL NEED TO DETERMINE IF INDEPENDENT OR GROUP USE
WILL BE FEASIBLE, AND HOW TO INCORPORATE THE COMPUTER WITH
OTHER MEDIA MATERIALS. OVERALL, MANAGEMENT STRATEGIES CAN
REMAIN CONSTANT THROUGHOUT THE SCHOOL YEAR OR VARY BASED ON
THE NEED OR INSTUCTIONAL ACTIVITY. ONE SPECIFIC POINT IN
ANY MANAGEMENT APPROACH UTILIZED, IS THE INCLUSION OF
STUDENTS IN THE IMPLEMENTATION OF THAT APPROACH. USING
STUDENTS AS ASSISTANTS WILL ENCOURAGE RESPONSIBLE
INDEPENDENT OR GROUP USE OF THE COMPUTER, AND IT WILL GIVE
THE EDUCATOR FREEDOM TO INTERACT WITH THE STUDENTS NOT USING
THE COMPUTER.

FINALLY, APPROPRIATE MANAGEMENT STRATEGIES THAT WILL YIELD
POSITIVE RESULTS AND SUCCESSFUL PRACTICES FOR MICROCOMPUTER
INTEGRATION CORRELATES WITH EDUCATORS WHO ARE ENTHUSIASTIC
ABOUT THE RESERVOIR OF CHALLENGES AND OPPORTUNITIES GIVEN BY
THIS PHENOMENA. ONCE THESE STRATEGIES ARE INSTITUTED,
STUDENTS AND EDUCATORS WILL OBSERVE ANOTHER MEANS OF
BECOMING TRUE PARTNERS IN EDUCATION.

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Spice Up Your Programming Instruction

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Programming is difficult to learn, but there are a variety of models, analogies, and introductory activities that can help students learn more, learn faster, and remember better. This session is a presentation of some useful ideas taken from research, textbooks, workbooks, and personal experience. Sample overheads, posters, and worksheets are discussed.

There is considerable research evidence that programming is difficult to learn; teachers see evidence of this every day. Dalbey and Linn (1986) have specified a "chain of cognitive consequences" that seems to provide a reasonable framework within which to consider how to teach programming. There are three links in this chain: language features, design skills, and general problem solving skills. In an oversimplified view of this chain, we can thing of these three links as writing syntax, applying programming templates, writing complete programs. Significant experience seems to be required to move through the three stages. Indeed, it may not be possible for teachers to see significant pay-off from programming instruction until students reach the stage of general problem solving skills; students at either earlier stage may not know enough to transfer their knowledge effectively. Difficulties that students face in learning programming include remembering how particular commands function and knowing which template to apply in a particular situation. Models and analogies might help students learn more, learn faster, and remember better.

Analogies are acknowledged to be effective at helping students learn; Halpern (1987) demonstrated that analogies helped students learn about science, for both immediate learning and longer term retention. Although students still frequently come to programming courses as novices in terms of computer knowledge, they bring with them much information about the world. We can take advantage of some of this knowledge by emphasizing how programming is like, and different from, more familiar activities. For example, program can be compared with the directions for baking a cake; computer language can be compared with the traffic laws; variable can be compared with a seat on a bus. In a recent analysis of the computer science textbooks adopted for Texas, TenEyck (1988) reported that almost no analogies were used. Failing to do so leaves students up to their own devices in terms of relating new information to things that they know about. Clearly some students are very good at doing this, but others are not. It is the weaker students that will likely benefit most from a teacher's explicit use of analogies in class.

Mayer (1988) structured natural language comprehension problems as models for BASIC programs; a sample problem follows:

1. Ask the operator for a number and put that number in Box B.
2. Add 5 to the number in Box B.
3. Write down the number in Box B.
4. Stop.
If the operator gives the number 7, what is the output? (a) 2 (b) 5 (c) 7 (d) 12

Two experimental groups spent 50% or 25% of the instructional time studying these problems before beginning BASIC, while the control group spent 100% of the time on BASIC. The experimental groups performed better than the control group on the semantics of BASIC, possibly because the problems provided a structure in which students co·'ld assimilate knowledge about BASIC. The control group performed better with BAS'., syntax, but knowledge of superficial features without understanding of the underlying structure may be useless.

Schwartz, Niguidula, and Perkins (1988) developed supplementary materials to help teachers get fundamental programming concepts across to students. One of their models for the computer is a "data factory" in which various functions of the internal parts of a computer are conceptualized as "areas" where work is going on; e.g., screen area, scratch pad. A robot moves between these areas to carry out the instructions in a program. Other models help students learn to apply programming templates and to improve the transfer of their knowledge.

Conclusions

Instruction does make a difference on students' knowledge of programming; merely scheduling more computer time is not sufficient. But we have to plan effective lessons so that students develop cognitive models that will allow recall and use of knowledge. Programming teachers may never have had a methods course, so they may have not had the chance to think about alternate ways to teach the important concepts. Just as students need to know the underlying structure of programming, teachers need to kno·v the underlying structure of teaching techniques. Analogies form one coherent set of such knowledge, and models form another. The challenge for teachers is to translate research results into everyday instruction.

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Creative Language Arts and Math Activities on the Computer

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The computer in the classroom is a highly effective method for creative writing. Teachers can use the same teaching units they have always used. But instead of paper and pencils, let the students write directly on the computer.

For years, elementary teachers have been teaching creative writing successfully in the classroom. And with the added emphasis on the story writing part of the TEAMS test, the computer offers an exciting alternative to pencil drill and practice.

Most of us connect stories and art work. The students will draw a picture of a fireman, space capsule or giant dinosaur and then will write a story describing what they drew.

Students can do the same creative writing on the computer. Their story can be saved on the disk, printed, cut out and pasted on any picture (hand drawn or cut out of a book or magazine).

This method will work with any unit you teach and can be displayed with pride.

USING IBM's SOFTWARE AND A COMPUTER TO TEACHER ALGEBRA

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IBM's Algebra software is a function plotter and a symbolic manipulator. Examples will be given showing how to use the software to teach specific objectives to a class. some tutorials (not drill and practice) will be shown. The software will be used to guide participants to discovering a generality. Student response to this material is VERY positive.

IBM's Algebra Series can be used with Algebra I, Algebra II and College Algebra students. The students can work at their own pace as they go through the tutorials covering the basic concepts normally covered in either of the high school algebra courses. Review sessions, practice and tests are included as a part of the program.

The Algebra Series also includes a function plotter and algebraic symbol manipulator. Using this tool, students can explore algebraic ideas of their own choosing or investigate topics prompted through a series of teacher questions. For example, a general cubic equation can be divided so the cubic term has a coefficient of one. Graphing results in one of three situations: a curve that has a flat, step like level in it; a curve with one peak and one valley; or a curve that has one slightly noticeable inflection point. There is a relation between the coefficients of the squared and first degree terms that determines which of the three curves will be generated. Students can enter different cubic equations and discover the which coefficients will produce each of the graphs.

The cubic example would probably be best done at an individual level although it could be done with a group through careful teacher questioning. In this mode, the students would be expected to provide the teacher with equations which would then be graphed. Consideration would need to be given to the coefficients of the square and first degree terms and records kept of the type of graph generated by the various combinations. After an appropriate number of examples, a pattern and the initial question is answered.

The software can be used with a group display device to present the cubic equation question to a class or large group. This electronic blackboard concept can be used as a powerful teaching tool. Each tutorial in the software begins with one or more objective, followed by some examples, a generalization of

the concepts being presented, some guided examples, and explorations. With the electronic blackboard, the teacher now has an outline of a lesson plan. Each screen can be discussed with the necessary detail. Questions and examples are listed throughout each tutorial. These can be used to guide the discussion and prompt additional thoughts or examples which could be explored at the chalkboard, on an overhead, or with the computer projected via the electronic blackboard. Touching one key produces a smaller version of the function plotter and symbolic manipulator screen. Thus additional equations can be entered and graphed.

If a concept is not a part of the tutorials or if a person elects to introduce it in a different way, the software can still be used. The entire screen can be used to show the function plotter and symbol manipulator. At this point, the teacher can enter a desired sequence of statements, equations or examples. Student conceptualization can be enhanced by providing intuitive backgrounds through the graphs of situations. For example, suppose the line y= x intersect some curve, in the first quadrant and the coordinates of the point of intersection are to be found. The student could substitute and solve, getting the answer. However, does the student do the process mechanically or is it understood? Using the software, the students can magnify the portion of the graph in question and determine the coordinates of the point of intersection by moving a cursor, the position of which is given by x and y coordinates as it moves. A student who realized the coordinates must be the same because of the line y = x displays a deeper understanding of the problem.

The statements, examples, graphs and questions that would be associated with the circle and line example can be saved to a disk prior to the presentation. The information can be called from the disk and gone through one step at a time. This eliminates the need to type each thing, saves time, and does not take away from the presentation, allowing the class to focus on the matter at hand. Any step may be elaborated upon as needed to enhance the discussion.

Uses such as these make the computer a powerful teaching tool providing a flexibility that exceeds those normally found in a classroom. Frequently students will ask what some exotic equation would look like if graphed. We can discuss the graph in general terms and sketch approximations of it but often are limited as far as accuracy because of time or the inability to do an appropriate number of points. Using this function plotter, however, questions such as "What does this equation look like?" or "What are the zeros of this function?" can easily be graphed and answered. Ultimately, it provides the power to explore questions that previously had to be avoided because of typical classroom constraints.

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SCIENCE PROBEWARE

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The state of Texas requires our Science curriculum to devote 40% of its time to laboratory instruction. Technology offers unique and innovative solutions for this requirement. Probeware involves the students in the scientific method as they learn the concepts. This paper will discuss why probeware is desirable and what is available to the schools.

Probeware is the general term for a variety of computer peripherals that test the environment and our bodies for such properties as light, sound, temperature, humidity, and pulse rate. Probeware consists of both the hardware sensors and the software that allows the computer to directly measure physical variables.

There are many advantages to using probeware in the classroom:
1) Probeware has made it possible for students to do experiments that were difficult or impossible to perform in a traditional laboratory setting.
2) The computer is faster and more accurate than many traditional hands-on activities. The probeware can record the results of experiments that are too quick or minute for our senses to record.
3) The computer does many of the mechanical tasks of collecting and recording data, allowing the student more time for analysis of the experiment. Students can theorize, test their theories, make comparisons, and revise their theories without the tedium of stopping to record results.
4) Results of the experimentation may be displayed on screen or printed. These graphic displays reinforce learning.
5) The computer allows students to be more successful, faster; therefore, they can build positive attitudes toward science.
6) The computer can perform extended experiments without needing human supervision. This frees the students to take part in other class activities or return the next day for analysis.
7) Probeware makes it easier for disabled students to participate in experiments and document their work.
8) The use of a large screen monitor or LCD plate connected to the computer allows a whole group to view the results of the experimentation at one time.

The use of probeware can easily be cost effective. Computer probeware is relatively inexpensive, considering all that it will

do, when compared to other more traditional lab materials. When the computer is not being used with the probeware, it can perform other useful activities--such as writing reports or running science CAI software. Computers on carts can be used in other classrooms or in other subject areas.

There is a great deal of probeware on the market. A listing of some of these, separated by type, is given below. A more complete listing, with descriptions, will be distributed during the presentation.

Light probes:
  Science Tool Kit: Master Module (Broderbund, gr. 4-9)
  Voyage of the Mimi (Sunburst, gr. 4-8)
Sound probes:
  Frequency Meter (Vernier, gr. 9-12)
  Science Tool Kit: Master Module (Broderbund, gr. 4-9)
  Sound: A Microcomputer Based Lab (HRM, gr. 7-College)
  Voyare of the Mimi (Sunburst, gr. 4-8)
Temperature probes:
  Exploring Heat Through Lessons and Labs (D.C. Heath, gr. 4-6)
  Exploring Science: Temperature (Sunburst, gr. 6-12)
  Heat and Temperature: A Microcomputer Based Lab (HRM, gr. 6-12)
  Playing with Science: Temperature (Sunburst, gr. K-7)
  Science Tool Kit: Master Module (Broderbund, gr. 4-9)
  Temperature Plotter (Vernier, gr. 9-12)
  Voyage of the Mimi (Sunburst, gr. 4-8)
Speed/Motion probes:
  Motion: A Microcomputer Based Lab (HRM, gr. 6-college)
  Science Tool Kit: Module 1: Speed & Motion (Broderbund, gr.4-12)
  Science Tool Kit: Module 2: Earthquake Lab (Broderbund, gr. 7-12)
Biology probes:
  Biofeedback Microlab (HRM, gr. 9-12)
  Cardiovascular Fitness Lab (HRM, gr. 7-12)
  Experiments in Human Physiology (HRM, gr. 7-12)
  Learning to Cope with Pressure (Sunburst, gr. 4-12)
  Mind-Body Microlab (HRM, gr. 7-College)
  Science Tool Kit: Module 3: Body Lab (Broderbund, gr. 4-12)
Chemistry probes:
  Experiments in Chemistry (HRM, gr. 9-12)
  Experiments in Colorimetry (HRM, gr. 9-College)
Physics probes:
  Exploring Matter Through Lessons and Labs (D.C. Heath, gr. 4-6)
  Fall Guy (HRM, gr. 7-College)
Multitask probe kits:
  Experiments in Science (HRM, gr. 7-12)
  Science Tool Kit: Master Module (Broderbund, gr. 4-9)
  Voyage of the Mimi (Sunburst, gr. 4-8)

Technology in the Curriculum: Science-1987 Update summarizes the advantages of using probeware in the classroom. "Probeware is to science as word processing is to writing: it is a use of the computer that supports the goals of instruction by facilitating the process, making it easier for students to do science." (p. 2)

The MacCounselor
Using the Macintosh in the High School Counselor's Office

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This program will feature uses of the Macintosh in a high school counselor's office. Presentation will include using the Mac for communications and publications, computation of credit and grade point data, organization of T.E.A.M.S. and other standardized tests, and establishing conference records.

Newsletters can be easily produced by a guidance department using the software package Pagemaker. General information such as steps in applying for college, explanation of various tests, and a calendar of upcoming dates could be included as well as specific services available through the counselor's office. Although this information may be found in other guidance literature, a newsletter is an condensed reminder to students and parents.

A course guide can be printed in a newspaper format using Pagemaker and a laser printer. When compared to professional typesetting and printing, production costs are less and the quality is not sacrificed. This format is appealing to students and easily updated from year to year.

Graduation requirements in Texas are now standardized throughout the state. The Microsoft Works spreadsheet can be used to list courses required for graduation, courses completed by a student, and courses in which the student is deficient. This is a valuable tool which provides a counselor with each student's credit status and can be easily and quickly printed for the student.

Grade point averages are computed in a variety of ways from school to school. Although most school's central computer systems compute these averages automatically at the end of a grading period, there is always the necessity to update this information for new students transferring into a school. A spreadsheet program can be used to convert individual grades to a grade point assignment. This can be easily totaled by the program as well. This data can then be entered into the school's central computer

system. The Microsoft Works database program can be used to calculate a complicated grade point average formula for individual students, or a group of students. This information can then be alphabetized by student, or ranked numerically.

Testing is a time consuming activity for all counselors. The Microsoft Works database program can be used to produce a timeline of activities for any test administration. This can be updated each year. The T.E.A.M.S. (Texas Educational Assessment of Minimum Skills) test is given in all high schools in the state of Texas three times each year. The administration of this test involves many memos, letters, and handouts. This information changes only slightly each year, so the use of the Microsoft Works word processor program can be easily updated for each test administration.

Counselors confer with many students throughout the school year and it is important to keep a record of appointments and conferences. The Hypercard software can be used to keep a daily appointment list. A conference record can be set up on the Microsoft Works database to show date, time, and notes on individual students. This record can be kept alphabetized. Confidentiality can be maintained by assigning each counselor in the office a separate disk.

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TEXAS MATHEMATICS STAFF DEVELOPMENT PROGRAM

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In 1986, the Texas Education Agency established the Mathematics Staff Development Program, as approved by the State Board of Education. The program is funded under Public Law 98-377, the Education for Economy Security Act (EESA), Title II. It provides funds for the development and implementation of a series of 24 teacher training modules for mathematics teachers of prekindergarten through Grade 12. The modules are designed to provide a basic foundation for teaching the mathematics essential elements using manipulative materials, concept development techniques, and problem solving applications. Five of the modules deal exclusively with the use of technology across all content strands in the Texas Essential Elements

The rapid advances in and availability of technology in schools have created a gap between the ways that school mathematics is being taught without technology and the ways that mathematics content might be taught through the use of technology. In order to bridge this gap teachers need to investigate the potential uses of the technology both in actually "doing" mathematics and in communicating mathematical ideas. The immediate support for teachers is to provide opportunities for them to make investigations by modeling uses of technology that can be applied directly to teaching. The TEA technology modules do this.

The calculator modules will use a calculator which has the capability to do integer division and operations with fractions in common fraction form. The first goal of the calculator modules' instruction is to demonstrate some of the power of this calculator and to convince teachers that this power is especially appropriate for mathematics instruction. While maintaining the importance of strong conceptual instruction on division and fractions, the modules' activities will raise questions about the current emphasis on teaching students how to deal with symbolic algorithms for division on whole numbers and operations on fractions.

The computer modules will provide instruction on the use of spreadsheets, databases, word processors, and graphics packages which graph data from spreadsheets. The modules are written as generically as possible so that they can be delivered with any set of generic software. It is assumed that teachers can already use the software which is actually available for the delivery of the

module. They also will provide instruction on specific software that is especially appropriate for general mathematics instruction. Again, the emphasis is on tools that extend the mind, not on drill and practice software that provides instruction on specific objectives.

Once a module is completed, the Texas Education Agency identifies at least two individuals from each education service center region who receive training by the contractor for the delivery of each module. These trainers include teacher educators, service center specialists, school district curriculum coordinators, classroom teachers, independent consultants, and publishers' representatives. At the end of the training each trainer receives a trainer's manual (which includes hand-outs for teachers, overhead transparencies, instructions for delivery of the module, and background information) along with a kit of manipulatives sufficient to deliver the workshop to 36 teachers. Each trainer makes a commitment to deliver the module at least twice during the next 12 months; the delivery might be (a) at the request of a specific school district for its own teachers, (b) by a university as a summer workshop for teachers, (c) through a Regional Service Center or county department of education, or (d) as part of a professional conference.

School districts may use local EESA money to provide teacher inservice in the modules. At the conclusion of each workshop for teachers, TEA awards certificates acknowledging that Advanced Academic Training (AAT) credit has been earned; TEA also awards a certificate of participation, with seals affixed for the modules completed. Teachers can apply AAT credit toward career ladder. It is anticipated that by September 1988 over 24,000 teachers will have participated in one or more workshops based on the modules. By September 1989, it is expected that over 50,000 teachers will have participated in workshops on the modules.

This plan allows for information to be shared with many teachers throughout Texas in a systematic way, while at the same time maintaining quality control on the substance of the teacher workshops. However, finding philosophical support from teachers, school administrators, and the general public might present somewhat of an obstacle. It is apparent that considerable concern exists among these groups relative to the use of calculators in the classroom.

Indeed, the primary impact of this project will be through the multiplier effect of taking technology back to mathematics classrooms to improve the learning for the students in those classrooms. That is, the main effect will be felt as teachers go back to their schools and provide models for the use of technology in teaching mathematics. Then students of all of the participating teachers, as well as colleagues of those teachers, will be impacted in the quality of their learning.

Creative Writing - Beyond Word Processing:
A Text and Graphics Approach with *LogoWriter*

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The purposes of this workshop are to explore the writing process and the integration of text and graphics in the creative writing curriculum. This workshop will highlight the four phase approach used to integrate the language arts and computer curriculum.

Logo, a programming language developed by Seymour Papert (1980) at MIT quickly became a standard in elementary schools across the United States and more especially in Texas. Papert developed Logo as a means of teaching children mathematical concepts and problem-solving through a process of self discovery. This powerful language soon became the nucleus of many elementary computing curriculums. However, Logo was limited in scope with major applications being made in mathematic and fine art classes. With the introduction of *LogoWriter* the scope of Logo has been vastly expanded. Logo has now come of age in the language arts classroom as well.

LogoWriter is a program that combines the features of the Logo programming language with a word processor. Thereby making it easy for young authors to write and illustrate. *LogoWriter* provides several options for presentation of work. Stories can be printed in traditional hardcopy format, presented a page at a time for on screen viewing or animated for unique slideshow or movie presentations. *LogoWriter* is a natural in the production of interactive stories as well.

To accomplish the aforementioned ends the process of utilizing *LogoWriter* to teach creative writing includes four phases. Each phase consisting of a specific set of instructions.

PHASE 1 - Teaching the writing process. In this phase the writing process is taught. The writing process consist of five steps. Each step is an integral part of composing communicative written text. These steps are generally a part of any language arts curriculum.

Step 1 - PREWRITING During the prewriting phase the writer is introduced to a topic
and a writing task is assigned. At this point the writer must create a computer
generated outline of his/her ideas.

Step 2 - DRAFTING During the drafting phase the writer puts his thoughts and ideas
into writing. Using the computer in the drafting phase the writer is free to
compose her/his ideas and thoughts without paying special attention to
mechanics, neatness, pennsmanship or apperance. Thus freeing the writer to focus
more closely on the content of his/her thoughts.

Step 3 - REVISION During the revision phase the writer rethinks the content of his/her work, then physically rearranges and reorganizes his/her written thoughts and ideas. At this stage the content of the wordsis made as communicatively clear as possible. Using the computer in the word processing mode makes revisions faster and easier.

Step 4 - EDITING/PROOFREADING During the editing phase the writer fine tunes the written product. Emphasis is placed on the mechanics of writing in this phase.

Step 5 - FINAL COPY At this point the finished product is printed.

The computer is a natural enhancer to the teaching of the writing process. This phase of instruction is generally introduced by the language arts teacher in the regular classroom.

PHASE 2 - Introduction of Logo commands and primitives. In this phase Logo is taught as a seperate entity from the writing process. The "microworld of problem-solving" is explored for the full impact of its value as a mathematical tool. Standard Logo commands and primitives are taught. Once these have been mastered commands unique to *LogoWriter* are introduced.

PHASE 3 - Introduction to *LogoWriter* text processing commands. In this phase *LogoWriter* word processing features are taught. Features include entering text, labeling, inserting/deleting text, formatting and printing of text.

PHASE 4 - Introduction to combining text and graphics. In this phase students are taught the unique capabilities of *LogoWriter* to integrate text and graphics on the same page. Initially, single page hardcopy text production is introduced followed by the sequencing of pages. Once individual page text production is mastered students are introduced to the animation features of *LogoWriter*

In summary, *LogoWriter* enhances the creative process of writing. It provides a means to create text and graphics at sophiscated levels while maintaining an environment for the exploratory style of learning. Any language arts curriculum is enhanced through the utilization of this process.

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PRINT SHOP GRAPHICS & APPLEWORKS
TEHT

-What a Combination!

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This session will demonstrate how to combine the use of *Print Shop* graphics with *Appleworks*. The purposes of this session will be to:
1. discuss how to plan and layout Print Shop designs.
2. demonstrate how to combine the use of the two software packages.
3. display a variety of ideas and situations where the use of the two software packages are appropriate.

Participants will be given handouts for use when planning layout and designs. Public domain graphic disk will also be available.

Print Shop and *Appleworks* are two software tools every computer user should include in their library; especially, if they plan to do inexpensive desktop publishing. Both *Print Shop* and *Appleworks* are simple enough to be used by novice or beginners. However, the combination of these two software packages are sophisticated enough to produce well designed , camera ready copy.

The key to producing quality copy is planning. Hubert, Winebrener, and Qualkenbush provide the foundation for planning quality graphic projects. Well planned layout and design can be accomplished through a series of a 8 simple steps.

Step 1:   Select your graphic(s).
Step 2:   Select your graphic(s) size.
              Choose the appropriate layout sheet for the graphic size you selected.
Step 3:   Select a font.
Step 4:   Place the graphic layout sheet behind the font layout sheet.
Step 5:   Fill in your message.
Step 6:   Complete the sign/greeting card planning sheet.
Step 7:   Make menu selections from Print Shop program.
Step 8:   Preview your design.
Step 9:   Print your design.

Hubert, Winebrener, and Qualkenbush (1987) devleoped a series of planning sheets and templates that make the task of planning *Print Shop* layout easy. These sheets have been modified by the presenter to further expand the concept addressed.

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The incorporation of *Appleworks* in your design adds another three steps to the process.

Step 10:   Create your *Appleworks* text.
Step 11:   Line the printer up where you want the text to be printed.
Step 12:   Print your text.

This process is easy, quick and precise. It saves time, energy and money. But most importantly, it produces quality graphic designs ready to be copied and displayed.

A variety of graphic programs enhance the creativity of the *Print Shop* program. A few are described below.

Print Shop Companion, Graphic Libraries 1, 2, 3 and the *Holiday Edition* are by Brouderbound Software. These packages contain graphics designed especially for *Print Shop*.

Graphic Expander is by Springboard. This package contains Newsroom type graphics for use with *Print Shop*.

Printer's Library Graphic Disks including *Printer's Angel, Printer's Devil, Printer's Patriot* and others are by BCI Software. Each disk in this series provides over 100 graphics and insignias for use with *Print Shop, Newsroom,* and *Print Master*. Printer's Angel contains a Convert-a-Graph program that converts graphics from *Print Shop* to *Newsroom* or *Print Master*.

Texas Graphics by Magic Mind Software Company. This Disk contains over 80 graphics related to the Lone Star State.

Public domain graphic disk are available from a variety of sources. For a collection of some of these graphics bring blank disk to the presentation.

Beagle Brothers *Timeout* Series provides a variety of additional applications for *Appleworks*. *Timeout superfonts* provides desktop type fonts .

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Infusing Technology into the Curriculum

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The Houston Independent School District (HISD) has stated one of its objectives as the incorporation of effective uses of technology throughout the curriculum. This presentation will describe various classroom configurations for using technology. It will also include a discussion of technology's role in the regular lesson cycle as participants learn how standard curriculum objectives can be accomplished with the aid of technology. Subject area software for elementary grades will be used to demonstrate teaching strategies.

Usually technology fits into the curriculum in two ways:

- learning **with** the computer
- learning **about** the computer

The focus of this presentation is the first—learning **with** the computer. The Bureau of Technology is charged with the support of all instructional computing implementation within HISD. This means the Technology Trainers and other staff provide consultation, training, and additional support for all personnel involved in instructional technology implementation.

Teacher Technologists are the main source of information within each school building as to the function and use of computers for all HISD teachers, including those in special programs. One of our purposes as Technology Trainers is to provide Teacher Technologists with enough background and support to be able to help all teachers use computers effectively. We do this by offering update training each year. This year, the update training includes a detailed look at infusing technology into the various curriculum areas. This training for Teacher Technologists will be extended to include classroom teachers.

"Introduction to Technology Infusion" begins with a discussion of current areas and frequency of computer use nationally, at various grade levels, and continues with an analysis of technology implementations which the teachers in that class have observed. Teachers are made aware of the types of

instructional software, and the role of the teacher, computer, and student when the computer is used.

The parts of the lesson cycle emphasized by the current teacher appraisal instrument are discussed, and teachers are made aware of the role computers can play in each part. The infusion process is supported by a nine-step model:

1) Choose the subject or course you will reinforce or extend with the computer.
2) Decide on an integration "level" (course, unit, or lesson) and a development approach.
3) Divide your curriculum into manageable portions and set a schedule for the development of each portion.
4) Identify the goals and objectives for your first portion.
5) Decide on the learning activities for each objective.
6) Decide which learning activities would best be supported by a computer application.
7) Seek or adapt software that will provide the application in the desired subject area.
8) Arrange for access to hardware.
9) Repeat steps 4 – 8 for each portion of your curriculum following your schedule.

The teachers then go over teaching strategies and objectives that can be enhanced or extended with the computer.

The teacher's role will change as curriculum changes to make appropriate uses of technology. Instead of presenting most lessons in the traditional lecture format, teachers can help students master content planned by curriculum and content-area experts, and delivered through student-centered activities, including the use of technology. Teachers will become module developers and plan appropriate instructional experiences making appropriate use of technology.

The primary goal of HISD's instructional computer program is to provide all students with as many opportunities as possible to strengthen their basic skills, and to provide them with challenges requiring the use of critical thinking skills. The Bureau of Technology supports this goal by aiding in the development of a professional staff skilled in the use of technology for instruction and management, thereby increasing the effective infusion of technology in education.

Musical Instrument Digital Interface (MIDI) Applications For The Classroom

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ABSTRACT

Electronic keyboards featuring the Musical Instrument Digital Interface (MIDI) are being used in conjunction with innovative computer software packages to teach music theory courses from a new perspective. This presentation will be an overview of current technology.

Electronic keyboards featuring the Musical Instrument Digital Interface (MIDI) are being used in conjunction with innovative computer software packages to teach music theory courses from a new perspective. One reason for the recent growth in MIDI applications in music classrooms is the increase in the number of students who own such electronic keyboards. In addition, the level of sophistication currently available in computer software makes the instruction of MIDI-based music theory courses more plausible. This presentation will serve as an overview of current technology.

During the first part of this presentation, a brief history of MIDI electronic music will be provided. Then, differences between music synthesizers and digital sampling keyboards will be discussed, and an audiocassette tape showing examples of each type of music will be played.

A MIDI electronic keyboard, linked to an IBM Pc compatible computer, will be demonstrated in order to show unique attributes of the MIDI keyboard as well as the versatility which results from the merging of technologies. A computer sequencer program used to store musical compositions as digital files will be demonstrated, and a description of other computer programs currently available for home pc's will be provided.

A limited amount of "hands-on" time will be provided for participants to interact with the technology, but the primary goal of the presentation will be to describe in summary fashion the ways in which MIDI keyboards are being used with computer software programs to teach music theory.

NEW HORIZONS FOR ADULTS - ADULT BASIC ED LAB

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New Horizons for Adults is a computer-based program that provides fresh, new opportunities for adults to experience success and achieve life-long goals. The components are designed to meet the instructional requirements of all Adult Education Programs and can be used with adults of all ages and ability levels.

The Adult Basic Education Program is designed for adults who wish to raise their reading, writing, and mathematical skills to the levels recommended for entrance in the GED program. Features of the program include:

* Skills introduced in small, logical steps
* High interest adult fiction and non-fiction texts incorporating sequential reading and language arts skills
* Well organized math screens with minimum reading required
* Process writing skills included throughout the content areas
* Life skills including occupational, consumer education, health, safety, government, law, community and personal development instructional modules
* Enrichment programs featuring: decision making, problem solving, following directions, spelling and vocabulary building, time management, self image inventories and stress management inventories

New Horizons for Adults is a program that can assume two forms: one designed for classroom use and the other which can operate as a "take home" commputer program. Used withing a school facility, it becomes a computer learning laboratory, usually managed by an instructor or is staffed by a number of volunteers. In its "take-home" form, New Horizons becomes a home based, self-directed learning program. Computers, courseware and accompanying materials are taken home for predetermined periods of time during which adults work at their own pace to complete the program.

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FUN READER FUN WRITER

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The Fun Reader-Fun Writer Courseware is a supplementary program of extensive and integrated instruction in reading, writing, and language development. Primary instruction is provided in phonics, sight vocabulary, reading and listening comprehension, and writing. The courseware, designed by Educational experts, has been exten ! ~ly field-tested with students to ensure that the product   :s teachers' needs for instructional integration with   .ditional curriculum and for flexible use in classrooms   computer labs.

The courseware teaches over 550 words and includes 38 diskettes, 55 lessons, and over 40 hours of computerized instruction. Instructional units, educational games. a primary word processor, and an on-line management system are also included. The courseware offers a system solution for teacher seeking a multisensory software package to supplement basal reading and writing programs for students functioning at the kindergarten through grade 2 levels. All components are modular for flexible use. Specially designed instructional support materials and enrichment activities develop verbal communication and handwriting skills. The Scope and Sequence along with comprehensive program objectives in phonics, vocabulary, structural analysis, comprehension, writing, and communication facilitate integration with district teaching objectives. Materials organized for use at rour different stations take advantage of computerized and paper-based tracking systems for efficient monitoring and tracking of students' progress. Teacher options are included with each computer program so teachers can customize instruction for specific students and/or classes.

Use of colorful graphics along with carefully designed screens and sequenced instruction make the software motivating for students. Use of digitized human-like speech makes the software accessible to poor and beginning readers in a nonintimidating fashion. All stories used in the reading lessons are designed to be of high interest to young children, so that reading is percieved as an enjoyable activity.

THE PRESCRIPTION LEARNING WRITING LAB

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The PROCESS WRITING LABORATORY was specifically designed to augment the teaching of "process writing" in contemporary K-12 learning laboratories and classrooms. Teaching writing as a process involves students in prewriting activities and in drafting, revising, editing, and publishing their work. Students rapidly acquire an understanding of, and appreciation for, the functional reasons for writing as they develop and improve their ability to communicate.

The Process Writing Laboratory curriculum is organized in unique thematic units, each of which provides approximately six to eight weeks of theme-related writing activities. At the primary level children delight in expressing their thoughts on topics such as feelings, family, the five senses, pets and wild animals. Intermediate students experiment with topics that reinforce writing across the curriculum as well as themes relating to whales, legends, science fiction, fads, fashions and survival.

Students have the opportunity to publish their work throughout each thematic unit, promoting the concept of authorship and reinforcing the functional reasons for writing. Word processing and graphics software, binding equipment, colored printer ribbons, paper and other related supplies are included, making desktop publishing a reality in the classroom and laboratory!

An integral part of the laboratory program is Prescription Learning's continuous support to the school, its teachers and its paraprofessionals. This special on-site service includes:

Provision for initial in-service training for staff, which covers:
* Understanding writing lab process and philosophy
* Learning effective use of all instructional materials
* Full training in the use of the management system
* Diagnosing and conferenceing skills
* Effective holistic scoring of writing samples
* Developing successful laboratory management skills
* Developing computer skills

Weekly visits from an educational consultant to assist the laboratory staff with problem solving, ongoing training and teaching, or other related tasks

Technical maintenance performed by a trained technician to ensure that all equipment is operational

Twice-yearly professional workshops for teachers and school administrators designed to provide a forum for sharing ideas and to raise awareness of new teaching strategies

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THE PRESCRIPTION LEARNING TEAMS LAB

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Prescription Learning has created instructional materials to address the TEAMS objectives for reading writing and mathematics. Prescription Learning's TEAMS laboratory contains everything needed to conduct an extensive instructional and test-taking practice program in reading, writing and mathematics. Combined with Prescription Learning's basic skills reading, math and integrated language arts, Prrescription Learning provides a TEAMS remediation program.

Texas educators recognize the importance of preparing their students well for the TEAMS assessment tests. For that reason, we've created a unique TEAMS Laboratory instructional environment which supports the TEAMS approach in every aspect. In Summary, it:
* provides instruction and test-taking practice in all reading, writing and mathematics TEAMS objectives for levels 1, 3, 5, 7, 9 and 11
* Uses the same instructional method, format and item presentation
* Involves students in both computer and paper/pencil introduction, review and practice of each TEAMS objective
* Provides instruction and practice testing in a corresponding item format and allows students to take sample tests, receive scores, and be prescribed into remedial lessons for missing or underdeveloped skills.
Prescription Learning does more than just deliver and install its laboratories. We work with school personnel in preplanning stages to make sure that all necessary requirements are met. We provide extensive inservice training for all staff who will be using the lab. Our special services continue throughout the year. We stay in touch with administrators and teaching staff to ensure that the laboratory is effectively addressing the needs of the school. In addition to tailoring, shipping, installation and inservice, some of the special serivices include:
* bi-annual teacher's workshops which introduce staff to notable educators, new or specialized techniques or materials, and provide an opportunity for sharing common concerns or strategies

* bi-monthly consulting visits by an educational specialist which support the atmosphere of continued inservice training and problem-solving
* Bi-monthly equipment maintenance visits by a technical specialist who makes sure all hardware and other laboratory components are fully operational.

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APPLEWORKS Applications for the Library

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APPLEWORKS' Data Base, Spreadsheet, and Word Processing
capabilities make it useful for many routine library tasks such
as overdue notices, budgets, bibliographies, and orders. The
presentation will include ways to use each of the program's three
components and demonstrate some of its time-saving features.
Copies of the templates used will be available to participants.

This presentation presupposes that the participants will
already be familiar with APPLEWORKS and its basic operation.
Rather than the technicalities of the program, we will be
discussing specific ways to use it, in hopes that these ideas
will in turn spark new ideas for participants.

The Data Base, which organizes information by categories, or
fields, is probably the most useful of APPLEWORKS' three
components. Anything which is presented in the form of a list is
an ideal candidate for the Data Base. It takes the same amount
of time to plan the layout and type information with a computer
as it does with a typewriter, but with a computer there is added
versatility. A few keystrokes can change column width and
sequence, arrange any one of the fields alphabetically or
numerically. Record selection rules allow printing all or
limited sections of the file. Here are some common library uses
of Data Base:
      Bibliographies - use table format for simple list of author,
           title, call #; use label format to add a line of
           annotation (note: the limit for each field is 76
           characters, so be brief); LAYOUT feature allows fields
           to be placed anywhere on page
      Consideration File - similar to Bibliogaphies; add fields
           for priority and requester; can use TOTAL feature to
           calculate costs; print orders directly from this file
      Inventories - create accession record and/or catalog for
           paperbacks, AV equipment, software, etc.; use to track
           locations, get information for ordering; use FIND
           feature to locate items quickly
      Community Resource File - use pin-feed cards to print
           categories and information directly onto cards; produce
           both individual resource and subject cards

Overdue Notices - print complete list for library in table format, use record selection rules to print specific lists for teachers/grades; labels format will make individual notices for students (or Mail Merge with Word Processor)

When numbers are involved, a Spreadsheet is probably the answer. The ability to create formulas and perform calculations makes it ideal for all sorts of reports. Here are a few:

Budgets - enter information about purchases made and have an instant balance

Annual Holdings Reports - set up Spreadsheet in same format as report form; may be possible to print directly onto form

Circulation Reports - set up summary sheet showing each day and classificaton, with separate column and row for totals

Requisitions - create a template, or blank form, with school address, budget code, etc., already entered; space columns to match those on form; use formulas to calculate shipping charges, total costs; print directly onto form

There are also times when compostion is necessary. A Word Processor can save much time spent with correction fluid! Its ease of editing, combined with a good printer, will leave the typewriter gathering dust. Even composing directly at the keyboard becomes easier with practice. Some possible uses for Word Processor:

Letters - of course; and yes, you can feed letterhead paper directly into the printer using friction feed

Lesson Plans/Curriculum Mapping - create a template with headings spaced to match plan sheets; be sure to change file name before saving to keep blank form

Overdue Notices - use Mail Merge with information from Data Base

Questionnaires - create your own student reading, library use, etc., surveys; compile answers on Spreadsheet

Catalog Cards - use Tabs and Indent option to create hanging paragraphs with pin-feed cards; set margins and page lengths to match card size

Each of the three APPLEWORKS components is useful on its own. The added feature of having several files on the Desktop at once and being able to move information from one to the other through the Clipboard adds to its versatility.

Sharing ideas with other APPLEWORKS users is a good way to learn short-cuts and special features. Organizations such as Apple Library Users Group can also provide ready-made templates. For most of us, the more we apply this program the more ways we find to use it.

COMPUTER GRAPHICS: THE UNLECTURE

by

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The unlecture is a presentation about computer graphics: their past, their present, and their future in high school and college programs, presented all on video tape.

Art and technology! In the beginning there was man, pigment, and a cave wall. Now there is man, computers, and video tape.

Computers are changing the world around us. They change the way we think, teach, see and live. However, computers, too have changed. There have been changes in equipment attitudes and purpose, to name a few.

Computer Graphics: The Unlecture, is a video presentation that documents these changes. It includes examples that highlight significant advancements in technology, as well as, current trends in computer graphic images.

Also featured is a presentation of a premiere start-up program at El Paso's Ysleta Independent School District, and at the University of Texas at El Paso.

You all come, sit back and enjoy Computer Graphics, The Unlecture.

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COMAL'S CAMP FOR COMPUTER-AGE KIDS

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New Braunfels, Texas 78130

Computer Camp was great! We will share our ideas in planning, scheduling, and implementing a fantastic summer computer camp experience. Our sharing session will include a video compiled of the four camp sites.

Computer camp was formulated as a result of a need of our student to learn more about computers than time permitted in a classroom setting. Because of the size of our district (600 square miles), the camp sites were located on three elementary school campuses, 12 to 20 miles apart.

Our camp theme was "A Day in the Life of Computer-Age Kids." We used this theme to influence the software chosen, the activities used, and the structure of the day. The theme also gave the students a chance to explore the past, experience the present and predict the future uses of computers.

The goals we chose were:
- to develop or improve keyboarding skills,
- to develop or improve word processing capabilities,
- to generate graphic templates using graphic utilities,
- to develop a camp newsletter using the word processing application and graphic utilities,
- to solve turtle graphic programs through the use of LOGO programming language and
- to develop problem solving skills using MECC software.

Comal Elementary was fortunate to be chosen as a pilot site for the implementation of Professor AWHFE, a keyboarding process developed by Tom Boudrot, TEA. In the computer camp all students had the opportunity to learn keyboarding using the Professor AWHFE materials. One novice fifth grader was typing 40 wpm by the end of the two week camp.

Word processing was used to reinforce the skills learned in keyboarding. Because of the various activities and choice of font sizes, Magic Slate by Sunburst was the software used. Articles were created, edited, and published in a camp newspaper on each site.

Students created turtle graphics through the use of E-Z LOGO from MECC. They worked with programed activities then developed original designs. Selected designs were saved, printed and placed in the newspaper.

The campers cultivated critical-higher level thinking skills through the use of problem solving software from MECC (i.e., Odell Lake, The Market Place and Oregon Trail).

Nina Bowser, CISD Computer Coordinator, visited each camp site with a 'goody box' of computer parts and related items from an abacus to a one megabyte silicon chip. The campers were able to examine each item as it was circulated.

The production of a newspaper, at each of the four camps, incorporated keyboarding, word processing, turtle graphics and research. Through the generosity of Apple Computer, Inc., and Computer Solutions of San Antonio, all campers received a copy of each site's newspaper.

The last day of camp featured an hour of SHOW TIME where the campers amazed their parents and guests with the knowledge acquired during ten four-hour fun-filled days. Numerous awards and certificates were presented for individual achievements in all areas. Hence, "A Day in the Life of Computer-Age Kids."

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Desktop Publishing For Educators

John Cutsinger

Eanes Independent School District & Westlake High School
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PUTTING MORE MASTERY INTO THE

MASTER TEACHER
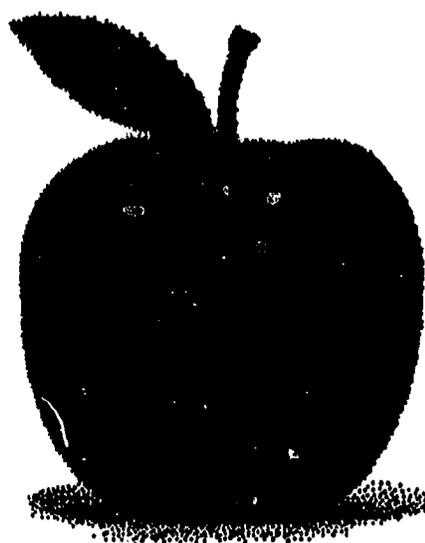
Placing a premium on the importance of presenting materials in a visually stimulating way in an effort to compete with television and eye-catching graphic publications, more and more educators have turned to desktop publishing as a means by which to grab students and guide them into the assignment.

Through the graphic enhancement of routine classroom materials, education has added a new dimension to the term *master teacher*. Complete lessons can be coordinated into attractive units of study with a strong visual unification with the use of desktop publishing.

No longer do students have to squint to read poorly typed and reproduced materials. No longer do teachers have to completely structure materials from scratch. With DTP, both sides of the teacher's desk prosper. Materials can be edited and revised with little effort and students can gain new insights without losing their sight.

Desktop publishing can help to put the polish on the teacher's Apple--and lesson.

Never has the classoom teacher had the opportunity to welcome students to a learning experience with materials that actually invite them to become actively, enthusiastically involved. Even the most fficult and complex lessons can be made more easily derstandable through masterfully conceived, written and signed handouts, worksheets, examinations and overard presentations.

Using the desktop pubhing system challenges e teacher to create not ly visually stimulating cuments, but also encoures creativity and innovan in jazzing up traditional son plans.

🍎 To have the maximum nceptual appeal and sign potential, curriculum-related presentations should have a catch-phrase, much like those used by advertisers to "hook" their potential buyers. The catch phrase can be set in a larger point size or in an attention-getting typeface to it greater impact.

🍎 Set the instructions for worksheets or the thrust of informative handouts in larger and possibly bolder type to signal its importance to readers.

🍎 Within longer reading selections, set key words and phrases in boldface or italic type to give them a premium place of importance.

🍎 Incorporate artwork and graphics to create a stronger visual appeal.

Don't be satisfied with giving your students less than they deserve. Consider a desktop publishing image for you and the courses you teach. You deserve the best too.

THIRD TIME'S **SELF-EDITING PROCESS**

In the initial reading of your story, concentrate on how effectively and completely you have told the story with regards to details and reactions.

♣ **LEAD**
Does the lead effectively capture the attention of readers with an interesting angle and set the direction of the story with specific details of the activity, event or issue?

♣ **DIRECT QUOTES**

♣ **TRANSITIONS**
Do transitions promote a smooth flow between direct quotes and provide readers with substantial, little known information which adds dimension to the story?

♣ **CONCLUSION**

The second reading should-focus on the stylistic approach to the story; strive to maintain a consistency which will promote cohesion.

♣ **SPELLING**
Have all words been checked for accuracy in spelling to assure ease in reading, clear understanding and readability?

♣ **PUNCTUATION**
Have standard journalistic punctuation rules been followed consistently to promote readability?

♣ **PARAGRAPHING**
Have brief, concise paragraphs been used to encourage readership? Have new paragraphs been used to introduce each direct quote and transition?

♣ **ATTRIBUTION**
Have all direct quotations been attributed according to the style adapted by the staff for its publication on both first and subsequent references?

Prior to publication, read the story and consider ways in which to add final refinements to give content that extra sparkle and verbal appeal.

♣ **GRAMMAR**
With all basics well under control, has a variety of grammatical techniques been used to prevent boredom? Has parallelism been integrated in structure? Are all elements in agreement?

♣ **WORD CHOICE**
Does each word contribute to creating an impactful image including specific, visual nouns and strong, action verbs?

♣ **ACCURACY**
Has all information been checked and double checked to make sure it is correct?

♣ **PRESENTED BY**
John Cutsinger, Adviser
Westlake High School
4100 Westlake High Drive
Austin, TX 78746

WHERE YOU LEAD **THEY WILL FOLLOW**

FOR EXAMPLE

Regardless of subject matter, handouts, worksheets and even tests can take on student appeal with a strong concept and effective visual presentation. The handout to the left and the worksheet at the top provide students with visually competitive materials and teachers with easy-to-present, easy-to-evaluate lessons.

Taking
Desktop
Publishing
to the State
of the Art

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DESKTOP PUBLISHING
DESIGN & LAYOUT

State of the Art

Just because you own a hammer doesn't make you a carpenter. And just because you have a crescent wrench certainly doesn't qualify you for a plumber's license. Nor does the ownership of a desktop publishing system give you credentials as a designer.

When technology introduced desktop publishing as an alternative to the traditional approach to planning and producing publications, it created the ability for the educational and business markets to produce documents in-house at a reduced, affordable cost. Simultaneously, the technology also heightened the potential of publications with regards to both quantity and quality.

However, often overwhelmed by the economizing which results from the use of desktop publishing, education and business continue to awaken rudely to the lack of visual impact of their publications as a result of a mutual lack of design experience and expertise from those who use the system.

Genuine mastery of software packages comes only with the mastery of basic design and layout concepts. To best guarantee that readers will read and fully experience the content of the presentation, design plays an all-important role. Once functional design has been planned, then layout through desktop publishing creates the reality of the content.

In other words, design comes from the careful placement of substantial elements by the artist; then, and only then, the artist accomplishes those designs physically with desktop publishing

State of the Art

hardware and software.

Body copy and headlines as well as photos, illustrations and captions must be strategically placed to ensure ease and understanding of material and the relationship of all elements.

In a single-page flyer, in a tri-fold brochure or in a multi-page document, the designer must conceive, establish and maintain a design strategy which puts everything in its place with content control, consistency and personality.

All elements must work together to tell the intended story. Copy and headlines must be carefully written and edited, photos and/or illustrations demand purposeful execution and graphic techniques showcase content in a deserving, meaningful way.

Basic rules can be broken, but only with strong purpose and direction as the designer must first know the rules and be able to control them.

Consider these functional guidelines in the design of even the simplest of projects:

• Does the presentation have a deserving center of visual impact? Does the element which serves as the focal point drawing readers into content command attention and demand continued readership?

• Have outside margins been established and maintained to give the design a planned look? Does the consistency afforded by the top, bottom and side margins create a unity on one given page as well as on subsequent pages of a multi-page document?

› Has a consistent inner spacing been maintained be-

tween all elements to promote a unified appearance? Does the space between elements serve to show where one element ends and another begins?

• Does the size, style, density and graphic treatment of type reflect the importance of content? At a glance, does the reader know what to read first, next...?

• Does the headline lead the reader into the body copy and does each photograph/illustration have a substantial, insightful caption? Do both pairs of elements work together as a verbal/visual unit?

• Have graphics been used as indicators to the reader of the importance of content—either unifying or separating deserving elements?

With all the basics well under control, the designer can create graphic strategies to present content with innovation and appeal-achieved with an in-house desktop publishing system.

Critical Thinking Through Simulation

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ABSTRACT

Simulation and gaming techniques have been advanced as
powerful tools for the development of critical thinking
skills. In the recent avalanche of software several
excellent simulations have become available. This session
will review exemplary segments of selected simulations and
their relationship to the development of critical thinking
skills.

Critical thinking has recently been revived as an
educational priority. Many of the recent reports on
education have recommended attention to these skills and
many states have mandated their inclusion in the curriculum.
Certainly not new, the notion of problem solving and higher
order thinking skills have been with us even before John
Dewey and Benjamin Bloom.

In the recent literature critical thinking, problem solving,
and higher order thinking skills are used almost
synonymously. Advocates argue that these skills can be
taught but differ in their approach. Several programs have
been developed which clearly focus on the development of
intellectual processes (Sternberg, 1984).

Direct instruction may be the most effective way to
introduce higher order skills, but thinking critically
probably cannot be taught directly (Cornbleth, 1985). To
think in a critical manner requires a degree of skepticism
and the essential element of problem recognition (Sternberg,
1985). The instructional medium of simulation provides an
arena of opportunity for many aspects of critical thinking.

Simulation is a functioning model of a device or situation.
Some simulations simply involve only technical situations
and thus decisions are made strictly on the basis of
technical reasoning. Many simulations involve social
interaction and operate with goals and rules, rewards and
punishment. These more complex simulations provide
appropriate practice to sharpen critical thinking.
Simulation games became popular as an instructional medium
some twenty years ago.

The introduction of the microcomputer created an environment for instructional simulation to make a quantum leap. Programming can be accomplished to recreate reality in terms of events and consequences. Simulation games for microcomputers may be utilized in virtually any setting from an entire class to individualized development and practice of intellectual skills (Kendall and Budin, 1987). Widely separated classes and students may be linked and participate in simulations via telecommunications (White, 1987).

A potential problem with microcomputer simulations is that they may be viewed as simply games (Rooze and Northup, 1986). Debriefing or discussion after the simulation is essential in noncomputerized simulations. Likewise, various aspects of critical decision making experienced during the computerized simulation need to be discussed and alternative courses of action examined.

Some critical thinking and problem solving skills readily addressed in microcomputer simulations are:

- problem identification and strategy development
- selection and organization of information
- comparing and contrasting information
- developing and testing hypotheses
- consideration of alternative courses of action, and examination of consequences

Microcomputer simulations provide excellent opportunities to sharpen critical thinking or problem solving skills. These skills, however, must not be left to chance but extensively debriefed after the game is played.

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Turning On Social Studies Teachers to Microcomputing In the Classroom

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Microcomputers are infrequently utilized in social studies classrooms.
Current and prospective social studies teachers need direct experience
with microcomputers to develop positive attitudes toward computer
assisted instruction in social studies. A user friendly simulation or
gaming program is excellent for initiation. The merits and shortcomings
of drill and practice are best demonstrated by software which challenges
the participants' knowledge. Participants need to be allowed to explore
a variety of simulations and games relevant to their teaching
assignment. Experience with a data base should also be provided to
demonstrate the potential instructional uses of data manipulation.

According to recent surveys microcomputers are infrequently utilized in
social studies classrooms. The perception of many social studies
teachers is that microcomputers are inappropriate for instruction in
social studies, largely due to the interpretative nature of the content.
The lion's share of the social studies curriculum focuses on history -
generally viewed as a humanity - and most social studies teachers value
understanding of the past and not just a recording of events. Many
social studies teachers view the computer as merely a post industrial
electronic gadget for storing and retrieving information.

Most of the early software for secondary and elementary social studies
reinforced this view. Largely drill and practice in nature, these
programs offered little for analysis. However within the past few years
considerable development of sophisticated software has taken place.
Many simulations and other programs providing data manipulation and
requiring decision making have appeared in the marketplace. Clearly the
absence of software is no longer a legitimate excuse for excluding
microcomputing from the social studies instructional scene.

But how are reluctant teachers persuaded of the potential uses of
microcomputers in social studies classrooms? Without question the best
salesman is a positive, successful experience with a microcomputer. To
merely demonstrate how a computer can be used is not effective.
Potential converts must actually use the microcomputer. A lab setting
is ideal in which two teachers are assigned to each computer. In
workshops and inservice sessions the following sequences and software
seemed rather successful and fostered positive attitudes by social
studies teachers toward computer assisted instruction:

1. To provide an initial experience with a gaming situation
Crosscountry USA (Didatech Software Ltd., 1985) is an excellent

ice-breaker. This geographic simulation places the players in roles of truckers picking up and delivering commodities to various locations in the country. The four option game is sufficient to attune players to this simulation. Recently released Crosscountry Texas (Didatech Software Ltd.,1988) provides even more attraction to Texas teachers due to the proximity and familiarity with the content.

2. Continuing with the geographic focus States and Traits (DesignWare, 1984) is essentially a drill and practice situation in which states are moved to their proper locations, capitals identified, and other historical trivia. This program provides teachers with an example of drill and practice involving graphics. A more challenging option is U.S. Geography Adventure (Queue, 1984) as players identify state capitals, major cities, rivers, and other geographical features.

3. Social studies teachers generally pride themselves with their vast knowledge of historical trivia and tidbits. U. S. History: Growth of a Nation (Focus Media, 1984) is a three-part drill, practice, and tutorial exercise of United States history and for most teachers success is guaranteed.

4. Time Tunnel: European History and Time Tunnel: American History (Focus Media, 1984) present a considerable challenge to most teachers. These programs require more than simple identification in that clues may be obtained at a cost which encourages deductive thinking. After the Time Tunnel series most teachers have bruised their egos to the point that a return to gaming is in order.

5. By this time most teachers are feeling rather confident with computer operation. Software Options such as Lincoln's Decisions (Educational Activities, Inc., 1983), President Elect (Strategic Simulations, 1981), and Oregon Trail (MECC, 1985) provide opportunities for increased experience with educational gaming.

6. The final activity involves introducing teachers to the microcomputer as a tool for manipulating primary data. A data base may be developed from demographic information provided by participants in the workshop or class. This data may then be manipulated to draw conclusions or generalizations about the participants. An option to current descriptive data is to develop a data base from a historical source such as a cemetery and use this data for analytical purposes. Still another option is to use a prepared data base such as the Social Studies Data Base Files from Newsweek NewsWorks or Fact Works and to utilize this data in developing conclusions.

For social studies teachers to become active users of microcomputers for instructional purposes they must have had successful experiences with microcomputers. This experience must be with user friendly software relevant to the teaching assignment of the participants.

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COMPUTERS TO GO

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The Take Home Computer Program is an idea that has become a reality. It is based on the belief that parents and students can learn together at home, and that the home can be an extension of the classroom. The Take Home Computer Program, piloted on two elementary campuses in Bryan Independent School District last year, has expanded this year to serve approximately 480 students. The program promotes greater time on task by providing instructional activities which can be used effectively in the home. The student/parent program engages youngsters in grades 1-4 and their parents in computer and workbook activities designed to improve reading, writing, math, and study skills.

Bryan Independent School District contracts with Prescription Learning Corporation to provide a Take Home Computer program for eligible Chapter 1 students on ten campuses in the district. Prescription Learning believes, as does Bryan ISD, that time on task increases student achievement, not only in the classroom, but at home as well. In this program everyone is encouraged to become involved in the educational development of the student. A computer actually goes home with the parent and student; thus, the Take Home Computer Program helps to enhance education with today's technology. Nine years ago, through its work with The Institute for Parent Involvement, Prescription Learning offered a parent program which consisted basically of a series of carefully monitored student workbook home activities. The growth that schools experienced as a result of taking part in that progam encouraged Prescription Learning to look into ways to enhance its product even further.

Four years ago, the "portable computer" aspect of that concept was developed. The Take Home Computer Program allows students and parents to work at home with a computer and software that is "borrowed" from the school for a period of time. Students are prescribed into reading and math activities which reinforce skills they need most to learn. Accompanying workbook activities provide students with written practice on specific skills.

Two years ago, the possible benefits of such a program for Bryan students were investigated. Funding was available through Chapter 1 funds to pilot the program on two campuses last year. After evaluating all areas of the program on the various campuses, the decision was reached to serve students on two campuses with close proximity so that a one-site installation was possible. Approximately 120 students from 114 homes were served; and it was determined by end-of-year studies that 85-90% had made significant gains in both reading and math. While all of the success cannot be attributed to this one effort, it can be said that, without a doubt, the Take Home Computer Program played a significant role in these gains.

The addition of this program provided an opportunity for students to succeed in mastering the required basics while enabling parents to become vitally involved with the school in providing for their children's education.

The Take Home Computer Program offers many features which provide direct benefits to students:

**Through individually designed computer activities, students get appropriate lessons to hold their interest and to support classroom instruction.

**Lessons are designed for use at home; therefore, they are easy to use and motivating for students and their parents.

**Parents see "education in action" through their involvement in the educational process.

Workshops are held for parents to teach them how to assemble the computer parts and how to use the material provided; so that before a computer goes home with a family, that family has been trained in its use. The major thrust of the program is to increase parental involvement. It provides an opportunity to make the home a pleasant and productive classroom. With the right challenges and the right cooperation from parents, learning can continue successfully at home.

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Advanced Applications of Logo

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Abstract

Logo is often considered a toy language suitable for preparing children for the intricacies of more powerful programming in Basic and Pascal. In fact, Logo is a considerably more sophisticated programming language than any other taught at the pre-college level. Applications which move beyond Turtle graphics to use Logo's strengths of unstructured symbolic manipulation are now becoming available.

Recent resources for teachers interested in tapping the full power of Logo include:

Books

Logo: Principles, Programming, and Projects. (disk with programs included) George and Joan Lukas. Wadsworth, 1986. 411 pp.

a good first book if you are interested in advanced Logo attributes such as list structures, recursion, and procedural modification; but want a fairly basic introduction before tackling more sophisticated resources

Logoworks: Challenging Programs in Logo. Cynthia Solomon, Margaret Minsky, and Brian Harvey. McGraw-Hill, 1986. 388 pp.

written for Atari Logo (but easily translated into other dialects), these programs illustrate enjoyable classroom applications, good style and a wide range of useful algorithms

Advanced Logo: A Language for Learning. (disk with programs available) Michael Friendly. Lawrence Erlbaum Associates, 1988. 661 pp.

includes exercises that teach fundamental artificial intelligence concepts through using Logo: problem solving

strategies for games; tree-search; knowledge programming;
exploring language, physics, math; knowledge representation

Computer Science Logo Style, Volume 1: Intermediate
Programming, Volume 2: Projects, Styles, and Techniques.
Volume 3: Advanced Topics. (disk with programs available)
Brian Harvey. MIT Press, 1985, 1986, 1987. 319, 315, 393
pp.

a very thorough overview of programming methods, illustrative
projects, and computer science concepts communicated by
Logo

Visual Modeling with Logo: A Structural Approach to Seeing.
James Clayson. MIT Press, 1988. 393 pp.

explorations of various designs, grids, and spaces, with
explanations of underlying geometry

Turtle Geometry: The Computer as a Medium for Exploring
Mathematics. Harold Abelson and Andrea diSessa. MIT Press,
1982. 477 pp.

the classic work which first revealed the power of Logo
microworlds for geometry

Exploring Language with Logo. (disk with programs available)
E. Paul Goldenberg and Wallace Feurzig. MIT Press, 1987.
339 pp.

grammars, linguistic blueprints, structures, conversations:
fundamental constructs of language explored through Logo's
list processing capabilities

Periodicals

Logo Exchange (Journal of the ICCE Special Interest Group
for Logo-Using Educators). published monthly September
through May by ICCE, University of Oregon, 1787 Agate
Street, Eugene, OR 97403-9905.

The Next Generation: Intelligent Tools for Learning

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Abstract

Researchers in artificial intelligence and cognitive science are developing six different types of advanced knowledge transfer tools. This work is part of a larger evolution in computer science from databases to knowledge bases and symbolic manipulation. This presentation will describe illustrative applications of this research and their implications for university instruction.

A new paradigm for how to use information technologies is emerging. Originally, computers were seen as number crunching machines; with time, their data processing capabilities were recognized. Now, the strengths of integrated computer and telecommunications devices for all forms of individual and group symbolic manipulation are being explored. The conceptualization of information technologies as symbolic manipulation devices is leading to research on how data and information can be converted to knowledge and wisdom [Dede, Sullivan, & Scace, 1988].

Six advances which, if attained, would potentiate a new philosophy of teaching and learning in university instruction are:

* self-directed exploration
* easy access to knowledge integrated throughout the curriculum
* learning-while-doing
* individualized instruction
* peer tutoring and group learning
* instruction unhampered by barriers of space and time

Recent developments in educational technology are making this vision achievable and affordable.

Researchers in artificial intelligence and cognitive science are developing six different types of knowledge transfer tools which map onto this long-standing vision:

* microworlds, which allow manipulation of the rules governing artificial realities
* hypermedia, which provides a method for interconnecting data into networks of knowledge

- **empowering environments,** which facilitate task performance through the tool assuming responsibility for standard symbolic manipulations
- **intelligent tutoring systems,** which individualize complex material by understanding whom, how, and what they are teaching
- **computer-supported cooperative learning,** which provides machine-based support for peer tutoring and group interaction
- **tools for learning at a distance,** including two-way television, information utilities, and interactive videodisc

While many of these tools are now in the proof-of-concept stage, advances in computational power at declining cost will allow their widespread implementation in the next decade [Dede, 1988].

The two most common errors in technology assessment are overestimating the speed of diffusion of an innovation and underestimating its eventual consequences and side-effects. These emerging tools may be widely used more slowly than expected, since the primary limits on adoption of a new technology are social, economic, and political; but the impact of knowledge bases on the traditional instructional paradigm will be profound. University education will doubly affected: First, the methods and skills used by professors will change as emerging technologies allow more effective delivery of instructional services. Second, as job roles alter due to information technology, the goals, content, and clients of higher education will shift in response.

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Improving Teacher Appraisal

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This presentation examines issues in the reliability of scores in the *Texas Teacher Appraisal System*. Composite, anonymous scores adapted from a number of school districts will be used to show discrepancies between the standards established for appraising and what many school districts are finding when they analyze their scores. Methods for looking at inter-rater reliability and inter-criterion variations will be examined, as well as suggested techniques for improving the consistency and quality of the appraisal process itself.

Despite the consistency of appraiser training, most districts look at their end-of-year appraisal statistics to discover that inter-rater reliability is far from the standard we anticipated. In fact, districts often find a 80% to 90% variation which cannot easily be explained by the differences in the teachers, settings, or lessons which were observed. There are a number of analyses which can show inter-rater reliability as well as the degree of rating discrimination.

By interviewing appraisers, we find that some appraisers use Exceptional Quality as their only discriminating factor. They routinely award Exceptional Quality when teaching meets the standard and "deny" Exceptional Quality when it falls short. These appraisers often view Standard Expectation as "the teacher performed the indicator in any minimal way" with no regard for effect on students. Other appraisers look for effect on students in awarding even Standard Expectation, and award Exceptional Quality only for teaching which goes beyond the norm to serve as a model. Often these two interpretations exist at neighboring schools.

This variation in interpretation leaves the district in an untenable position. Virtually any grievance hearing or lawsuit would be seriously prejudiced by a report that inter-rater reliability was only 10% or 20%

across the district. Teacher morale would be as severely affected. In this situation, achieving levels of the Career Ladder can be viewed as a function of where one teaches rather than how one teachers. More importantly, it undermines the information the district depends on both for rewarding model teaching and for providing staff development to strengthen areas which need growth.

Moving beyond inter-rater reliability, districts can begin a program of inter-rater communication to address these problems. Without modifying the guidelines from *TTAS* training, groups of appraisers can begin to apply the standards to their specific situations. They can examine issues which cause discrepancies, and they can come to agreement on standards for the district.

Appraisers have reacted by being at first wary, then relieved, and finally eager to have assistance in some of the difficult decisions which must be made during appraisals. The appraisers benefit by feeling more supported in their scoring. The district benefits by having more consistency and stronger appraising. And, the teachers benefit by having a process that is more equitable and one which provides a surer base for improving classroom performance.

TEAMS—Writing with Power

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This presentation and computer demonstration examines ways that the writing process can be improved by using word processing and related print materials. Sample lesson plans will show how students can build the writing skills currently addressed by *TEAMS* in a combination of hands-on and off-computer activities. Techniques for introducing word processing will address the new state elementary computer literacy requirement.

Of the three areas currently addressed by *TEAMS*, writing skills are identified by many districts as their major concern. Scores in writing are lower, and they seem to be harder to raise than scores in reading or mathematics. At the same time, schools are under increasing pressure to incorporate computers into elementary curriculum. As many schools work to get beyond drill and practice computer assisted instruction, it seems that word processing can be an effective way to achieve these goals simultaneously.

Word processing provides a unique opportunity in teaching writing. It permits the separation of two disparate skills. Writing is a primarily cognitive skill, determined by vocabulary, word order, fluency, structure, and mechanics. Handwriting is primarily a motor skill, determined by the development and training of large and small muscles. A major part of our student population is handicapped when the cognitive skill of writing is measured in couple with the motor skill of handwriting. Word processing allows for the development of writing skills, without the necessity of the development of handwriting. While keyboarding may be of benefit to speed of writing on the computer, we have seen many times that it is not required to the same degree that motor skills are required for handwriting.

Using the computer for word processing presents a series of challenges. First, the materials used must be specifically correlated to the

curriculum. There are available any number of word processing activities for teachers to use. However, few of them address areas as specific as those in the writing skills on the *TEAMS* test. Effective use of computers may incorporate, but must also go beyond using the computer simply for creative writing.

Second, the materials must provide correlated off-computer activities as well as hands-on computer activities. While the ideal may be one computer per student in a lab setting, most schools find that they are fortunate to have enough computers for half of a class, and more often they have one-to-three computers for a whole classroom of students. In these situations, quality materials must preview and extend the computer writing activity.

Third, the materials must address the sequence of teaching word processing skills to students. Teachers are often reluctant or unable to dedicate classroom time to teaching the word processor as a separate skill. The exercises themselves must be structured in such a way as to present the word processing skills in the same developmental sequence we would expect for the presentation of the writing skills.

And, fourth, the materials must provide the teacher with the same quality of support materials which would accompany a good textbook series. While we have those commendable teachers who will create their own lesson plans, transparencies, pre-tests, post-tests, student materials, and data disks, effective writing materials must recognize that other teachers simply do not have the time, the skills, or the inclination to do so.

Using the computer to build writing skills must not be left to the chance that we have a certain type of teacher in the classroom, any more than it can assume that these teachers have the time and training to develop an appropriate scope and sequence for the teaching activities. Word processing as a tool for teaching writing must be an opportunity open to all of our students.

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Managing Your Budgets and Activity Funds

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This presentation demonstrates two packages of computer software which address specific ways building administrators and administrative assistants can save time and effort in keeping campus records of budgets and activity funds. Even though the administration may have software to track these funds at the district level, these programs save valuable time in keeping the records most schools maintain in the local building.

The situation is similar in many school offices. In the lower, left-hand drawer the secretary keeps a big, ring-binder notebook. In the front section there is a log of each purchase order that has been written. Then there is a section for each budget account with a beginning entry for the budgeted amount. As a purchase order is written, it is logged into the front page and added to the corresponding budget. Special columns or notations keep track of which of the monies are encumbered, and which have actually been paid.

Periodically, the secretary goes through all of the accounts to check them to make sure they balance. And, once a month, the district bookkeeping office sends over a print-out which also has to balance with the notebook.

Sound familiar? The *Budget Assistant* program makes short work of this notebook. Even if a district does all of the budget accounting on computer, the individual campus still usually keeps records so they can check the business office records. The demonstrated program tracks budget accounts, budget amendments, purchase orders, and payments.

Budget Assistant also prints reports that show the balances in each account for any time period or for the year-to-date. A detail of each account shows every transaction that goes into the balance. Tracking open

purchase orders or purchase orders over and under the estimated price is a snap. And, the package even allows reports that track all purchases for a particular fund or function, or all purchases for a specific vendor.

Perhaps even more frustrating than bugdets is accounting for activity funds. With activity funds a school typically has to track deposits as well as withdrawals, and sometimes they need to account for specific budget items within an activity fund, such as uniforms for a team or travel for a choir.

The *Activity Fund Accountant* helps by allowing the entry of an unlimited number of activity fund accounts and sub accounts. Each account is then treated separately, so it doesn't matter if you have just one checkbook for all of the accounts, or separate checkbooks for each one. Opening balances, budget amounts, deposits, and withdrawals are all automatically reflected in the account balance, which is displayed any time a transaction is entered.

Reports allow simple reporting on account balances, or details of each transaction, and even budgets within an activity organization. And, they are so easy to run, you won't believe you ever did them any other way.

These two packages are demonstrated as a way to improve financial accountability, save administrative time, and protect school officials from questions about appropriations of funds. They make one of the most tedious routines in the school office into one of the easiest; one of the most criticial, into one of the most reliable.

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USING LOGOWRITER FOR KEYBOARDING AEROBICS

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The necessity of teaching KEYBOARDING at the elementary level has been well established. Finding affordable keyboarding software was a problem for our computer lab until this presenter devised an interactive program using LogoWriter to teach students key-positions and correct fingering. This program will be presented along with instructions for obtaining the program. Users will be shown how to modify the program to fit their needs.

LogoWriter has been the core of the computer program at Rosemont for the past two years. Because of its site license agreement, LogoWriter has met the need for sufficient copies of LOGO and a word processor for our entire lab. This provided the means of presenting two of the elements of the elementary computer literacy requirements. In addition, we have the capability of writing dynamic stories with animation.

After previewing many keyboarding programs and finding a few to be effective, the cost of sufficient copies for our lab made them prohibitive. Initially teacher-made keyboarding books were used by students to practice desired keys. Though this method worked for routine drill, it was not effective in teaching the location of keys and correct fingering. LogoWriter provided an easy way to write an interactive program for teaching the keyboard.

By changing the 30 turtle shapes to the letters of the alphabet and a few special character keys, the presenter wrote an effective program that places the letter on the keyboard in the appropriate color for each finger. As soon as the correct key has been typed, a new letter appears. Letters are presented in short sequences to introduce keys in the order they are needed to produce a student project. After completing the first few lessons, students have been introduced to the keys needed for simple LOGO procedures. Then as other letters are introduced, students are ready for word processing and more sophisticated programming.

No keyboarding software alone will teach a student to type correctly. Much teacher instruction, demonstration, and supervision are needed in order to guarantee mastery of these essential skills. Keyboarding Aerobics has been effective in providing one phase of the keyboarding curriculum.

Lessons include:
I.   Home Keys
     A. Finding Home Keys
     B. Return Key Stretch
     C. Practicing Home Keys
     D. Home Keys with Space Bar

II.   R, T, G, B

III. Numbers

IV.   LOGO Keys

V.   E, C

VI. Shift Keys

VII. U, I, O, P

VIII. H, Y, M, N

IX. Q, W, Z, X, V

X. Test Sentences

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Getting Ready for the Turtle: Pre-Logo Computer Languages and the Development of Young Children

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Abstract: This presentation will compare and contrast through demonstration two pre-Logo computer languages, E Z Logo and Delta Drawing, in terms of their applicability in fostering "Logo readiness" and selected developmental skills in young children, pre-school through grade three. Additionally, participants will learn how to create their own pre-Logo language using any full scale version of Logo.

Seymour Papert in his groundbreaking book on educational computing, Mindstorms: Children, Computers, and Powerful Ideas (1980), makes it clear that from its conception Logo was to be a high level computer language with "no floor and no ceiling." He beleved that even very young children can naturalistically and informally "learn to use computers in a masterful way, and that learning to use computers can change the way they learn everything else" (p.8). Over the past decade, thousands of elementary age children have proved him right as they used Logo and "turtle geometry" to learn powerful ideas from traditional subject matter areas such as mathematics, computer science, science, etc. Even more importantly from Papert's point of view, they develop seminal intellectual structures which, though not subject-specific, profoundly affect all subsequent learning.

Those of us who have worked with children and Logo over the years know that elementary students, using the Logo turtle as "an-object-to-think-with," can write remarkably sophisticated programs that deal with concepts once thought too abstract for young minds. The Logo turtle becomes, as Papert hypothesized, a transitional object that enables children to make connections between the concrete and the abstract and to build intellectual structures of the sort seldom addressed in the schools' formal curriculum. The only question many of us had about using Logo with young children was "what is the earliest appropriate age at which Logo should be introduced?"

Programming at its most basic is nothing more than the giving of instructions, and preschool age children are quite capable of giving instructions. From a computer programming perspective, the problem with asking preschoolers to program is that they are, for the most part, only capable of giving spoken instructions rather than written ones. Even a language like Logo with its relatively simple commands such as FD 25 (forward 25 turtle steps) and RT 135 (pivot right 135 degrees) requires writing skills and conceptual skills that are somewhat beyond those of the average preschooler. Most children, therefore, are not ready to work effectively with a full scale version of Logo until kindergarten or first grade and some even later For those educators wishing to give very young children (starting as early as age 3) the developmental benefits of working in a Logo-like environment a number of modified versions of the full scale implementation of the language have been developed.

Two popular Logo-like languages suitable for use with preschool through elementary age children are EZ Logo (Minnesotoa Educational Computer Consortium) and Delta Drawing (Spinnaker Software). For use with very young children these pre-Logo languages have a number of advantages:

1. They avoid the difficulties of two letter commands, rigid syntax, numerical inputs in degrees and turtle steps, variables, and complex workspace management routines of the full scale versions.

2. They primarily use single keystroke commands to manipulate the turtle (eg., to move the turtle forward 10 turtle steps, EZ Logo uses "F" and Delta Drawing uses "D"; to turn the turtle right 30 degrees, both EZ Logo and Delta Drawing use "R").

3. They are similar enough to the full scale versions to develop a sense of "Logo readiness."

4. When children do switch over to a full scale version many important skills and concepts will positively transfer, e.g.:

*   right/left discrimination
*   estimating distance & degrees
*   giving directions/sequencing
*   procedures as building blocks
*   repetition of pattern/design
*   computer awareness
*   attention to detail

*   basic geometric shapes
*   keyboard familiarity/letters
*   problem solving/thinking skills
*   symmetry
*   up/down discrimination
*   spatial reasoning
*   independent learning

5. Children will from the earliest possible age will see themselves as in control of computers as opposed to controlled by them.

Rather than use commercially pepared packages, some educators prefer to program their own version of a pre-Logo language using a full scale version of Logo. A teacher-created pre-Logo language has two major advantages over commercially prepared versions: (1) teachers can easily modify the language to meet the special needs of their students or the task at hand;.and, (2) if the district already has a full scale version of Logo, no additional funds will be needed for the purchase of a commercially prepared pre-Logo language. The following, written using Apple Logo II (Logo Computer Systems Inc.), is an example of a teacher written pre-Logo program and illustrates the relative ease with which someone familiar with Logo can write such a "mini-language":

```
TO PRELOGO                      IF :KEY = "U [PU]
CS FS                           IF :KEY = "D [PD]
KIDLOGO                         IF :KEY = "S [ST]
END                             IF :KEY = "H [HT]
TO KIDLOGO                      IF :KEY = "C [CS]
MAKE "KEY READCHAR              IF :KEY = "E [PE FD 10 PD]
IF :KEY = "F [FD 10]            KIDLOGO
IF :KEY = "B [BK 10]            END
IF :KEY = "R [RT 30]            NOTE: TEACHERS CAN ADD ADDITIONAL COMMANDS OR
IF :KEY = "L [LT 30]            MODIFY THE ONES HERE BASED ON USER READINESS
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Writer's Helper Stage II: Innovative Software for Teaching Writing as Process

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Abstract: This presentation will examine <u>Writer's Helper Stage II</u>, an innovative microcomputer program designed to improve student writing through deliberate, research-based intervention during the prewriting, revising, and proofreading stages of the composing process. Selected prewriting activities and revising tools from the over forty in the program will be demonstrated from the perspective of teaching writing as process, and recommendations will be set forth for the integration of process-based programs such as <u>Writer's Helper Stage II</u> into effective computer-mediated writing instruction.

The microcomputer program <u>Writer's Helper Stage II</u>, developed by William Wresch at the University of Wisconsin, Stevens Point, is an exemplar of the state of the art in computer-mediated, process-based instruction in written composition. <u>Writer's Helper Stage II</u> is a collection of writing activities and tools for middle school through college students designed for deliberate, positive intervention during the prewriting, revising, and proofreading stages of the writing process. Prewriting, revising, and proofreading are the three stages of the writing process during which teacher intervention can have the greatest impact on the quality of the process that follows as well as that of the final written product. Furthermore, teaching writing as process is the key essential element at all grade levels as specified in the Texas essential elements for written composition. Programs like <u>Writer's Helper Stage II</u>, therefore, will become increasingly important since computer-mediated learning environments represent the most effective way of implementing process-based writing instruction.

<u>Writer's Helper Stage II</u> consists of (a) twenty prewriting activities designed to help students choose, explore, and organize their writing topics in preparation for writing first drafts and (b) 20 revising tools to analyze selected characteristics of a document to help locate problems with language and writing style. The prewriting activities always produce some writing (e.g., a paragraph, answers to questions, lists of items, an outline, etc.) which can be saved as text files and used with most word processors popular in school settings. After using a word processor to complete a draft of their final document, students use the revising tools to help identify problems with grammar and/or style. By using a process-based approach, programs like <u>Writer's Helper Stage II</u> not only help students improve the quality of specific writing assignments, but, when used frequently, help them develop an internal heuristic for good writing. The following is a list of the prewriting activities and revising tools which make up <u>Writer's Helper Stage II</u>:

PREWRITING ACTIVITIES

Find

- Starters: initial phrases to get writers started.
- Idea Wheel: Three wheels create random connections of words and phrases.
- Associations: a series of words to prompt ideas.
- Questioner: poses questions to help select a subject.
- Lists: helps create lists of possible writing topics.
- Brainstorms: a freewriting activity to help select/develop a topic.

Explore

- Crazy Contrasts: compares topic to another unusual topic.
- 3 Ways of Seeing: looks at topic in isolation, as a process of change, and in relation to other subjects.
- Audience: asks questions about potential readers.

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- Random Revelations: makes a series of random statements about the topic.
- Connections: helps find connections among lists of topic-related items.
- Teacher: up to 5 additional activities with teacher-supplied questions.

Organize Information
- Trees: groups thoughts about topic into categories and tree outline.
- Debating an Issue: solicits information on both sides of an issue and organizes it for writing.
- Structure Guide: a series of standard structures for formalized writing(e.g., lab reports, research reports, etc.). The structure guide can be used as a template for the final document.
- Goals: asks which of 8 common writing goals matches the writer's goal.
- Compare/Contrast: helps create an outline of similarities and differences between two topics.
- Outliner: full-function outliner to collect ideas and notes; it includes features such as collapse, move, & insert. Outliner can be transferred to a word processor & used as a writing template.
- Develop a Paragraph: guides in developing descriptive or argumentative paragraphs.
- 5 Paragraph Theme: uses answers to questions to create a rough draft of a 5 paragraph theme.

REVISING TOOLS

Structure
- Outline Document: lists 1st sentence in each paragraph as check for transition words and logical sequence.
- Paragraph Coherence: displays 1st and last sentence of each paragraph.
- Paragraph Development: reports number of words and sentences in each paragraph and graphs the number of words per paragraph.
- List by Sentence: lists sentences in the document, one at a time.
- Sentence Lengths: counts and graphs the number of words in each sentence.
- Category Match: compares to traits of newspaper, informative, scientific, and fiction writing.
- Subordinate Clauses: reports number of subordinating conjuntions per sentence.
- Word Frequencies: reports frequency count for each word in the document.
- Revision Summary: reports a table of results from the activities in this set.

Audience
- Readability Index: Uses Fogg Index to determine relative reading level of document.
- Diction Level: searches for particular words that demonstrate higher or lower diction levels.
- Transitions: counts/identifies standard transitional words/phrases in document.
- Prepositions: counts/identifies the prepositions in a document.
- References: counts/identifies the prounouns and vague words that require a reference.
- "To Be" Verbs: Checks for forms of "to be."
- Sweet or Stuffy: follows W. Gibson's standards to determine if document is sweet, tough, or stuffy.
- Audience Summary: reports table of results from the activities in this set.

Checks
- Homonyms: searches for commonly misused homonyms.
- Gender: finds gender biased words.
- Usage: checks for common mistakes in word usage.
- Teacher: create up to 5 additional checks for special sets of words selected by teacher.

Reference: Wresch, William, <u>Writer's Helper Stage II & Instructor's Manual</u>, CONDUIT, The University of Iowa, Oakdale Campus,Iowa City, Iowa 52242, 1988.

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USING COMPUTERS WITH "AT RISK" CHILDREN IN THE PRIMARY GRADES TO IMPROVE THEIR BASIC SKILLS

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PRESENTATION ABSTRACT: How does computer use affect the emerging literacy of young children? Does computer use have special value for "at risk" children? These questions and others will be addressed during this presentation which will include progress in a research project where computers are being used as instructional aids with children in the primary grades.

The 1980's find educators more aware than ever of the need to break the vicious cycle of school failure and dropout. A preventative measure to curb this problem is to address ways of assisting those children who have been identified as "at risk" of failure in school for academic and/or other reasons. Prevention will likely enable these children to have more successful experiences as they pursue their education. The use of advancing technology, e.g. computers, in the instructional program for these students may offer an answer to part of the problem, especially as we look at the skills of the emergent writer.

Since the early seventies, educators have placed emphasis on understanding how children develop print awareness and begin the writing process. Stice and Waddell say that among the things learned are: children know more about print than previously thought, they use a process of discovery and experimentation with print to develop strategies for spelling new words, and writing develops best when a variety of opportunities to explore print are complemented by direct instruction (Stice & Waddell, 1987). Early phonemic spellers should be given frequent opportunities to experiment with writing (Temple et al., 1988). Chomsky begins her article, "Write First, Read Later," saying "'Children ought to learn how to read by creating their own spelling for familiar words as a beginning'"(Wood, 1982).

It is in the area of beginning writing that many educators are heralding the use of computers. The Writing to Read program, which was developed by Dr. John Henry Martin and marketed through International Business Machines Corporation, is one program which is being used and studied. It is a multimedia educational system which incorporates the use of a computer in teaching children how to write what they have said and read what they have written. The Educational Testing Service (ETS) has researched the program and found it effective based on these seven conclusions: "1.Writing to Read works. 2. Children learn with Writing to Read. 3. Children in Writing to Read write better than comparison groups. 4. In reading, kindergarten Writing to Read students have a significant advantage over comparison students. In Grade 1, Writing to Read students compare favorably with other students. 5. Writing to Read Students perform as well as other students on spelling. 6. Teachers respond positively to Writing to Read. 7. Parents respond positively to Writing to Read" (ETS, 1984). This evaluation is especially significant because of its extensiveness. It included over 10,000 kindergarten and first grade students in 21 sites, and during the second year 3,210 students using Writing to Read were compared to 2,379 who were not (ETS, 1984).

Based upon these findings one can assume that computers, utilizing educationally sound programs, can be used effectively to improve children's basic skills, e.g. writing. Therefore, we need to analyze the potential of such use with "at risk" students and determine from which components they particularly benefit. This presentation will summarize an ongoing research project which is designed to help provide answers.

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SUMMARY OF THE LONG-RANGE PLAN FOR TECHNOLOGY OF THE TEXAS STATE BOARD OF EDUCATION

1988-2000

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The presentation will describe the Long-Range Plan for Technology 1988-2000 that was adopted by the State Board of Education. Each section of the plan--the vision, the priorities, the needs, the successes, the actions, and the requests from the legislature--will be addressed. Finally, an update on the status of the plan in the legislature will be provided.

This *Long-Range Plan for Technology of the Texas State Board of Education* plots the course for meeting educational needs through technology and for implementing concomitant changes in education from 1988 to 2000. Both technology and the field of education are fluid; applying advances in the former to the practice of the latter can help achieve a vision of education that has been as yet unattainable.

THE VISION: The education system that the State Board of Education envisions is one in which: 1) No student would be denied, by virtue of district sparseness or teacher shortage, course work necessary for employment or higher education; 2) Teachers can have both the responsibility and the technical resources to guide the instruction of their students in the most appropriate and efficient ways; 3) Performance, not processes, can determine advancement; 4) Performance and socioeconomic status are unrelated; and 5) Adults can continually enhance their job and life skills.

THE NEEDS: Multiple needs make the implementation of this long-range plan for educational uses of technology imperative. In addition to the realization of the board's vision of education, these needs include: 1) the demands of the state's economy; 2) legislative mandates; and 3) the *Long-Range Plan of the State Board of Education for Texas Public School Education, 1986-1990*.

The traditional sectors on which the Texas economy has relied--oil and gas production, manufacturing, and agriculture-- are shriveling in comparison to expansion in the service sector. These employment shifts have profound implications for education, for the jobs of the future will belong to the educated. Insufficient education and resources threaten quality of life, individual earning power, and the state's fiscal health, producing multiple social and economic repercussions.

Legislative mandates include: 1) Chapter 14 of the Texas Education Code which specifies long-range plan for instructional uses of technology; 2) TEC 11.33(b)(1) which requires financial assistance for computer services offered by regional education service centers; and 3) VTCS 4413 (32h), Section 2.08 which authorizes the Information Systems Long-Range Plan.

Finally, the mission of quality, equity, and accountability of the State Board of Education as stated in its *Long-Range Plan* and actions stipulated in that plan necessitate technology. A gap in achievement exists between minority and non-minority students on TEAMS and between Texas students and national norms on other tests. In addition, teacher shortages are potentially severe. Equity also is threatened through the imbalance in course offerings across the state: 1) While the largest districts in the state offer an average of over 200 courses each, the smallest offer approximately one-quarter as many; 2) Districts with a low percentage of low-income students offer an average of 20 percent more courses than do those with a high percentage of low-income students. In addition, population density tends to determine curriculum richness. Technology can alleviate that problem. Technology can also improve accountability through reduced paperwork burdens and increased information sharing.

THE SUCCESSES OF TECHNOLOGY: Although no single solution can meet all of these needs, technology has been shown to contribute significantly to overcoming them. Research has shown that the use of technology can have

a positive impact on student achievement, especially in basic skills, with at-risk students, and with special education students. In addition, technologies such as distance learning and telecommunication can increase efficiency at all levels of the system. For example research has shown that: 1) Instructional television can increase student achievement; 2) Computer-assisted instruction (CAI) can improve basic skills acquisition by approximately 10 percentile points; 3) CAI has contributed to a rise in higher-order thinking skills of at-risk students of up to 25 percentile points; 4) Adaptive/assistive devices can increase attention span, retention, and problem-solving skills of special education students; 5) Distance learning is a proven means for providing effective instruction and inservice; and 6) A fully implemented statewide telecommunications system can save a projected $2 million annually.

THE APPLICATIONS OF TECHNOLOGY: With the application of current and emerging technologies to education, students can work at their own pace, following the learning style most appropriate to their needs and skills and accessing libraries of information bases. Teachers' workstations can be multimedia productivity centers from which teachers can present visual and sound demonstrations, monitor individual student progress, and conduct formerly tedious paperwork automatically. Administrators can review and aggregate data on achievement, teacher assessments, expenditures, and inventories and communicate rapidly with other education institutions. Entire communities can be served by campus learning centers where adults can improve their literacy and job skills.

THE ACTORS AND THE ACTIONS: In order to realize the vision and meet the economic, legislative, and educational needs, coordinated effort is necessary by all levels of the public education system, by developers and vendors of current and emerging technologies and of the software and courseware that make them useful, by researchers who investigate and report on successes and inefficiencies, by institutions of higher education that prepare teachers for tomorrow's classrooms, and by communities and the state that must support and will benefit from citizens who are skilled and self-reliant. This plan helps coordinate the necessary actions by these participants.

The calendar for implementing the plan is divided into three phases of four years each. Key actions by the state during Phase 1 (1988-89 through 1991-92) include: 1) Establish a technology allotment fund of $50/ADA/year on an equalized basis for district hardware and related purchases; 2) Reinstate support for instructional television; 3) Appropriate $16.65 million to implement the plan; 4) Establish a statewide electronic information transfer system; 5) Establish a research and development consortium and demonstration programs; 6) Expand distance learning by building on available services; 7) Authorize expenditures for technological systems through the Foundation School Program and other legislative changes; 8) Assist districts with selecting and acquiring equipment through revising arrangements with the State Purchasing and General Services Commission; 9) Incorporate courseware adoption into the textbook adoption process; 10) Revise curriculum rules; 11) Support teacher and administrator training in and by technology; 12) Through a State Board of Education Advisory Committee on Technology Standards, establish quality, technical, functional, security, service and other standards for equipment, courseware, and training; and 13) Establish Equipment Targets for districts and campuses.

Key actions by regional education service centers include: 1) Establish Technology Preview Centers; 2) Core services include training and other assistance to districts in technology selection and use; and 3) Employ at least 1 full-time equivalent at each regional education service center to perform these functions.

Key actions by districts during Phase 1 include: 1) Prepare annual district and campus plans for technology; 2) Provide training to staff, including induction year teachers, in appropriate uses of technology; 3) Provide incentives for staff to use technology; 4) Procure and integrate hardware and software according to local plans and State Board of Education Equipment Targets; 5) Use integrated telecommunications systems for instruction, inservice, and information sharing; and 6) Participate in demonstration programs.

Institutions of higher education are called on to incorporate technology in undergraduate and graduate instruction and training and to conduct and disseminate research in educational uses of technology. The consortium will, during Phase 1, initiate research projects for value-added development and marketing by member companies of educational applications of technology.

HyperCard: The Ultimate Tool for Teachers

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In this workshop session, the participant will have an opportunity to explore various possiblities of HyperCard - from merely perusing a HyperCard stack written by others to actually authoring a stack of his own, and to a limited extent, the use of HyperTalk, the scripting language of HyperCard.

I usually entitle this session "HyperCard - The Tool of the Future" because I really believe it is. This is a tool that allows you to access information in new and different ways, a tool that lets you organize and work the way you think, by association. And yet, this is a tool that is almost as easy to use in the authoring mode as it is to use in the user mode; i.e., to "create or author" HyperCard stacks as well as to merely "browse" stacks that others have created.

Do you remember the Logo language that many of our teachers and school children were introduced to a few years back? This language was touted as a very easy to use (as well as a very powerful) language that could be used to enhance the process of teaching children (and adults) how to think; a language that could be used to facilitate the learning of certain concepts such as directionality, colors, motion, etc.

I like to think of HyperCard in the same light. This is a powerful tool that may be used by virtually anyone that knows how to use a Macintosh. The hardware that holds the information of today is only as powerful as the software that allows our population to access and deal with that information. I believe that HyperCard will allow us to focus more on content and relationships between information because we don't have to follow predetermined organizational schemes. To work with HyperCard, we don't have to be programmers. This tool will allow us to put information delivery into the hands of everyone - not just computer professionals.

Reference materials you may be interested in are as follows:

1) The Complete HyperCard Handbook, Danny Goodman (Bantam Books)
2) The HyperCard Handbook 1.2 Upgrade Kit, Danny Goodman (Bantam)
3) HyperCard Developer's Guide, Danny Goodman (Bamtam Books)
4) Hands-On HyperCard by Mimi Jones and Dave Myers (John Wiley & Sons)
5) Understanding HyperCard, Greg Harvey (Sybex)
6) Wings for the Mind, Apple Computer
7) HyperCard Script Language Guide, Apple Computer

As in all my workshop sessions, if you have a blank disk, I will have something you can copy. There are many public domain disks available for HyperCard users. One in particular that I have was designed by Dan Earle at Louisiana State University to be used with Danny Goodman's HyperCard book. There are many others available. Also, Heizer Software offers a wide variety of reasonably-priced HyperCard stacks.

Come to this session to learn, to create, and most of all to have `fun!

TESTING FOR UNDERSTANDING IN COMPUTER LITERACY

Dr. Jerry P. Galloway

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*A written test, used to examine the acquisition of
fundamental computing concepts, and field test data will be
presented. A case is made for the importance and validity of
examining students' understanding of computing aside from their
performance skills.*

The education of teachers to include training in computing is
on the rise (Bruder, 1988). While it may be true that today's
youth, considering their experiences with computers, could
eventually diminish or change the need for computer education,
the need for proper education in computing is stronger now than
ever before. A formal computer literacy course is the currently
accepted format in Texas for meeting that need. However, how to
deliver effective instruction and achieve well educated students
in computer literacy has not been clearly established.

The issue of whether it is better to develop an in depth
understanding of computing activities and related computer
functions or instead to simply develop operational protocols for
performing specific computing task? has only begun to be explored
(Hobbs & Perkins, 1985). It is the position of this author that
at least some degree of understanding, a conceptual base from
which skills and abilities may grow, is an essential part of
achieving computer literacy.

An important and necessary part of properly educating
computing students is the process of assessing what they have
learned. However, class projects and tests in computer literacy
typically address the tasks of computing and the skills necessary
to complete those tasks, answering the question: Can the student
perform this or that computing task? Rarely do they specifically
examine the fundamental concepts of computing which will
ultimately play a more important role in the student's ability to
adapt to future computing situations.

While there are a variety of ways to explore a student's
understanding, one method has been developed. A 40 item test to
examine five fundamental concepts from three perspectives was
administered as a pre/post test to 27 volunteers in the Spring,
1987, semester of a typical college level computer literacy
course. Items were classified by concept (command, data, file,
language, and program; 8 items each) and were distributed among
three types (attributes, 14; examples, 10; analogies, 16).

Reliabilities for the pretest and posttest were .92 and .76,
respectively. The differences between pretest and posttest mean
scores were significant at the .002 level (pretest mean = 13.4,
posttest mean = 23.6) indicating substantial improvement during
the course.

Although the subjects did improve, it was discovered that

they retained serious misconceptions about fundamental computing concepts and did not do as well with attributes (51%) and analogies (54%) than with example questions (74%). Aside from the potential difficulties in their own computing, these erroneous notions could conceivably be passed to future students of these preservice teachers. The written test proved particularly useful in identifying the incorrect notions about computing.

Five sample questions (displaying the addressed concept and question type) are displayed here from the original test:

_____ requires execution.

    (a) Data   *PROGRAM*
    (b) A program   *ATTRIBUTE*
    (c) A file
    (d) A computer language

A command is most like _____.

    (a) light from a glowing light bulb   *COMMAND*
    (b) a light switch   *ANALOGY*
    (c) electricity in a glowing bulb
    (d) electrical wiring

_____ exists only on a disk.

    (a) A language   *FILE*
    (b) Data   *ATTRIBUTES*
    (c) A file
    (d) A program

Fire drill procedures are most like a _____.

    (a) computer language   *PROGRAM*
    (b) file   *ANALOGY*
    (c) command
    (d) program

A set of traffic laws and regulations are most like _____.

    (a) a computer language   *LANGUAGE*
    (b) a command   *ANALOGY*
    (c) a file
    (d) none of the above

Bruder, I. (1988). Electronic Learning's 8th annual survey of the states, 1988. Electronic Learning, 8(2), 38-45.

Hobbs, R., & Perkins, D. (1985). Rituals and models: Students' understanding of the computer. Position Paper: Educational Technology Center, Harvard Graduate School of Education, Cambridge, MA.

Computers, Cooperative Learning, and Elementary Social Studies

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A project was conducted to use cooperative learning with computer assisted instruction. Sixth grade social studies students used the Where In The World is Carmen Diego software to study world geography. The project was considered a success by the instructional team.

Cooperative learning is a teaching strategy that has been ignored by many educators for the past fifty years. Fortunately, there has been a rekindling of interest in cooperative learning through the efforts of Robert Slavin, the Johnson brothers and others. The presenters in their efforts to employ cooperative learning techniques decided to utilize Apple IIGS computers and the Where in the World Is Carmen Diego software.

Three sixth grade social studies classes were used in the project. The sixth grade social studies curriculum's focus on world history and world geography made Where in the World Is Carmen Diego an ideal software choice.

Each class was divided into four groups of six students. The teacher selected the groups to insure a heterogenous grouping based on reading ability. The students were then provided an orientation on the cooperative group process.

The next step of the project entailed familiarizing the students with the support material associated with Where in the World Is Carmen Diego. The students were then briefed on the six roles that were assigned to each of the cooperative learning groups. Those roles were: computer operator, dossiers manager, atlas reference, miscellaneous reference, almanac reference, and recorder. Each student would rotate roles in the group after a case was solved on the software. The students were permitted to name their groups as a form of motivation and were allowed to use that name when interacting with the software.

Students were given the test objectives and general question format at the beginning of each week. They were also informed that test would be held on each Friday. Students would receive their individual grades based upon their own performance, however, to receive the group reward their scores were compiled to produce a team score. The rewards varied from

food to free time in the computer lab. The six students on each team had to have combined score of 540 points in order to receive the group reward. This cooperative strategy increased the group's interdependence upon each other.

A further motivational strategy was included in the software itself. Student groups were initially assigned the rank of "Gumshoe" by the software. As the students successfully completed cases they would increase in rank until they were assigned the rank of "Ace".

The presenters used their time actively monitoring the groups. Students were provided assistance in learning to manipulate the software and in using the reference material in solving the cases presented in the software. The presenters also monitored the groups for cooperation and conflict. Groups that were on-task and meeting the cooperative goals were individually and collectively praised. Groups that were having difficulty functioning as a group were provided guidance in conflict management. Only two of the twelve groups in the project experienced severe internal conflict problems.

Overall the student behavior and comments indicated great enthusiasm for the project. When the project was concluded there was much begging by the students for it to continue. Student scores on exams indicated a high level of mastery with an increase in the test scores of the lowe: reading level students. The project will be repeated this year and expanded to the fifth grade using the Where In The United States Is Carmen Diego

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Ignorance IS Bliss!

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ABSTRACT

This talk will address the topic of data abstraction. That is, how problems may be simplified for users (and students) by concentrating on the operations performed on data types as opposed to the implementation of the data type itself. Examples will be given in Pascal and ADA with a discussion of how abstract data types are supported by each language.

Abstraction was defined by Ledgard and Taylor as follows: a general idea which concentrates on the essential qualities of something, rather than on concrete realizations or actual instances. [1] Lomuto described abstraction as a fundamental tool of problem solving which is "the process of replacing a specific detail with a more general description." [2]

With regard to the computer science field, we might restate the definition for Data Abstraction as follows:

Data abstraction is the method through which one concentrates on the values and operations associated with a given data type (or data structure), rather than the actual implementation of those values and operations.

Through the use of data abstraction in problem solving, one attempts to separate the "what" of what is being done from the "how" of how it is actually accomplished. For example, the fact that the results of integer operations, say division, is always an integer is the "what". "How" that is actually implemented by the language is seldom of concern to the user. In addition, the fact that certain functions are designed to accept only integer type parameters associates these functions with the data type. Again, the user needs only to know "what" he/she can or cannot do, not "how" those restrictions are enforced by the system.

The idea is to get students and programmers to take a similar approach in their problem solving. The first step is to attack the problem itself, with the help of data abstraction, and then to attack the coding of the solution.

The traditional approach to implementing the idea of data abstraction has been through the use of subroutines. This method worked relatively well with FORTRAN. However, the newer block structured languages, such as Pascal, which have tighter scoping rules caused the methods utilized in FORTRAN to be difficult, and in many cases impossible, to implement.

Thus, researchers began their "search" for new methods through which to implement abstraction. As a result the topic of data abstraction received a great deal of attention through research in the late 1970's, and by 1977 the term data abstraction had evolved.

However, data abstraction is still a relatively new concept to many in the computer science field. One reason is that while the idea itself is quite straightforward, it has not been directly supported by the programming languages most commonly in use, namely FORTRAN, COBOL, and BASIC. The "newer" languages, however, such as Turbo Pascal 4.0 and ADA directly support the use of data abstraction by allowing the programmer to associate with a data type not only a set of values, but also all allowable operations which may be performed on the data type, both "built-in" and user written.

For example, a notation that might be suitable for such associations is an expansion of the traditional Pascal definition as shown below where the definition describes the allowable values and the operations names the operations which are allowed to be performed on the data type. [3]

```
TYPE name
     DEFINITION
          scalar or structured type definition
     OPERATIONS
          procedures or functions
END name;
```

The reason to use data abstraction is that it is a problem solving tool. A major problem in developing systems is not coding; it is problem solving. Students, and programmers, have difficulty designing reasonable solutions to the problems posed. Data abstraction provides a method for generalizing the solution to a given problem, thus simplifying the process, and, hopefully, allowing more flexible systems to be developed. According to Bishop by taking the abstract approach in any area the human's task is reduced in two ways. The first is that the person may communicate in the terminology familiar to the object or data type, as opposed to the terminology of the actual implementation. Second, the complexity is reduced because the actual implementation is not of concern to the individual. [3] Once a generalized solution has been developed, the actual implementation is addressed and the coding is done.

The addition of data abstraction to our "bag of tools" simply makes our ability to design and program GOOD code immensely greater. Thus, we as programmers are more productive and marketable.

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[1] Ledgard, H. F. and R. W. Taylor, "Two Views of Abstrac-
     tion", CACM, 20(6), 1977
[2] Lomuto, Nico, Problem Solving Methods with Examples in ADA,
     Prentice-Hall, 1987
[3] Bishop, Judy, Data Abstraction in Programming Languages,
     Addison-Wesley, 1986

Integrating the Apple Computer in a High School Correlated English Classroom

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This presentation will discuss a teaching strategy which uses three learning centers and integrates the Apple computer with state adopted text books for a correlated English class.

This presentation will discuss a teaching strategy which uses three learning centers and integrates the Apple computer with state adopted text books for a correlated English class.

The learning centers are: a computer center, a reading center, and a writing center. The material used in all the centers interrelates on a daily basis.

Over a week's time, the computer center is designed to allow students to practice and review spelling, to review at least two TEAMS objectives, and answer questions taken from their literature text book concerning the week's reading assignment.

A class is about fifty-five minutes in length and contains about 20-22 students, nine single drive computers, and an instructional aide. All of the software used is commercial but allows teacher input which is the major reason why this teaching strategy is successful. The commercial software used is

Teamwork : Educational Software and Marketing Company
Grammar Gremlins: Davidson and Associates, Inc.
Spell it!: Davidson and Associates, Inc.
Newsroom: Springboard Software
Word Attack: Davidson and Associates, Inc.

Details concerning how to adapt commercial software to this program, how to record keep, and how to co-ordinate and manage the three learning centers will also be presented.

ColorWorks Across the Curriculum: Today's T.I.P.S.

Roxanne Kay Harbert
President
FILETTE KEEZ™
3204 Channing Lane
Bedford, Texas 76021
(817) 283-5428

Color is MAGIC....connecting software to curriculum and students
to learning. Reflections of the research and development of the
Teacher Inspired Product Systems. Descriptions of installations
from elementary, high school and college levels. Demonstration
of new paper products designed for easy access, complete care and
efficient check out. Workshop suggestions that plan organization
of diskettes and documentation to motivate, model and manage.
Celebrate teacher successes! Imagine curriculum in COLOR.....
categorized to communicate and extending into the classroom.

> **Reflective look at the research and development of
> the Teacher Inspired Product System now available.**

The presentation is a "show and tell" update about a simple idea
made useful. How do you organize diskettes and documentation to
everyone's best advantage...reaching students? Pioneering '80's
style, teachers at three pilot studies in Dallas/Ft. Worth put
the pronoun "I" into the theory: _F _T LOOKS ORGANIZED, _T _S.
The challenge was SIMPLICITY and easy use. COLOR was the key.
"Housekeeping" software with handmade paper pieces established
routines and helped parents and students understand expectations.

> **Montage of pilot schools and installations that
> planned flexible, custom computer labs from dreams.**

Teachers had questions and worked out answers to change an
overwhelming extra into a new friend and powerful tool across the
curriculum. They identified goals for the "Dream Lab" that would
protect investments of planning time and class time; show respect
for materials and respect for others. In short, teachers invented
diskette organizing systems with common sense and convenience.
They "professionalized" software by labeling where it belongs.

> **Demonstration of paper product options for complete
> care and control at elementary, high school, college.**

Isn't something user friendly when it is understandable at a
glance? There are seven beautiful colors for the five new paper
products created from combined imaginations. The two-piece pocket
folder files in a drawer to hold diskettes and all the "stuff"
that comes in boxes and binders. The matching filette, jacket,
card and label open new management styles because fingertip files
are possible. FILE TE KEEZ™ is a company (teacher) focused to
get technology out of the box and into the hands of students.
There are many right plans and CHOICES make the difference!

**Critical thinking suggestions to help analyze needs,
assess goals and develop patterns toward the future.**

1. Describe conditions   - Collect data
2. List problems   - Collect viewpoints
3. Rethink in parts   - Role play
4. Interpret for to ay   - Project for tomorrow
5. Discuss solutions   - Translate needs
6. Focus objectives   - Agree on goals
7. Propose plans   - Transfer to actions

In retrospect, these strategies solved the "software nigntmare"
through trial and error. Accomplishments together bring pride.
Ownership of the system is the important part of installation.

**Workshop activities to focus objectives, involvement,
EZ-use, accountability, resourcefulness and growth.**

Technology is a wonderful place to pioneer. Make learning school
business; it is. "Mark-it" curriculum! Recording a diskette is
functional. If teachers can't find it, they don't use it. Color
divides inventory into smaller categories. The side benefits come
later. Teachers feel supported. They are the KEY sales force and
strongest link to students. When software is advertised, new
questions arise. Hurrah! Discoveries are made when people get
involved. Value for technology is use, improvement and sharing.

**Emphasis on "People Connections" to extend talents,
attitudes and technology into the hands of students.**

From Texas to Louisiana, from West Virginia to Illinois, to
Florida and California, teachers are proving that make it work
means make it EASY. Lesson planning with technology is the
front er for teachers. The true beauty of a system is not the
color, but the spirit it models. "ducation is not a wish. It
is something to make and to do. Designing instruction in new
settings is creative. Recommending new plans is insightful.
Encouragement can be genius. Einstein reasoned: "Imagination
is more important than information". Dreams must be given away.

**Opportunity to imagine the probabilities when teachers
succeed in linking software throughout curriculum.**

When teachers believe in their wizardry, magic happens and
education leads. Today's T.I.P.S. are from classroom teachers.
district coordinators and high school administrators. They are in
public and private schools, libraries, media, service and business
c. ters. Caring is professional. For computer clubs and college
students to kindergartners, today's T.I.P.S. are self-reliance and
remembering the value of "what if". The truth is that rarely do
teachers celebrate success. They're busy like Mother Teresas
because "We can do no great things, only small things with great
love". FILETTE KEEZ™ salutes teachers for their courage and
d o mination. It's called hope. Take time to celebrate because
we honor one another when they listen. It's called respect.

Distance Learning:Texas Public School Report

Gary Haseloff
Texas Education Agency

Abstract

In Texas and nationally distance learning has made sudden inroads in public schools as an alternative delivery system. The author suggests some reasons for the growth and presents some facts about the status of the method in Texas public schools. Distance learning is dependent on a variety of technologies, principally on telecommunications. The range of programs, tools and some applications are addressed. The future of distance learning including some of its survival needs and underpinnings conclude the presentation.

Five years ago, Texas had few students in its public schools that took high school credit courses by television. So, why has the practice suddenly blossomed in the 1980's? Is it another flash in the pan that will lose its glitter or is there something substantial this time that makes today's distance learning different from yesterday's? Is the phenomena due to advances in technology or are there also significant other factors driving the growth?

Certain things are apparent. One is that about 5 years ago small and or rural school districts were told by the state legislature to offer certain courses to students and additional credits were required to graduate from high schools. Another factor was a growing problem of finding and hiring teachers for some of the courses needed or desired. The new curriculum requirements and later reforms also created a need for training and retraining of educators. The results were that schools needed courses and access to training and other information which they had little way of getting, state mandate or not.

Another factor was that the relative cost for telecommunications technology had been dropping for several years. It seemed almost affordable and manageable for public school institutions. Possibly educators had grown used to easy electronic access to information, supplemental instructional television, college tv courses, and how-to-do-it video cassettes. Then, there was slight but seemingly significant switch in the technology, it became "interactive". Somehow the ability to hear the student talk back to the teacher via tv, or radio, or telephone became the magic added ingredient to catch the educators attention. Delivery of talk, data, video via satellite has been common since the early 70s, yet suddenly it appealed as the medium of choice to deliver not just instruction, but courses of study to widely dispersed student sites.

After InterAct in 1985 came TI-IN out of San Antonio and about the same time a program began at Region 9 in Wichita Falls. Then came the Instructional Materials Center UT Austin and Oklahoma State University out of Stillwater. Where InterAct used instructional television fixed service (ITFS), TI-IN used satellite broadcast in the Ku-band, Region 9 used a commercial tv station and later switched to telephone and placement of video tapes at the schools. EIMC at Austin used telephone to deliver a single vocational course. Oklahoma State used full C-band video and due to the Star Schools funding another operator, SERC, began delivering full video courses by satellite in 1989. Several of these systems also have added uses of computer telecommunications, keypads or electronic writing pads, cordless telephones and printers to their student sites.

In the fall semester of 1988 about 175 school districts in Texas were using the distance learning courses from the previously mentioned operators. About 2900 students were enrolled in a total of 26 courses. Compare this to a total of 1060 (+-) districts in the state with well over 3 million students and a 7-12 curriculum of 336 academic and 531 vocational courses. Yes DL is still very small, yet it continues to grow. How far might it go toward a new way to deliver instruction? Will it make inroads in the metropolitan school, in the non-rural and not-small schools? What is possible and what are the barriers? What will technology add to the possibilities?

Actually distance learning is already being used in some not-rural schools. Metropolitan districts may in the long run become the most prolific users of the technology and the services. In the InterAct system, in the Houston metroplex, several using districts are in fact rather large and certainly are not geographically isolated. Also, if one includes teacher and administrator training, or human resources development as it is called in business and industry, then distance learning will continue to be driven by expanding and constant needs expressed by almost all schools.

The future of distance learning is not easy to predict. Many factors could cause it to languish, but, more than likely, it will continue to grow. First, hardly anyone can demonstrate that it does not work as well as on-site managed instruction as far as our usual performance measures can ascertain. Distance learning students do as well as other students in learning the skills that we measure. The key factors in how well it works are instructional design and on-site environment. These are usually also the key factors in on-site managed instruction.

Other reasons that it will likely continue are the new stimulus of federal funds through the Star Schools program linked with a society which is fairly comfortable with the technology and a need to explore efficient new ways to access quality education. There is the probability that improved schooling methods can evolve easier in distance learning programs than through the regular classroom, that costs for distance learning will decline, that the merging of technologies will make it more personal, more efficient, and more attractive and that it offers flexibility for districts to expand their curriculum without to many barriers.

Adding technology, such as using computer telecommunications, to increase student-to-student communications and their access to library services should help. The addition of student keypads and digital pads for response systems, the use of fax and computer printers for delivery of hard copy between teacher and student, and the developments in high definition video should all add to the usefulness of distance learning. One significant factor may also be the widespread availability of new telephone systems and additional satellite bands used to deliver data, voice, and video inexpensively, on demand narrow audiences as well as mass audiences. These communications technologies should make "interactivity" much more real time and comfortable. In turn, combined with possibilities for on-site storage, with student-empowering tools, multimedia resources and artificial intelligence materials, distance learning could be a significant modifier of the places and ways of schooling.

However, it is the author's belief that distance learning has no special magic to make it competitive with other alternatives that are also available to our society. Indeed if distance learning does only what it tends to do currently, which is emulate traditional teaching, it may fall into disfavor. If on the other hand, it seeks to raise the quality of instruction and instructional design, adopts a variety of technologies as partners in the delivery system, modifies instructional/learning methods by application of technology, and competes with currently mediocre instruction at a fair price, then, distance learning could lead the way to new schooling models.

Once Upon The Future

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Once Upon The Future presents ideas for teaching a unit on the future of computer technology to Middle School Computer Literacy students. Included in the presentation are classroom activities, individual and group projects, bulletin board ideas, an exploration of robots and artificial intelligence and computer education resources and reference information.

Enter the world of computers present and future and discover how new technologies will affect our lives.

The following is an outline of the topics and activities to be examined in this presentation.

1. A Look At The Past - A brief history of computers, robots and artificial intelligence.
2. Classroom Activities and Lesson Ideas.
    A. Let's Redesign the Egg!
    B. Future City
    C. Design a Computer
    D. Robots - Fact or Fiction?
    E. Robotics Project - Building the ̄ am
    F. A Vision of the Future - Predict how computers might be used in the future.
    G. The Great Computer Debate
    H. Meet the Smart Machines
3. Bulletin Board Ideas
    A. Computer Careers Today and Tomorrow
    B. A Roadmap to the Future
    C. Ask A Smart Machine
4. A Visit to the Computer Museum
5. Sources and Resources

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THE GEOMETRY OF ALGEBRA AND TRIGONOMETRY:
SYMBOL MANIPULATION AND FUNCTION PLOTTING SOFTWARE CHANGE THE WAY WE TEACH HIGH SCHOOL MATHEMATICS.

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Complex algebra concepts can be made available to less capable students using the geometry of algebra. These concepts are illustrated by function plotters. Identities in trigonometry can be discovered in a laboratory before they are proved. Measurement techniques available on this type of software allows students to discover the a, b, c, and d in the typeform, $y=asin(bx+c)+d$.

A very interesting way of introducing trigonometry identities is to have students discover the identities by measuring the type form a, b, c, and d values from a graph of the original function. We start by observing which type form might be best to use in starting the identity modeling procedure.

(1) The general forms are $y=asin(bx+c)+d$ or $y=acos(bx+c)+d$

(2) The example in this article is $y=sin (x)+cos (x)$.

y=sin (x)+cos (x)

(1) A preliminary graphing of this function indicates that it seems to model a cosine wave and that it could be measured on a graph with a normal period and a vertical scale 1.5 units high. Use cursor controls to determine that y=1 bounds the top of the function. (See ordered pair at bottom of graph. This ordered pairs describes the coordinate of the cursor that you see on the graph.)

(2) Using cursor controls again one can determine that $y=.5$ bounds the bottom of the curve. The axis of symmetry is in the middle at $y=.75$.

(3) The above measurements determine that $a=.25$ (half the distance between .5 and 1), and that the displacement, d, is .75 units above the x axis.

(4) Further observation indicates that there are 4 periods in 2 radians so $b=4$.

(5) There is no horizontal displacement so $c=0$.

(6) Substituting the values $a=1/4$, $b=4$, $c=0$, and $d=3/4$ in the type form $y=acos(bx+c)+d$ gives the identity $y=.25cos(4x)+.75$. The graph of this function overlays the original, thus it is an identity for it.

(MATHEMATICS EXPLORATION TOOLKIT - IBM)

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$y = \sin^4(x) + \cos^4(x)$

▷ (-1.57, 1.01)

$y = \sin^4(x) + \cos^4(x)$
$y = 1$

▷ (-2.42, 0.51)

RAD

$y = \sin^4(x) + \cos^4(x)$
$y = 1$
$y = \frac{1}{2}$
$y = \frac{3}{4}$
$y = a\cos(bx+c)+d$
$a = \frac{1}{4}$
$d = \frac{1}{2} + \frac{1}{4} = \frac{3}{4}$
$b = 4$
$c = 0$

▷ y=1/4cos(4x)+3/4

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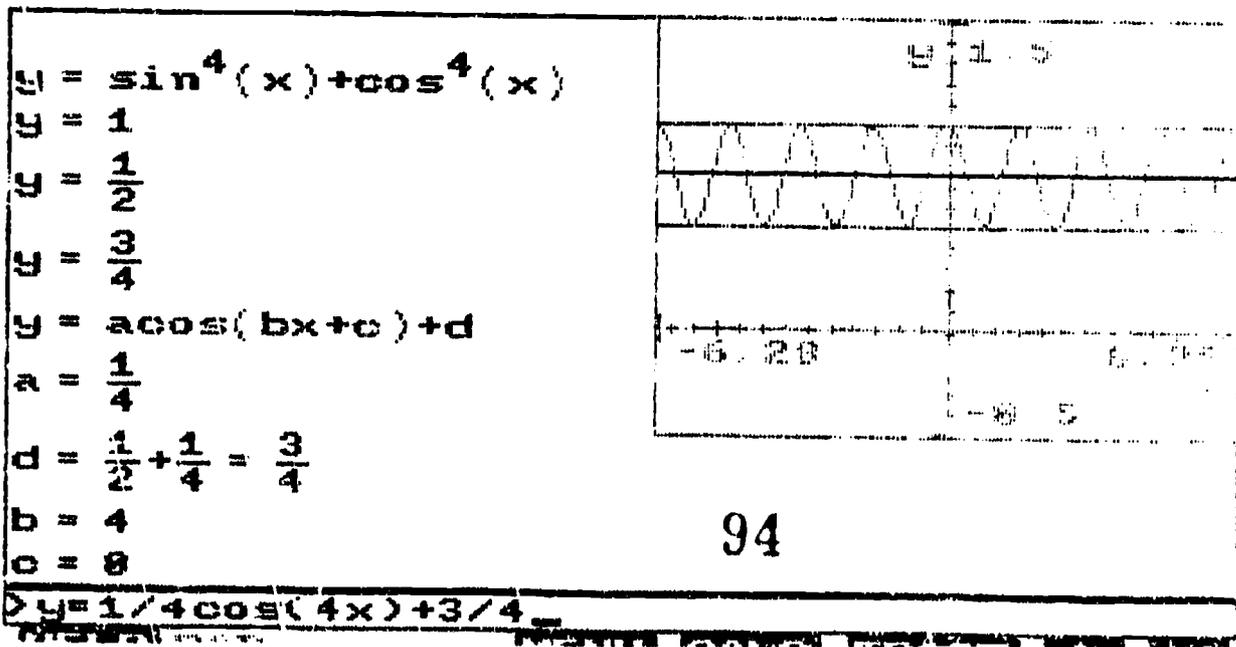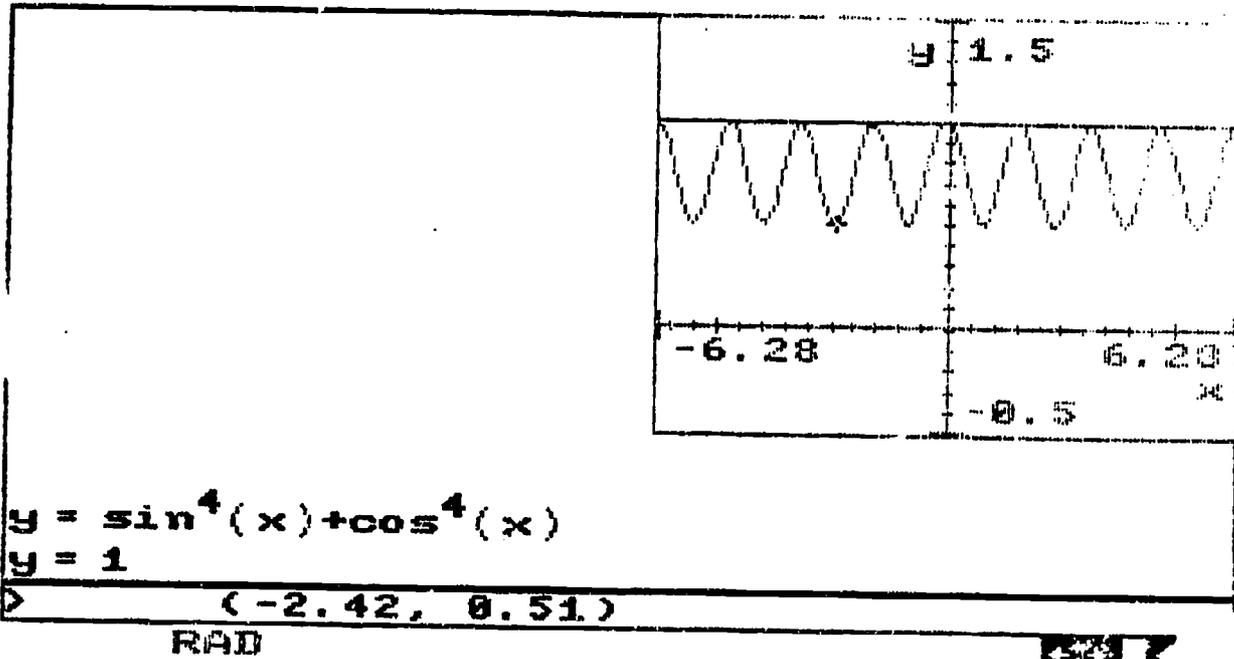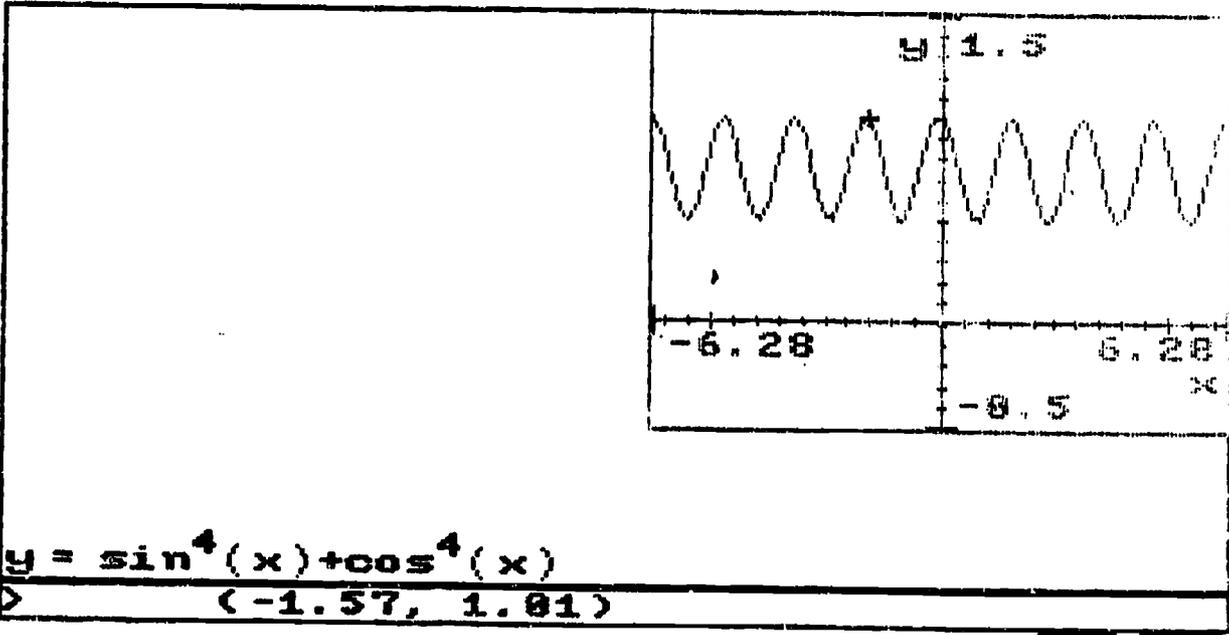
Taking Turing to the High Schools

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Abstract. The Turing programming language has been used in university classes in Canada since 1983 to teaching programming concepts. Since Fall 1987, Turing has been increasingly used in Ontario high schools as a replacement for Pascal and Basic. Teachers have adopted it because it supports good programming practices (structured programming), it is easy and fun to learn, and it comes with a complete set of teaching materials.

Introduction

In 1982, the University of Toronto was faced with choosing a programming language for teaching introductory programming. After a great deal of study and research, Professors Richard Holt and James Cordy designed a new programming language that is easy to learn and includes those language features that are necessary for teaching good programming habits. The resulting language, named Turing after the Computer Science pioneer Alan M. Turing, includes all the features of Pascal and more.

In Fall 1987, after five years of highly successful use in universities, the decision was made to introduce Turing into high schools. This introduction entailed development of a high speed version of Turing for IBM PC compatibles, publishing teacher materials, and giving courses for high school teachers. By now, just a year and a half later, ten per cent of Ontario high schools have switched to Turing from Basic or Pascal.

Turing Compared to Basic and Pascal

The most used language for teaching programming in high schools is Basic, so Turing will be introduced by comparing it to Basic. The short Turing program on the left is compared with the equivalent Basic on the right.

TURING	BASIC
var weight : real	10 PRINT "Give weight (pounds)"
put "Give weight (pounds)"	20 INPUT WEIGHT
get weight	30 PRINT "In kilograms: ", WIEGHT/2.2
put "In kilograms: ", wieght / 2.2	

The main difference in these examples is that Turing requires you to use a declaration (var weight: real), to say that weight is to be a variable.

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This example shows how declarations are helpful to the programmer. There an error on the last line of the programs, namely, weight is misspelled as wieght. Since Basic does not require declarations, it cannot warn you about this error. The Basic program runs and outputs 0 (zero) for the answer without warning, no matter what you type as input. By contrast, when you try to run the Turing program, the Turing software tells you that that wieght is wrong, because it has not been declared. This illustrates Turing's design goal that a language should make programming easier, by helping you to eliminate bugs.

Turing's if and loop constructs together with its subprograms guarantee that students learn the good habits of "structured programming". By contrast, Basic encourages the opposite, namely, the bad habits of "spaghetti programming". Turing provides all the features of Pascal and more, but avoids Pascal's wordy and confusing syntax.

Teaching Support

The first thing developed explicitly for high school use of Turing was a high speed compiler for IBM PC compatibles that provides immediate execution of student programs. This programming environment encourages students to try out programming examples and to learn through exploration.Working closely with high school teachers, a student text, the Turing Tutorial Guide, was written by Prof. J.N.P. Hume of the University of Toronto. This was followed by the Turing Teacher's Manual that contains overhead slide masters, quizzes, and exercise answers all keyed to the Tutorial Guide. The newest software to be provided are electronic lessons that review key material in the first part of the Tutorial Guide. These lessons use simple computer animation to help students visualize concepts such as file access, loops, variables, simple graphics, and so on.

A hot line was provided so teachers could telephone to get answers to questions about the software. A number of students requested use of the software on their home computers, so they were provided home versions of Turing software at half price. A quarterly Turing newsletter as established to keep teachers up to date with development and to allow them to share ideas and experiences. This newsletter has proven to be extremely successful, especially as a vehicle for teachers to keep up with the rapidly evolving science of teaching programming.

Future Development

This development of Turing materials continues, with the latest being an Apple Corporation sponsore... Macintosh version Turing that is already in experimental use in high schools. The overall project goal remains: to provide appropriate and up to date materials to assist the teaching of programming. With this goal and with ongoing close interaction with high school teachers, new software and materials are constantly under review and development.

LXR•Test: The Ultimate Test Management Program

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This will be a report on *LXR•Test* by an independent reviewer and beta tester with years of experience in computerized test management, administration and scoring. The demonstration will be a live application of the program on a Mac II with overhead video projection. The program is the most capable program of its type for any system and is reasonably priced at the building license level.

LXR•Test has been successfully designed to serve as a single solution for managing the entire spectrum of problems associated with testing. I have been using various incarnations of the program for several years, and it is without a doubt the very best program of its type running on any machine and sold at any price. It is important to note that my background includes having designed and written my own mainframe package of programs to completely manage testing, but as soon as I saw *LXR•Test* running on a Mac, I new I had found the ultimate product, and gave up on my own system.

I will attempt to preview some of its features here, especially for those unable to attend the presentation, but it is impossible to accurately convey the potential of this incredible program without seeing it in action. For those of you not able to attend, the company offers a demo disk and HyperCard tutorial, as well as a complete money-back guarantee.

Here is a summary of the major functions provided by version 3.1 of the program: Excellent control of question entry and editing with full Mac interface; Full integration of graphics with text anywhere in question; Grouping of dependent questions; Flexible and fast selection of questions based on sophisticated keyword/objective criteria; Unlimited size of question bank; Automatic scoring of exams when submitted on mark sense cards like ScanTron, etc; Automatic generation of reports for students; Automatic item analysis and flagging of bad questions. There are many more sophisticated functions that simply cannot be appreciated unless seen in a live demonstration.

By the time I present this demonstration, I should have a beta test copy of version 4.0, which is expected to have a number of new advanced features. I have received permission to show this new version at the conference.

The single-copy price is steep @ $600.00 for the complete edition of version 3.1, but the multi-user license is very attractive. They offer a "building" license to academic institutions for $1500.00, and previous purchases by departments in the building apply toward that total. After a building is licensed, individuals officed in the building may get disks and manuals for $30.00 each!

-{: MACROS FOR TEACHERS :}-

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ABSTRACT

This presentation will introduce beginning and intermediate users to the labor and time saving device of macros. A demonstration of how to build and install macros on Appleworks using Autoworks will be given. Examples for teachers will include macros for letterheads, lesson plans, a progress report, instructions for exams, an overdue library book notice, a telephone message pad, etc.

INTRODUCTION

Everyone in education who uses computers--from the teacher in the pre-kindergarten class to the University Professor of History--can benefit by using "macros". The assumption is that all teachers, regardless of the level at which they teach, have many things in common: they are all burdened with too much paperwork, have too much that needs to be done and have too little time in which to do it. Macros can save many minutes a day while doing routine tasks on a computer. By the end of the school year these can total many hours.

DISCUSSION

Think of macros as "shorthand". Macros allows the comptuer user to define a combination of two keys to represent a series of keystrokes. The macro can represent up to hundreds of consecutive keystrokes. Whenever there is a series of steps that are frequently repeated by the computer user, a macro can be defined to substitute for that combination of keystrokes.

Many computer programs have the built-in ability to create macros. One example is Bank Street Writer. Other software "patches" macro capabilities to programs. For example, there are macro programs which can be added to Lotus 1-2-3 on the IBM (tm) computer, and many which can add macros to AppleWorks for the Apple (tm) computer. For this session the software discussed will be that which adds macro capabilities to AppleWorks.

A very simple illustration of the usefulness of a macro is the presenter's name and address above. If this or the name of the teacher, classroom, period, and school were repeated at the top of many reports, examinations that the teacher prepared, a macro could save quite a bit of time. This title requires at least 122 keystrokes to type the data, use option keys to center, begin bold, end bold, and end centering. By building a macro (O-A - 5), pressing the combination of the Open-Apple key and the number 5 key will thereafter type this title at the top of a page). Such a macro would look like the following:

Centered name and address:
5:~BYour name~B, Your title<~H><C>Your Department<~H><C>~BYour School~B<~H><C>Your town, Sate Zip<~H><C><RETURN>

A series of programs which can add Macros to AppleWorks will be mentioned and described: Autoworks, Macroworks, Super Macroworks, TimeOut UltraMacros, KeyPlayer, TimeOut UltraMacros, Timeout UltraMacros Macro Tools, Timeout Macrotools II.

The session will then demonstrate how to install AutoWorks on AppleWorks. It is one of the easiest to use. Moreover, all school districts cannot afford to continuously update software! Autoworks can be used with earlier versions of AppleWorks as well as version 2.0.

The remainder of the session will be devoted to demonstrating how to write a macro, and install it permanently on a Turkey file on AppleWorks.

For example, typing a subscript for H20 on your handouts or exams can be tedious. At least 11 keystrokes are needed to make the H2O look correct: Type H, then OA, then -B for subscript begin, then escape to return to document, then type 2, then OA again, then-E for subscript end, then escape, then 0.

A macro can simplify this. Define Closed Apple - ; to begin and end a subscript.

Begin and end subscript:
;:<A-O>-B<RETURN>-E<RETURN><ESC><LEFT>

Thereafter, typing H, CA-;2,right arrow,O. The 11 keystrokes has been reduced to 4 keystrokes. Other macros can reduce the work further. By the end of one typing a single page of a high school chemistry handout or exam, macros will have saved 100's of keystrokes!

Several examples of macros will be given which might be useful for teachers. They will include macros for letterheads, lesson plans, a progress report, instructions for exams, a overdue library book notice, a telephone message pad, etc.

Logo and Learning:
Can Cognitive Structures be
Enhanced by Logo Training?

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ABSTRACT:The Logo computer language was developed to help
children reach higher level thinking skills. Supporters claim
that its use may make abstract concepts more concrete for the
learner, and thus allow the learner to advance more easily to
levels of formal thought. This presentation will examine
research which explores the theoretical cognitive potential of
programming with Logo for children as they enter the age of
possible formal operational thought.

Introduction

The Logo computer programming language was originally
developed with the goal of helping children reach higher level
thinking skills. Supporters claim that its use may make abstract
concepts more concrete for the learner, and thus enhance the
learner's ability to advance to levels of formal operational
thought at an earlier age than would otherwise be possible
(Papert, 1980). Much anecdotal evidence has been collected to
support this claim, but traditional experimental research has
shown mixed results.

This presentation will examine research which explores the
theoretical cognitive potential of programming with Logo for
children as they enter the age of possible formal operational
thought. The author's research into this topic will be discussed
in detail and compared to other recent studies.

The purpose of this study was to determine the effect of
Logo training on the thinking skills of seventh grade students.
Structured programming with Logo, as with any computer language,
requires solving problems through a process of breaking the
problem at hand into smaller, more easily handled pieces. This
process requires an analysis of the problem, a plan for solving
the problem (developing the algorithm), application of
programming knowledge, and debugging skills. The process could
be described as using skills of formal thought such as
hypothesizing and self-referential thinking; using skills named
in the higher levels of Bloom's Taxonomy such as application,
analysis, and synthesis; plus skills used in creativity such as
divergent thought.

This study was planned as a means of determining if the
skills necessary for programming with Logo would transfer into
other measurable areas. Transfer of Logo programming skills to a
variety of higher order thinking skills was evaluated. The
skills investigated include the student's use of formal
operational thought as described by Piaget; higher level thinking
skills as described in Bloom's Taxonomy; and/or levels of

creative thought as described by Torrance. Strengths of the
study include length of treatment, assessment of Logo learning,
and consideration of a variety of cognitive skills. Limitations
of the study include difficulties in measuring formal thought and
the use of intact groups.

Method

This study followed a quasi-experimental pretest-posttest
design as random assignment to groups was not possible. The
experimental subjects were 25 seventh graders enrolled in two
one-seme' ·r classes (approximately 87 fifty minute periods)
devoted ·· Logo programming. Logo was taught through a project
approach which included instruction over specific Logo commands
or concepts, followed by a short structured assignment using the
commands. Students were then asked to incorporate the commands
and concepts into a theme project of their own design. Control
subjects were 30 seventh graders at a different junior high who
received no Logo instruction during the treatment period.
Measurement instruments used in the study include (1) the
Arlin Test of Formal Reasoning; (2) the Developing Cognitive
Abilities Test, and (3) the Torrance Test of Creative Thinking.
A fourth test developed by the researcher measured the level of
Logo achievement.

Results

Each of the three hypotheses was tested by analysis of
covariance, using as the covariate the pretest score on the
criterion measure for each dependent variable. However, analyses
of pretest and pre-pretest data determined that the control group
scored significantly higher than the experimental group,
indicating that the groups were nonequivalent prior to the study.
Although the experimental group increased their Logo programming
ability significantly and scored higher on posttest measures than
the control group, particularly on the test of creativity, none
of the analyses revealed a significant difference that could be
attributed to treatment with Logo training.

Conclusions

Teaching Logo programming to children is a controversial
topic at present. Supporters of Logo have conjectured that
students will be capable of viewing abstract concepts more
concretely after programming with Logo. In order for
administrators to make appropriate decisions concerning the use
of computers in schools, research such as this and other studies
must be analyzed.
The above study will be compared to a number of current
research studies on the cognitive effect of Logo training on
students in grades five through nine with an attempt made to
evaluate the value of teaching Logo in the middle and junior high
ols.

Networking: People Connecting People

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ABSTRACT: As a class assignment for a graduate level
introductory computer education class, students were required to
access a local electronic bulletin board, read and comment on a
message from the instructor concerning the topic of "Networking"
as a means of connecting people, then log on a second time to
react to the comments of their peers. The project will be
discussed in terms of the concept of networking as a connection
between people, telecommunications as a medium for networking,
and as a beginning telecommunications experience for graduate
level university students.

Introduction

Students in the introductory educational computing class at Texas
Tech University were introduced to telecommunications by first
observing the instructor log on to the information utility
Compu-Serve, then working through a telecommunications simulation
called the Information Connection, then using a local area
bulletin board to network with other members of the class.

The bulletin board is located in the computer center of the
College of Education and is serviced by a graduate student as the
system operator (SYSOP). It runs on an IBM XT with RBBS-PC
Version 13.1A as the bulletin board software. RBBS-PC is a
shareware item which sells for about $50.

The first time the students logged on to the bulletin board they
were to read a bulletin placed there by the instructor. A
summary of that message follows:

John Maisbitt, in Megatrends, (1982) outlined ten national
trends which involve change or movement within our society.
Briefly, they are as follows:

1.	Industrial Society	-------->	Information Society
2.	Forced Technology	-------->	High Tech/High Touch
3.	National Economy	-------->	World Economy
4.	Short Term	-------->	Long Term
5.	Centralization	-------->	Decentralization
6.	Institutional help	-------->	Self Help
7.	Representative Democracy	------->	Participatory Democracy
8.	Hierarchies	-------->	Networking
9.	North	-------->	South
10.	Either/Or	-------->	Multiple Options

Several of the trends seem obvious now--just a few years after publication of Megatrends. The transition from an

industrial society to an information society is commonly acknowledged as is the movement from North to South.

The message then goes on to examine those trends mentioned by Naisbitt which are impacted within education by telecommunications and discuss how telecommunications, by means of an electronic bulletin board, can provide a media for networking both among local educators and/or across geographical barriers.

The trend listed as eighth refers to the movement from hierarchies to networks in business communications. Networking is people communicating--sharing ideas, information, and resources whether in business or education. Networking via computer is quick, it is high tech and high touch, and it is energy efficient. Networking provides horizontal linkages for connections among peers.

Students in any class form a network of sorts, at least for the duration of the class. All members have expertise in one area or another which can be shared. Students in this class now have a specific medium within which to network and share their ideas.

In order to computerize the network in this class, students were to log on to the bulletin board once to read the above message, and a second time to "network" with their peers about the message. Both semesters this exercise has been tried, bugs in the bulletin board software have caused the students unnecessary difficulty. However, student discussions of the process and actual networking were very positive. Most students have responded with thoughtful comments to the bulletin board message and to each other. We also got a few entries into the network from people outside the class who read the students comments and responded to them. Students in one class suggested that the exercise be done early in the semester the next time the class is taught, in order that the students could have that medium for networking all semester. Although the software problems were frustrating to deal with, it has been a positive introduction to telecommunications for most. We are hoping that updating the software will solve the frustrations and make the experience on networking via computer a positive one for all.

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IMPLEMENTING K-5 COMPUTER INSTRUCTION

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Participants will learn about Northside ISD's implementation of K-5 computer lab instruction. The curriculum is built around keyboarding, word processing and problem solving strands. Information on software selection, lesson planning, the development of a learner based scope and sequence of skills, and staff training ideas will be presented.

Northside Texas' eighth largest and fastest growing public school system with an enrollment of approximately 48,500 students, has been successfully implementing district-wide elementary computer lab instruction for the past three years. Since student time spent in the elementary computer labs is at a premium, we have limited what we attempt to teach in this setting to truly have a positive impact on education. We have selected software at each grade level to teach keyboarding, word processing to enhance the writing process and LOGO to assist students with their problem solving abilities.

The Northside elementary computer program is for all students, not only special populations of youngsters. The use of computers by students in Northside schools is more than just a reward for good behavior, work well done or another activity for a child who finishes his/her other assignments first. It is a regularly scheduled class for all students in grades K-5 with specific software, a curriculum, scope and sequence of objectives, lesson plans and expected learner outcomes.

Lesson plans/curriculum guides have been developed for each grade level. Teacher workshops on the use of the Northside curriculum guides and computer courseware are ongoing for classroom teachers and special training has been designed for the computer lab instructors. Additionally, we have produced an implementation handbook, trained principals, campus lead teachers and grade level key teachers, arranged software licensing agreements, developed computer clubs, instituted in-house hardware maintenance and established guidelines for staff use/check-out of the equipment and courseware during holidays and vacations.

In order to address the use of computers in various content areas (ie. reading, math, science, social studies, etc.) we have begun to place computers-on-wheels on several campuses for teachers to borrow and integrate into all classroom instruction. Once again, appropriate software has been evaluated and selected for this program and is being correlated back to the NISD curriculum guides in each subject.

The computers in Northside also benefit teachers by helping them to reduce their paperwork (ie. electronic gradebooks, word processing of documents and letters, test and worksheet generation, crossword puzzle and word search generation, etc.). The microcomputer has truly given our teachers the opportunity to enhance and individualize student instruction.

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RE-INKING A FABRIC RIBBON

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WHY RE-INK? Cut the cost of ribbons. Produce crisp, high quality, legible reports each time. Extended printhead life.

RE-INKING a nylon ribbon and the correct dot matrix ink can increase the life of the ribbon and the life of the print-head. A ribbon that is well inked and lubricated will increase the print-head life if, along with a inked and well- lubricated ribbon, the printer is cleaned regularly to remove the accumulation of paper dust and other dust that can collect inside the printer.

Though research has been made on the subject of re-inking, little has been published. Data regarding ribbon and the effect of re-inking were obtained from Don H. White, Ph.D., professor of Chemical Engineering at the University of Arizona, and a paper written by Jimmie A. Moglia.

Mr. Moglia states "To increase the resistance to wear of the ribbon and to maintain good character definition with high speed printers it has been necessary to increase the density of the ribbons...High density ribbons have less ablity to store ink (i.e. they dry sooner) but they do not tear (i.e. they last longer)."

Quoting from Prof. White. "The friction coefficient between the matrix needles and the ribbon is very important. The ribbon starts to wear out once the filaments begin to dry out. The ink plays a key lubrication role along the impact surface, prevents any adhesion between hot needles and fibers and also significantly reduces wear".

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The temperature at the impact point is a key factor in the wear of the ribbon. A large share of the strike energy is transformed into heat and the ribbon (nylon) are very sensitive to an increased in temperature. The printer-head may become quite warm after a working day. The repetitive impact on the needles can result in needle temperature rising close to the melting point of nylon causing a softening of the fabric under the needles' strike. Once the ribbon gets dry, the impact temperature rises sharply causing rapid degradation of the fabric.

Here is one good reason to re-ink. Extend ribbon life by reduction of the adhesion between needles and nylon.

Much damage can be done to a print-head by using clay-based ink (i.e. the normal ink stocked at stationary stories). The ink solids will gum up the cylinders through which the needles travel. Without lubricant the ink does not provide cooling.

In conclusion, a ribbon regularly re-inked with dot-matrix ink will provide cooling and lubrication to the print-head. The ink will also keep the ribbon fabric supple, thus extending the life of the ribbon. Ribbons (20 yards) can be re-inked safely between 60 & 100 times. They do have to be replaced. Ribbons should be set aside for a short time (1 or 2 weeks) before use to allow the ink to spread evenly across the width of the fabric.

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DEAF EQUALITY THROUGH
TELECOMMUNICATIONS

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Deaf students in El Paso's Regional Day School for the Deaf are now able to send messages, receive information and communicate with anyone, using a computer and a modem.

Telecommunications is tailor-made to meet the needs of the deaf. For the first time in El Paso's history, a deaf person can interact at exactly the same level of communication as his hearing peers. In truth, telecommunications is the technological barrier breaker that has permitted "mainstreaming" to come to all segments of Special Education. In our school, it means "mainstreaming" ALL deaf students.

What is "Telecommunications"? Telecommunications is using a computer, interfaced with a modem and connected to a phone line to communicate. With telecommunications you may chat, send and retrieve messages, search for information, read bulletins, up load or down load files and find help on other academic and non academic subjects.

A computer is interfaced with a modem and a phone line when it is properly connected so that the three complete and separate electronic parts work together as one. This connection is analogous to a car hooked to a trailer and working together to accomplish one goal.

A modem is an electronic device that works partially like a TDD. That is, it sends and receives electronic signals via a telephone line. It is different from a TDD because it uses a different code to transmit data, it operates much faster than a TDD and it does not need to have an acoustical coupler or other special connectors. It works with the phone line rather than the actual telephone receiver.

The computer uses a standard keyboard and monitor. The modem uses the ASCII code to transmit a retrievable message. This is important to the deaf because it eliminates blinking lights, busy signals, and the necessary presence of the other party when sending electronic mail. The modem can "pick up" the phone line, receive a dial tone and dial a desired number without ever touching a regular telephone receiver. For the deaf, this means there is no need to hear the dial tone, the click of line connections or the ringing or pickup at the other end. Messages may be stored on disk. They may be printed to paper at the time they are received or later as the user desires.

Just as learning to read, learning sign language, learning to type, or learning to drive a car; learning "how" to use this "high tech" communication is necessary. Consequently, we at the Regional Day School for the Deaf in El Paso, Texas, are teaching deaf students and teachers of deaf students how to "telecommunicate". Working with the *Pinpoint Publishing Co.,* and Ken Blystone's local BBS *(The Academy),* we are piloting a program to teach the deaf students on our three campuses how to talk to each other over phone lines. The students are learning to send messages. They are communicating with hearing teachers and other hearing students in all parts of El Paso and across the border in Juarez, Mexico.

The computer and the modem are the new tools which place deaf students near total equality to their hearing peers. This combination of electronic tools permit the deaf to communicate without prejudice. Telecommunications places hearing and non-hearing computer users on the same plateau because both are able to talk with each other anywhere; without sign, sound, or interpreter. In truth, we are talking not only about equality in education but the miracles in technology when the deaf hear and the mute are heard across the state and nation.

This is an almost unheard of occurrence. Can you imagine a deaf student communicating with a hearing student over a phone line? We are doing it and it is possible but only with modern telecommunications equipment.

Thanks to the *Pinpoint Publishing Company,* we have modems from *Prometheus, Apple II computers* and the necessary Point to Point software in our computer classrooms. We also have two computers connected to modems which selected students keep and use in their homes for a couple of weeks. The equipment then rotates to another two students.

THE DYNAMITE DUC —
COMPUTER + LASERDISCS

Ellen Joslin
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At McCulloch Middle School in Highland Park, we have incorporated laserdisc usage into our science curriculum. In this session, I will compare and contrast the different ways we use computers to control laserdisc players. There will be a discussion of how our teachers use laserdiscs and our students respond to using laserdiscs.

****

Imagine a classroom where you and your students have the ability to search through a visual database within seconds. We have such classrooms at McCulloch Middle School in Highland Park. Our science teachers have become addicted to the use of computer controlled laserdiscs.

Our teachers are very creative in the ways in which they use this new tool. It is being used in direct instruction to provide clear demonstration of otherwise difficult to communicate concepts. Boys and girls watch, open eyed, as cells divide. The laserdisc film clip can be paused, allowing the instructor an opportunity to emphasize specific items of information. Sequences can be easily revisited; details missed the first time can be stressed the second time. Lead-in material and follow-up material is easily accessed.

Each videodisc contains thousands of photographs, diagrams, and text frames, plus dozens of narrated movie clips. From this wealth of material the teacher chooses those items which best suit her/his lesson plan. For years, teachers have expressed concern that technology will replace the teacher. Such is not the case with computers, and such is not the case with laserdiscs. The new technology is giving teachers an enhanced ability to do what teachers have always done. Good teachers organize a body of knowledge in such as way as to make the subject learnable; a good teacher knows her students as well as her subject matter. The multitude of choices offered by laserdisc technology allows a caring and creative teacher to tailor instruction as she was never before able to do.

Laserdiscs are used to test students. Where in the past we have expected students to study and evaluate slides under a microscope, we now project the same slide onto a large screen. Our science exams have always contained a visual element; now we are sure that everyone see exactly the same visual.

Previously programmed computer-laserdisc lessons are allowing students to play catchup. The boy, who was absent, or the girl, who did not understand the first time presentation, can work with the computer laserdisc combination on an individualized basis.

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Our experience has been that this technology increases student motivation and performance. The science teachers, who vie for use of our two laserdisc players, tell me that laserdisc usage increases teacher effectiveness. Our sixth grade studies a unit on Weather. I recall one dark day when Dallas was under a tornado watch. The science teacher accessed the laserdisc material on Tornados to teach a lesson that our children will not soon forget. They learned the hows and whys of tornados in context with a film clip which clearly showed a tornado and the devastation it left in its path. The combination of an easily accessed archive of films about storms and a creative teacher is unbeatable.

Laserdics have been used at McCulloch for two years. Our introduction to the technology was courtesy of TCEA; we first saw it at a TCEA conference. The McCulloch PTA is wonderful; these forward looking ladies have financed our use of laserdisc technology.

The first year we used a Pinoeer LD 700 with an Apple IIe computer. We tried controlling the laserplayer in a variety of ways. The simplest way was with the infrared remote. This technique is useful in surveying the disc; teachers use the remote when they are preparing their demonstrations. When they are "walking and talking" in the classroom, there is no time to key in five digit frame numbers. With the LD 700, teachers found the most effective usage of the laserdisc involved using a computer driven preprogrammed list of the frames and film clips. As the teacher prepares her lectures, the instructor makes a list of the laserdisc material which he/she might want to include. We use the Optical Data discs which come with complete and comprehensive image directories plus a transcript of every narrated movie clip. An easily accessed data base is typed into the computer using the public domain program, FREDwriter. In the database titled "Cell Division", the teacher may list twenty frames and two film clips. The five digit numbers which access these frames and films are recorded on a floppy disk. When the teacher uses this material, she presses the 1 on a number pad to show the first frame, 2 to show the second frame, etc.. Computer control offers two advantages, error-free manipulation of the laserdisc player and database management of the laserdisc's contents.

We received our second laserdisc player, a Pioneer LD-V4200 in late fall. We are using this with an Apple IIe and with a Macintosh SE. Interactive videodisc technology continues to evolve; both users and developers are becoming more sophisticated. We are excited about the use of Hypercard databases to control the computer. The teacher can put lecture notes on the Hypercards, which show on the computer monitor, and use the monitor like a teleprompter while having the computer call up appropriate corresponding audiovisual material. Students can work individually using a Hypercard stacks to control laserdisc output. It's a wonderful combination.

Videodiscs allow teachers to move beyond familiar classroom activities and into a vast library of images and sounds. The teachers who incorporate laserdisc technology in their teaching are finding the combination of computers and laserdiscs a dynamic duo!

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THE PREVIEW CENTER: A METHOD OF TEACHER TRAINING

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The Preview Center is a teacher training and student evaluation program sponsored by E.S.C. Region XIII. Today's presentation focuses on one session fo the teacher training component. Topics covered in this session include installation and use of Echo Speech Synthesizer, use of the Power Pad, Porter and switch interface and software review. Other sessions cover topics such as the Adaptive Firmware Card, Communication devices and environmental controls.

The Preview Center is a method of computer training that is designed to be as non-threatening as possible. It is a blend of very simple computer terminology, creative problem solving and hands-on training. The number of participants is limited to four per trainer at each session.

The beginning of the workshop discusses hardware, firmware, and software. The computer is an example of hardware, the Echo Speech Synthesizer is an example of firmware and of course a floppy disk is an example of software. The next step is to look at the inside of the computer. The motherboard, the slots and their various functions are pointed out and discussed.

Three additions to the computer are highly recommended. They are the Echo Speech Synthesizer, which allows the computer to speak, a moisture guard (clear pliable plastic cover for the keyboard) that protects the computer from liquid and sticky fingers, and a keyguard that allows a student to stabilize his/her hand without touching the keys. The keyguard can also be adapted with plastic marker caps to allow for an alternate imput method at no cost.

Every participant then installs an Echo Speech Synthesizer. Several communication programs are demonstrated from the disc that comes with the Echo. There are several easy to use programs on this disc that seldom get used because most people don't know they are there.

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Selection of software is a very important factor. There are three major categories of software discussed; Public Domain, which is free and can be copied, inexpensive software, and expensive software. Examples of each are looked at and discussed. Educators need to be aware of what to look for and also have an idea of what can be expected. There are some very useful free and very inexpensive programs available if you know where to look.

The two alternate methods of input that are primarily discussed are the Power Pad and single switch access via a Porter and a switch interface. The Power Pad is a large touchpad that is fairly sensitive. A variety of communication and simple educational programs are available for it. Many of the programs available for the Power Pad come with their own overlays but it is very easy to make your own customized versions. A single switch allows a student to access a computer with whatever body part he/she best controls. The software demonstrated for this purpose is very simple. Switch access involves a learning process for many of the students that require this method.

This workshop demonstrates to people how easy it is to get started using a computer. It is a gradual process, you can't learn everything in one workshop but you can learn enough to get started with your students the very next day. Technology is changing classrooms and more importantly student's lives. Educators need to be aware of the changes that are possible via technology. Hopefully, this workshop provides an introduction to those technological changes.

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Yes, Virginia, You CAN Teach Kids How to Think!

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This workshop will put you in the student's seat for a lesson in problem-solving. The instructor will demonstrate the preactivities, actual lesson, and post-activities to be used in the classroom to impart problem-solving skills to your students.

PRE-ACTIVITES: Day 1

OBJECTIVE: Use logic and deduction skills to identify missing answers.

HINTS: Decide on way to pair kids before class.

PREPARATION: Make a transparancy of and Xerox gamesheets, cut six colors of paper into one inch squares - enough for twenty of each color and put one set of twenty of each of the six colors into envelopes for storage.

FOCUS: If you have a drawer full of black and blue socks, and the room is dark, how few socks would you have to take with you to the bathroom to guarantee a pair?(3)

ACTIVITY: Explain game feedback thoroughly before you begin. (for right color, right place; X for right color, wrong place; no mark for wrong color, wrong place) Then demonstrate game on overhead using only two colors, no duplications, and two unknowns. Have students guess anything to start. Then give feedback and explain what they know from the feedback. Once they've ~otten the first one, expand to three colors, no duplications, and three   owns. Again, start with any guess. Give and explain feedback. Have students make next guess, explaining to you and the class the logic for their guesses. Do two or three with three unknowns, ending with one duplication. Then increase to four unknowns, with no duplications. Throughout, have students explain and discuss all guesses and their logic.
    Then pass out game boards and envelopes with colored squares. Have students alternate as challengers. The guesser should explain all reasons for guesses and the challenger should write all feedback on another paper, NOT on the game board.

CHECK FOR UNDERSTANDING: Monitor students responses.

RETEACHING ACTIVITY: If required, go back to two colors and redemonstrate step by step for students who are lost. Have students explain their logic and steps taken in mind to reach solution.

CLOSURE: Discuss strategies to cut number guesses down.

SOFTWARE ACTIVITY: Day 2

OBJECTIVE: Analyze clues, make inferences, detect patterns, experiment with solutions, and draw logical conclusions.

HINTS: Encourage kids. Have some kind of treat or reward to give for each one they solve.(stamps, stickers, stars)

PREPARATION: Go through program yourself until you have figured out the strategies.

FOCUS: Play game on transparancy again, using four unknowns, four colors, and a duplication of color. .

ACTIVITY: Using only one computer, demonstrate software and have kids explain logic in their responses to feedback. (Ask - "What are you basing this guess on? What do you know about each unknown? How many agree? Disagree? Why?)

CHECK FOR UNDERSTANDING: Monitor feedback. Ask questions to encourage rethinking.

ALTERNATIVE ACTIVITY: Have kids work alone or in pairs and play on their own computers, explaining all moves to partners if in pairs.

CHECK FOR UNDERSTANDING: Have kids keep a record and chart guesses per challenge. Give rewards for any demonstration of improvement.

CLOSURE: Debrief students on HOW they solved these problems and how these skills could be used in the work place.

POST ACTIVITES

OBJECTIVE: Transfer skills used in game and software into real life situation.

HINTS: Your district or city should have a speakers bureau to use as a resource for guest speakers. Some suggested careers to draw from include Medical Lab Technicians, Histopathologists, Medical Examiners, Homicide Detectives, Arson Investigators, Archeologists, Paleontologists, Astronomers, Coaches, Building Inspectors, Insurance Investigators, and/or FBI Agents.

PREPARATION: Discuss problem solving with speaker to correlate the purpose of their visit to your objectives.

FOCUS: Introduction of speaker(s).

ACTIVITY: Have guest(s) speak on the problem solving techniques used in their profession.

CHECK FOR UNDERSTANDING: Question and answer period.

RETEACHING ACTIVITY. Have kids interview people on their own to find how they use these problem solving skills.

CHECK FOR UNDERSTANDING: Oral Reports. (Can be used as Unit Evaluation)

CLOSURE: Debrief problem solving techniques shared.

EXTENSION ACTIVITY: Play Clue, Master Mind, or Deluxe Master Mind in a contest-type competition. Offer prizes for quickest solutions.

CIRCLE CENTERS
Computers Integrating Reading Composition Language and Esteem

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At Frazier Elementary School in Cypress Fairbanks I.S.D. a 1st and 2nd grade language arts curriculum has been implemented through the extensive use of computer technology. The curriculum consists of activities organized through thematic units of study. Computers provide opportunity for young students to improve phonetic skills and to write stories. Preliminary achievement data indicates that this integrated language arts approach is successful with young students.

Due to an increasing demand for accountability curriculum has been broken down into small units of subskills that can be easily tested. In recent years these basic tests have influenced educators to design strategies to teach and drill each subskill. Such strategies have resulted in a fragmentation of curriculum.

In an effort to create a curriculum that allowed the co-mingling of reading and writing, Frazier Elementary School personnel designed a pilot study. The major elements of the curriculum included a whole language approach to the teaching of reading and writing with an emphasis placed on the use of computers to assist children in the writing process.

The original pilot project produced data that indicated this was a viable approach to teaching young children. In addition to improved achievement in reading and writing the students' attitude was notably positive. Students enjoyed coming to class and were always involved and on task. Teachers indicated that the students who used computers were more relaxed and became independent learners.

The project has been expanded to include three-hundred and seventy-nine first and second grade students. Achievement data continues to indicate improved scores in reading and writing.

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CIRCULATION PLUS: HEAVEN OR HEADACHE?

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This presentation will provide an objective look at Follett Software Company's Circulation Plus, a popular circulation system in many school libraries. Suggestions for implementing the program in a new or existing library will be shared. The program will also address problems encountered by users, and possible solutions for these problems will be discussed.

Langham Creek High School Library was the first Cypress-Fairbanks Independent School District library to implement Follett Software Company's Circulation Plus in 1985. Because it was a new school, Langham Creek library staff had the advantage of processing its very first book "automation-ready." By the time the library doors opened for the first time, all student data was entered into the computer and each book barcoded and keyed into the system. All of this student and book information was typed manually into the computer by one of the library para-professions. Since that time, book companies have begun to provide barcoding of books as well as book information on software to load into Circ Plus. This service, provided by Brodart, Baker & Taylor, Follett, Bound to Stay Bound, Econoclad, and other companies has made inputting necessary information less time-consuming and troublesome.

With the exception of one junior high staff, all other secondary librarians in Cy-Fair have been faced with the task of automating circulation of existing collections. Although many companies now provide retrospective conversion of shelf lists, the cost of converting collections of three high schools and five junior highs was too high for consideration. The library staff of Cypress Creek High School developed a step-by-step procedure for preparing the shelf list and collection, and this suggestion list has proven to be a helpful tool for the other librarians in the district. Items included for consideration are weeding before automating, checking for a well-organized shelflist with Library of Congress numbers where available, determining barcode placement on book and placement of barcode number on shelflist card, as well as priority scheduling of sections of the library collection. Many of our librarians have trained

volunteers to do barcoding and even inputting of information. Once all book information and student data is in the system, the librarians can begin to reap the benefits of their labors and drop the manual circulation system. The "heavenly" aspects of Circulation Plus then become evident to the user: the clean screen, ease of checking books out and in, ability to figure fines automatically or charge no fines at all, the reserve feature, the quick access to circulation records and various lists, and time-saving overdue notices.

Our library personnel have encountered some problems with Circulation Plus software and our IBM-compatible hardware. A dedicated power line in some schools has alleviated some of the hardware problems. Subscription to the technical services that Follett provides is a must in handling software problems, especially those involved with updating to enhanced versions. The librarians in our school district have benefited from each other's experiences and have organized a network to make our new users' automation steps less painful. The greatest lesson learned is that an increased knowledge of computers in general, patience, and a positive outlook can ease the "headaches" of working with Circ Plus or any other library automation system.

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Practice What You Teach

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Ideas and issues related to teaching students how to ethically deal with technology and computers.

Today's technology makes it easy to produce and reproduce materials to use in the classroom. Most teachers are very liberal in their interpretation of the copyright laws, and are unintentionally reinforcing unethical and illegal activities.

As role models, we as educators need to ab'de by the letter and the intent of copyright laws.

Ethics should not be a separate 'unit' of instruction, but should be integrated into the entire curriculum. Computer literacy teachers are in a unique position of leadership in setting an example for their students and staff. By demonstrating a firm understanding of, and adhering to copyri_,t law, a teacher can influence the behavior of others.

A copyright is a statement of ownership of the work of a person or company. Written permission is required if any copying of such material is made. Are there situational exemptions? What is 'fair use'? Are freeware and shareware copyrighted? When can copies be made? Are programs public domain if they can be easily copied? What can I do with my backup copies?

Teachers are not exempt from the laws regarding copyrights. We should be sure to follow the copyright laws and set the proper example for our students. We should practice what we teach!

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The TCEA State-Wide Programming Contest: Organization and Analysis of Results

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This paper describes the state-wide high school programming contest sponsored by the Texas Computer Education Association (TCEA) in April of 1987. The following sections contain a description of the contest format, an after-the-fact analysis of the problem set, and an explanation of successful team strategies.

I. Introduction

Thirty-one teams from across Texas participated in the Fourth Annual TCEA State-Wide Computer Programming Competition. These teams had earned the right to compete at the state event through area level performances. Area contests were conducted in February, 1987, within each of the six TCEA geographic regions as a mea 1s of selecting representatives to the state contest. More than 900 students from public and private high schools competed on 246 teams for the chance to advance to the final competition.

II. Contest Format

The contest was held in the cafetorium at Judson High School near San Antonio. The programming portion of the contest was two hours long, preceded by a fifteen minute practice session. A one hour break after the contest allowed compilation and verification of results and lunch, before awards.

Each team of four sat at a table together with a microcomputer and printer supplied by the team. Operating system and programming language were also the responsibility of the team. Members stayed at their assigned table throughout the contest while volunteer runners carried listings of code and print-outs of solutions between the teams and the judging station. Two clerks handled submission of problem solutions and return of scored problems to teams. A Head Judge and five specialized problem area judges tested each submission against two sets of previously agreed upon test data; 284 submissions were scored in 130 minutes, with judging completed approximately 10 minutes after the competition ended.

III. Problem Set Description

Eighteen programming problems prepared by the Contest Director and reviewed by the judges prior to the day of the meet provided the basis for appraising the teams' programming skills. Problems were evenly divided into three categories of low, medium and high difficulty. The low difficulty problems were valued at two points each, the medium difficulty problems at five points each, and the high difficulty problems at nine points each. Problems represented a rich sampling of programming applications. The complete problem set and more detailed analysis and discussion are available from Don Knezek, 13 Augusta Drive, Wimberley, Texas 78676.

IV. Item Analysis

Two kinds of evaluation indices were computed from the ranking of team scores and the problems worked by each team. The first was an adjusted difficulty index, indicating how easy or hard the teams in general found an individual problem. The second measure was a discrimination index, pointing out how well each problem separated the top eight teams from the bottom eight teams in the contest.

The difficulty index for each item was first computed in the traditional manner (Thorndike & Hagen 1969). That is, we calculated the percent of the total number of teams who answered each item correctly. However, this index was biased because some of the problems were valued at two points while others were valued at five and still others were valued at nine. Therefore, we next adjusted the index for each problem by dividing the traditional difficulty index for each problem by its point value. This allowed us to rank the difficulty of the items relative to their point values.

The discrimination index was computed in a standard fashion (Thorndike & Hagen 1969). That is , the teams were first divided into top, middle and bottom groups in a manner such that the top and bottom groups each contained roughly 25% of the total number of teams. Next, the proportions of teams who answered a problem correctly were tallied for the top and bottom groups on each item. Finally, the proportion who scored correctly in the bottom group was subtracted from the proportion who scored correctly in the top group to yield a discrimination index. Discrimination indices ranged from a high of .88 to a low of - .13, where a higher positive number (closer to 1.0) indicates better discrimination, a zero value indicates a problem has no ability to distinguish between the top and bottom groups, and a negative value means that the problem tends to raise the scores of the lower group while reducing the scores of the upper group.

These indices plus the pattern of problems solved by teams in each group indicate that the problems were generally well suited for separating the teams. There is a large spread in the adjusted difficulty index, showing that there were indeed some easy problems for the less advanced teams as well as several difficult problems to distinguish among the top teams. This was intended by the author of the set. The problem set was not perfect, however, and specific suggestions based upon the analysis were made.

V. Successful Team Strategies
Several strategies emerged among the top teams based upon data analysis and observation of the contest. First, all teams who succeeded in advancing to the state contest divided the duties among their team members. One person was a keyboarder while three team members were problem solvers.

A discriminant function analysis (SPSS, 1986) using score distributions to predict membership in top, middle, or bottom group pointed out other interesting tendencies. When several variables were included in the analysis, only the total number of items answered correctly and the number of attempts at two point problems were needed to classify a team into the top, middle, or bottom group with 96% accuracy. A more detailed study of the discriminant coefficients showed that teams who dedicated significant efforts to working two point problems seldom achieved high total scores.

A subsequent discriminant function analysis after removing total number of problems correct, showed a secondary effect that seems obvious in retrospect. That is, the number of nine point problems answered correctly was the most important factor separating the top and bottom groups while the number of five point problems answered correctly was the next most important in separating the groups. As expected, the number of two point problems answered correctly was of lesser importance in separating the top from the bottom groups. This implies that teams who think they have a chance of winning this type of contest should focus their efforts on high point problems and fill in low value problems as time permits.

IV. Discussion
Several issues remain regarding possible improvements for future contests. The practice of asking teams to bring their own microcomputer systems continues to cause logistic problems not only in setup and disassembly but also in the scoring of solutions submitted from different machines. The question of the proper team size is one that has been debated for several years. Team size has been lowered from four members to three members beginning in 1989. The difficulty of writing problem sets at appropriate levels but with new material for each contest will continue to become a more serious problem each year.

The issue of whether a contest should be judged solely based upon correct output and not upon the quality of the code or the means of achieving the solution is also significant. This last issue is being addressed by a number of groups who are currently organizing contests based not only upon correctness of solution, but also programming efficiency and style.

Still, if results are to be available within a reasonable timespan after the completion of the contest, there appears to be little room for improvement in the current method of judging. The 1987 judging team scored an average of 2 . 2 programs per minute and finished shortly after the contest ended. Judging based upon programming style and algorithmic method would have taken hours, or days, to complete.

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Fixed vs Mobile Labs vs Classroom Use of Computers
at the Elementary Level

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The success of an elementary computing program often depends on the location of the hardware and the software. There are certain factors that a school district should look at before making a decision such as how you are going to use computers and what software you will use; facilities available and the security of those facilities; personnel and their level of expertise; and cost factors. There are advantages and disadvantages to using a fixed lab, a mobile lab, or classroom use of computers. However, each of these choices can be successful.

There are three computer locations used in most schools: the individual classroom, a mobile laboratory, and a fixed lab. Each of these have certain advantages and disadvantages. Before a school decides which location to use there are factors that should be considered and each of these factors have advantages and disadvantages as well.

One of the first things a school should do is assess its instructional goals and how the use of computers will support these goals. Then, factors such as accessibility, use patterns, personnel, security, and cost factors should be considered. Once a decision is made a plan of action for the implementation of the use of computers into the instructional program and organization of the hardware and software should be developed.

Let's look at each of the three locations:

INDIVIDUAL CLASSROOM

Use Patterns - Encourages integration of computers into the existing curriculum. However, it may allow for "dust gathering" and non-use.

Accessibility - Provides on the spot demand and is a natural part of the classroom environment (just like the overhead projector, record player, etc.). The computer is readily available to the teacher to integrate into classroom instruction. Requires organization and a management plan for scheduling equitable use by the students.

Personnel Considerations - Requires extensive teacher training. However, the classroom teacher has expertise in the different content areas. Each teacher will need training in operating the computer and evaluating and selecting software. At the elementary level where teachers teach multiple subjects this is particularly difficult.

Cost Factors - Increases the potential need for multiple copies of software and equipment needs for implementation. This location has the least efficient use of computers. The computers often sit idle for a substantial portion of the day. The use of a projection monitor for large groups (with an overhead projector) could improve utilization.

Security - Provides the same degree of security available within the building.

MOBILE LABORATORY

Use Patterns Allows for large groups in total class setting. Requires careful scheduling. Provides for large quantities of equipment for individual classrooms. Encourages integration into existing curriculum. Requires systematic method for moving equipment. Requires someone be assigned to move equipment. This leads to damage to the equipment. If students are allowed to move the equipment, they must be trained.

Accessibility - Allows large quantities of hardware to be placed in the classroom where it is needed. Restrictive because no single teacher or student can use the equipment "on demand".

Personnel Considerations - provides expertise in dealing with content areas. Requires staffing for equipment and for transportation. Requires extensive teacher training on use of hardware and software.

Security - Requires highly secure storage location.

Cost Factors - Increases likelihood for equipment repair costs and down time from moving the equipment around the building. Requires rolling carts and a method to secure equipment.

FIXED LABORATORY

Use Patterns - Provides better utilization of the lab. Allows for large groups in a total class setting. Encourages careful scheduling and a commitment to the use of computers. Restricts degree of flexibility. Restricts mobility.

Personnel Considerations - Requires staffing for hardware and software use. Ideally you would have trained personnel to schedule the use of the lab and to assist the students and teachers with the hardware and software. May be understaffed. Should be integrated into the instructional program.

Security - Provides highly secure utilization location. Provides highly secure storage location. Provides for permanently affixed equipment.

Cost Factors - Allows for networking system. Sometimes duplicate software is not required.

ORGANIZATION AND MANAGEMENT HINTS:

* Software storage and organization (color coding by grade level, separated by subject and numbered).
* Teacher Form and checkout sheet.
* Computers and peripherals labeled 1,2,3, in order to turn; color coded and labeled by name.
* Steps to load software posted.
* Software Care Rules posted.
* Troubleshooting steps posted.
* Fixed lab - Decide how students will get to and from lab.
* Mobile lab - Decide how equipment will get to and from the classroom.
* Get to know what software is available in lab or in the classroom.
* Have a campus and a district catalog of software.
* Develop a filing system for software and teach students how to use it. Students should be responsible for refiling their software.
* Teach students how to load software; how to turn computer/monitor off; how to warm boot.
* Assign students to specific computers if possible.
* Classroom use - have a rotating schedule for students.
* Picture of keyboard posted with color coding for a warm boot and for stopping the disk drive from\ searching.

Teaching and Learning with Computers (TLC): IBM's Reading/Language Arts Program for Elementary Grades

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Teaching and Learning with Computers (TLC) is an instructional system which integrates curriculum content and computer software. It also provides a classroom management structure in which teachers use current computer technology to teach basic reading and writing skills. TLC fosters a learning system approach, in which students move in small groups from station to station, while the teacher conducts small group instruction. Teachers also use TLC lesson plans that include pre-activities, computer courseware lessons, and post activities.

TLC is an instructional model that allows schools to integrate reading comprehension, process writing, language arts, and computer technology into the classroom. Since reading comprehension and process writing are issues of national concern to educators, IBM has responded with the development of the TLC model.

The overall goals of TLC are to increase comprehension, enhance vocabulary development, improve writing skills, develop research skills, and enhance listening and speaking skills. In addition to achieving these goals, students benefit in other ways. They increase their knowledge of associated subjects, such as science and social studies, and by using computers and computer technology, they become more computer literate. Students also develop self-management skills by becoming more responsible for their own learning.

In TLC, students complete specific tasks at various classroom locations, which are designated as stations. The Background Experience Station allows students to develop prior knowledge and background to prepare them for computer assignments. This station introduces vocabulary, main ideas, and characters which will be used in the courseware. At the Computer Station, students use IBM courseware for specific skill development in reading and language arts. It is composed of several computers, which are usually networked. The Writing Station provides students with the opportunity to develop writing ideas and organize their thoughts using paper and pencil. At the Word Processing Station, students use the Primary Editor Plus or Primary Editor programs to refine their writing and editing skills. They are able to compose, revise, edit, and obtain printouts of their work. They can later bind their writing pieces into books for other students to read and enjoy. At the Skills Station, students complete a variety of manipulative activities designed to increase their skill levels in reading and writing. Finally, the Listening/Book Browsing Station allows students to become more familiar with the topic and various forms of literature. Students read a variety of materials, including books, magazines, and newspapers.

The TLC approach allows for growth in reading comprehension through three stages of development: the previewing stage, the interacting stage, and the synthesizing stage. During the previewing stage (Background Experience Station), students are provided with an opportunity to develop vocabulary and explore background information. The purpose for reading the computer story is set at this time. During the interacting stage (Computer Station), students have the opportunity to read stories and answer questions on the computer. They interact with the text and develop higher-level thinking skills by answering literal and inferential questions. The synthesizing stage consists of class discussion of the story and information discovered. Students should be able to relate what they have learned during the previous stages to information discussed during the synthesizing stage. Additional reading and language arts objectives are addressed at the Skills and Listening/ Book Browsing Stations. For example, the Skills Station provides practice in skills such as word attack and decoding, while the Listening/Book Browsing Station develops listening skills and an appreciation for reading.

Although sometimes worded differently, a systematic approach to the teaching of the writing process generally includes: a pre-writing stage, a composing stage, a revising stage, an editing stage, and a publishing stage. TLC provides for growth in the writing process through the five stages of development. The pre-writing stage (Writing Station) provides time for students to generate ideas and gather information that they will use to write their story. The composing stage (Word Processing Station) provides an opportunity for students to type their ideas using the computer. During this stage, students organize ideas and background information to compose and print a first draft. The revising stage (Writing Station) provides time to reread, reflect on, and revise the written work. At this stage, students may receive feedback from their peers and/or the teacher, reorganize information, and clarify details. The editing stage (Word Processing Station) provides students the opportunity to type their changes and check for errors before printing a final copy. The publishing stage (Word Processing Station) allows students to print a final copy of their written work from the computer.

By integrating the reading and writing process with computer technology, therefore, TLC provides a comprehensive, modern teaching system for elementary students. It has been extensively field tested across the country in grades 2-5, and teachers report not only an increase in their students' reading and writing skills, but an increase in students' motivation and desire to carry a writing project through to its conclusion. TLC works!

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LOGO LEARNING: WHAT DOES LOGO TEACH CHILDREN?

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There is a small but growing base of research on what Logo does or does not teach our children. The research has been inconclusive. Clements and Gullo (1984) suggest that "Most of this work has, of necessity, been exploratory in nature." Since Logo is fairly new to education, researchers have not had time to design experiments, carry them out, and publish the results. However, there is a growing concern among educators and adminstrators that the time spent learning Logo may not actually affect children's cognitive ablities as Seymour Papert claims in Mindstorms.

There are currently over a million computers in today's schools, and this number continues to increase rapidly. Computers and peripherials are expensive. So is teacher training and software. However, the most precious commodity of all is time, time that the children spend in school, specifically the time the children spend on the computers. Therefore, that time must be spent in the way most beneficial for those students. Is Logo the best way?

When Logo was first introduced to the microcomputer, many enthusiasts began to make grand claims that Logo was the panacea for an ailing educational system. They claimed that through Logo, in any and every way, any type of learner, for any amount of time could achieve miracles of learning. Needless to say, Logo has not lived up to those sweeping claims. Nothing could!

While much of the research has not been able to substantiate the learning or transference of cognitive skills, flaws in the studies have shown us things that educators should be looking for. Such as:

(1) Use of a more structured approach to teaching Logo, to ensure that students achieve mastery, without going to a classroom type of teaching.

(2) Development of a consistant study guide that "helps the children learn powerful ideas by partially directing their activities and then prompting them to reflect on their results." Leron (1985)

(3) Studies in the past have not tested subjects for mastery of Logo. If no mastery is achieved, how does the transference of skills occur?

(4) Most of the research has been done over a relatively short period of time. Some studies indicate that more time may improve a student's chance of developing better programming skills.

(5) Child to child interaction may be one of the most significant outcomes of Logo.

(6) Some studies did not use a control group.

(7) The most important flaw is in recognizing the importance of teacher interaction with the children. Questioning strategy seems to be the thing that makes the most difference in the gains of the students, particularly if it is used before, during and after a learning session.

Regardless of the outcome of research, Maddux and Johnson make a good point in their analogy, "An observer who hypothesizes the existence of a tenth planet in our solar system may point his telescope at a given spot in the sky. If he sees nothing, he has failed to provide evidence for the existence of the tenth planet, but he has not proven that no such planet exists."

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Why should Logo be included in a school's curriculum?   Even if we never prove that children's cognitive skills are enhanced by Logo, there are other good reasons for it being taught.   Some of those reasons are:

    (1) Interesting things can be done with Logo after a minimum of instruction. Therefore, it may serve as a motivational tool for some children.

    (2) Logo provides a way to work with spatial relationships and abstract concepts in another way.

    (3) Logo helps promote social interaction and peer tutoring.

    (4) Math and geometry can be learned in an interesting setting.

As they say, the jury is still out. More research, better organized and longer time-frame research is needed before a final verdict is pronounced on Logo. But as for me and my classes, we will continue using, enjoying and learning from Logo.

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TEACHING COMPUTER LITERACY? DON'T WORRY! BE HAPPY!

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Using a hands-on approach, this presentation will provide participants with the tools to breathe new life into their Computer Literacy programs. Teachers do not have to be skilled programmers or have creative talents to provide their students with a pertinent, meaningful, and applicable course in Computer Literacy. Software programs will be examined that enable students to explore informative and interesting activities as they acquire skills in word processing, data bases, and spreadsheets. Lessons can be individualized easily for heterogeneous grouping and provide challenging and rewarding experiences for each learner. Lesson plans and step-by-step instructions are provided to help both the novice and experienced Computer Literacy teacher create a well-organized, positive, and motivating learning environment.

As Computer Literacy teachers, we must continue our endeavor to extend our course beyond the basics. By providing our students with the skills that enable them to use a computer to write and edit text; sort, search, and select information in an electronic file; and manipulate figures and make predictions using an electronic ledger, we are truly making them computer literate. The feedback on this program from students, parents, teachers, and administrators has been unanimously positive.

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Logo in the Curriculum:
Examples from Mathematics and Science

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Because of its flexibility and power, Logo is appropriate for use in many areas of mathematics and physical science teaching. Because of its extensibility, Logo can be configured for use by students of many different ages. Logo helps students learn about operations with signed numbers, geometry, functions, state change operations and vector manipulation. Linear motion, acceleration, simple harmonic motion and electrostatics become interesting topics when studied with Logo. Logo can be used to construct simulations of physical systems, to create fractals, to study chaos and to explore robotics. Examples such as those provided may serve as sources of ideas for additional applications.

Logo was developed for use in education. As a result, it possesses many characteristics which make it appropriate for use in many subject areas, including mathematics and physical science. For example, Logo is interpreted, procedural and extensible. It is easy to learn initially, but is capable of complex operations. Logo lends itself to constructing simulations, learning list operations and practicing state change operations. It is an excellent introduction for the study of Pascal, artificial intelligence or robotics. Logo is capable of connecting easily to various other devices, such as speech synthesizers, video disk players, graphics tablets and sensors.

These characteristics add up to a powerful tool for learning, especially in mathematics and physical science. But, as impressive as these characteristics may be, Logo is most elegant in its simplicity.

Consider for a moment the FORWARD and BACK commands of turtle graphics. These are among the most elementary commands, usually the first ones taught to a novice user. Although the commands accept a number as input [such as FD 100, for example], it is often a surprise to some that the number can be either positive or negative [such as FD -100]. Using both positive and negative numbers with FD and BK produces some interesting results, and gives students personal experience with the concepts of adding and subtracting signed numbers without having to confront the formal rules.

Another example serves to illustrate how quickly something simple can become complex. Consider the following set of commands. What numbers go in the blanks so that the turtle will return to its starting location?

```
FD 100 RT 90 FD 100  RT _____   FD _____
```

Suddenly the Pythagorean Theorem begins to make sense. But then things get a bit more complicated. This next example requires the use of the arctangent function for a solution!

```
FD 100 RT 90 FD 150 RT _____ FD _____
```
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And this final example requires an understanding of the decomposition of vectors into components.

```
LT 30 FD 50 RT 70 FD 80 RT _____ FD _____
```

These two simple examples from mathematics and science also demonstrate that a lot of Logo teaching time is not always necessary in order to get students involved with the learning activity.

The programming technique of recursion offers additional opportunity for study in mathematics and science. For example, here is how uniformly accelerated linear motion could be simulated with Logo.

```
TO ACCELERATE   :SPEED
FORWARD   :SPEED
ACCELERATE   :SPEED + 5
END
```

With each recursive call, the distance the turtle travels is increased by 5 units. This has the effect of making the turtle travel faster and faster as time goes on. If the turtle is also moved sideways when such a procedure is running, a parabolic shape appears, suggesting the trajectory of a ball which is thrown into the air.

Learning activities with more complex concepts are possible with Logo. Many of these activities require the construction of specialized tool procedures. For example, when I provide Logo to my physics students to study electrostatics, I also give them appropriately named procedures for placing charges, for following electrostatic lines of force and for calculating the strength of the electric field at the turtle's location. These procedures are accepted by the students as specialized commands, and are used for their own purposes. Some of the more curious students may examine them for their own interest.

Logo can also be extended beyond the screen by making use of external ports. For example, information can be sent and received via the serial port with many current Logo versions. Sensors, switches and other peripheral devices become extensions of the learning environment.

With some recent products, such as LEGO® TC logo, it is possible for students to conceive, design, construct, test and then control their own devices and instruments using a version of Logo. This brings additional opportunities for students to practice the scientific method as they learn.

Although Logo has several curriculum applications in mathematics and physical science, there are a surprising number of additional applications waiting to be discovered and developed. After you and your students have tried a few of these examples, why not strike off into unknown territory and see what you can find?

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SPIFFY LABEL-MAKING MADE EASY

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Anyone can use "Labels, Labels, Labels" to make useful and impressive computer labels for envelopes, file folders, diskettes and many other uses. This versatile program combines multi-color graphics and text to make label-making easy and fun.

WHAT YOU WILL NEED:

Apple II+, IIe, IIc, IIGS, Laser 128, or Laser 128EX
At least 64K of memory (128K for color printing)
Dot matrix printer
Two disk drives preferred
(My preference: IIGS w/Imagewriter II)
Labels, Labels, Labels from Big Red Computer Club

OTHER SOFTWARE YOU WILL WANT TO HAVE:

Print Shop
Print Shop GS
Print Shop Companion
Print Shop Graphics libraries
Print Shop Sampler for GS
Print Shop Party for GS
GS07 and GS08 from Big Red

WHAT THE PRESENTATION WILL COVER:

How to print color graphics with text
How to print multi-color graphics with text
The steps to make a label
Kinds and sizes of labels you can make
How to use an existing database to print labels
Tips and secrets to get the most out of this program
Other software you will want to buy to make this program
    exciting
Big Red Computer Club information

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Using Computer Games to Enhance Thinking Skills
of Children with Learning Problems

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Children with learning disabilities, mild/moderate mental retardation, and/ or behavior disorders typically present deficiencies in one or more of the thinking skills associated with progress in school. Activities which are functional and familiar seem to be less threatening than traditional seatwork but activities that also are fun have the most appeal and serve best to motivate pupils. Two computer games are presented as providing the content and motivation needed for practice in association, classification, and other thinking skills. A very simple football game and a more complex adaptation of solitaire place the pupils in control of their moves and provide results which are identifiable with life situations.

Children with learning problems - mild mental retardation, learning disabilities, and behavior disorders - frequently are deficient in thinking skills based upon associations, classification, problem-solving, decisions based upon observed frequency or sequence of events, and other tasks involving synthesis or conceptualization of ideas. Thinking skills, defined as "...manipulation of perceptions to formulate thoughts, knowledge, reasons, or judgments." (Worshan and Stockton, 1986, p.9) are expected as the result of normal developmental experiences in nonhandicapped children. The exceptional child, however, requires even more developmental experiences than the nonhandicapped child but all too often the environment is one of deprivation during the vital preschool and primary years. In school, the child becomes impulsive or passive and increasingly exhibits a lack of regard for precision and accuracy in almost all approaches to learning (Chance, 1986). Deficient thinking skills are not likely to be acquired without intervention in the child's curriculum.

Traditional workbooks and paper/pencil methods fail to provide the needed variety of experience and motivation to progress in development of thinking skills. Games fit the lifestyle of children, engage children in learning tasks, and offer alternatives to traditional activities for learning (Shears and Bower, 1974). Due to their interactive capacities, computer games are attractive to children and in certain cases can provide practice in thinking skills. In order for computer games to be motivating, they should provide appropriate challenge, neither too difficult nor too easy. There should be sufficient fantasy with which the player can identify. Curiosity should be present in the form of feedback which will raise questions of a "what if" nature (Reynolds and Martin, 1988). Children with learning problems will be best served by games which initially are easy to play but have extensive possibilities for more complex interaction - low entry, high ceiling programs.

Two readily available, inexpensive programs are suggested for use in developing thinking skills by children with learning problems. "Football" (UPTIME, 19) is a very low entry game with appeal for a large population of children. The opponent can be the computer or another person. Each player selects a team name. A game clock (not real time) is controlled by the number of plays run. Choices for offensive plays are highly simplified - line plunge, end run, pass, field goal, or punt. There is no defensive strategy option or requirement.

Yardage is marked by an arrow that moves with an audible click for each yard to the new line of scrimmage following each play or penalty. Penalties are assessed by the computer following a message on the screen. All game information - down, yards to go, etc. - is displayed during the entire game on the scoreboard above the playing field. At the end of the game complete statistics are displayed for each team. The game engages the player on offense in constant decision-making with immediate feedback on the result of each choice. For the children who have difficulty deciding, the same play can be selected each down with some progress possible. However, the game seems to reward a mix of plays and the children soon will be thinking in terms of sequence, patterns, and "what if" possibilities.

"Three Musketeers" (Zelman) is a game of computer solitaire which offers extensive experience with classification, order, and seriation. It uses a complete fifty-two card deck which can be shuffled by the computer as many times as the player wishes. The cards are then dealt by the computer into a number of piles - six table piles with the top card face-up, a deck face-down, one to four piles representing the four suites with all cards face-up, and three cards face-down representing the three musketeers. The object of the game is to move the cards from table piles to the four suites in ascending order. The six table piles can be arranged in descending order by transferring cards from one pile to another. Cards of the same suite cannot be placed in juxtaposition. Points are awarded for each card transferred to the suites, however, fewer points are possible each time a musketeer is turned face-up. While the game is considerably more complex than "FOOTBALL", all commands are executed with one keystroke and a successful run of the deck is rewarded with a highly satisfying graphics display. "Three Musketeers" is an intense involvement with classification and order. The game can be played with very little attention to strategy and high score but as thinking skills improve, opportunities for arranging major plays will appear and the children will develop command over the flow of the game. Each turn of the cards will present opportunity to consider alternative plays.

The games should not replace other forms of instruction but they can serve a singular purpose. They provide a necessary alternative and a means of instruction to reach objectives that otherwise might be unattainable.

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What About Those Gifted Kids and Inquiring Minds: Using Computers to Make Problem Solving a Topic of Discussion

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This session focuses on how to encourage gifted students to reflect on how they solve problems. After a brief tracing of some of the historical movements used over the past 30 years to meet the needs of gifted students, the session will move to a demonstration of how problem-solving software can be effectively used to get students to talk about how they think about solving problems. Audience participation in a sample activity is encouraged!

Since the 1950s educators have used a variety of methods to stimulate higher-order thinking skills in students identified as gifted/talented or high potential. Prior to the introduction of microcomputers, we accelerated the rate of student progress through the curriculum, we enriched the curriculum with such activities as strategy games, simulations, and elective course offerings, and we introduced some students to programming in BASIC. In the 1980s with the introduction of simulation and problem-solving software and Logo, we were able to involve more gifted students in using electronic media to stimulate their higher-order thinking skills.

However, as we know, students need structure and follow-up activity to develop, test, and refine those thinking skills. Similarly, students often learn behavior that is modeled for them by their teachers and by other students. In this session, after a brief tour of some of the historical methods used to stimulate such thinking in gifted students, the audience will be invited to participate in a sample activity demonstrating how problem-solving software can be used to encourage students to think about how they solve problems and to apply such learning to new situations. Participants will be modeling/observing behavior that they can encourage in their students.

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SUCCESSFUL INTEGRATION OF THE MICROCOMPUTER INTO THE UNIVERSITY SCIENCE CURRICULUM

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The Chemistry and Biology Departments at Lubbock Christian University have been using microcomputers in their cur   m for five years. This has proven to be a very successful way to m   needs of different levels of students. Several programs will   onstrated, including instructor-written software that will be a   for copying.

"I really enjoyed working on the computer. It gave me extra help in areas where I needed it." "I found this hands on type of learning very reinforceful...". These are comments taken from a recent computer use survey administered in several chemstry and biology classes at Lubbock Christian University. The results of this survey are given in the following table:

	Very Useful	Useful	Neutral	Somewhat Useful	Not Useful
Computer use	50%	42%	5%	0%	3%
Written homework	26%	53%	16%	3%	3%
Lecture	39%	39%	16%	3%	3%
Textbook	18%	37%	18%	16%	11%
Commercial software	11%	61%	21%	8%	0%
Instructor written software	32%	55%	8%	3%	0%

Based on the results of the survey. CAI useage in science is beneficial for students. In fact, 13% of the students preferred all computer homework. 76% prefered a mixture, and only 13% prefered all written work.

Each week computer assignments are for the various classes. and the students taking these courses are expected to complete what is assigned during the week. At the beginning of a semester each student signs up for a 45 minute time slot, which is "his" for the rest of the semester. They are free to come in at other times and use the computer if one is available. The work is done on an individual basis except when there are limited copies of a software program and a large class. When this occurs the students can work in small groups, though this is not as effective as individual work.

In certain circumstances. two individuals are encouraged to work together, especially older students since they seem to be more oriented to

group work and often one is much better in math and actually helps teach the other. This seems to be equally beneficial to both.

The computer center is located in the Science building and is available to students during the day and Monday evenings. A printer is provided for student use along with two different word processors that can be checked out for use in the center. The faculty encourages their use for term papers, etc. A charge of five cents per sheet is made for paper. Primarily Apple II's are used but two IBM clones are available when needed. Disk magazines are kept in the computer center for students to read.

Introductory and General Chemistry students need frequent drill work, especially slower students or those with poor math backgrounds. Instructor-written rote drill lessons on Density, Gas Laws, etc. have proven to be of great value to pre-nursing students who have a GED and have never taken algebra. These programs will be available and may be copied.

Besides instructor-written software, there is a library of other science software, some of which is assigned from time to time. It is a standing policy to allow a student to check out any software owned, as long as it isn't removed from the computer center. This allows those who prefer CAI to spend extra time on the computer.

Biology is a rapidly changing area and students often need extra work to help them stay current.   Recently the Biology Department purchased a Biology series that has an editor on the disk so that questions can (1) be added, deleted, or changed as new information requires and (2) changed to increase or decrease the level of difficulty and make them more versatile. This is extremely useful in Cell Biology and in helping students prepare for the MCAT. Other Biology disks have limited graphics and 'are useful as a tutorial to cover a subject that can't be discussed as much as desired in class.   Simulations are good ways to check on a student's comprehension of a subject.   There is one very simple example that will be available for copying.

Biochemistry is nearly the death of some students, especially metabolic pathways. Any software in this subject is welcome. Unfortunately, there isn't a great deal of software available in this area. Some commercial software will be demostrated and there will be some drill programs available to copy that can be easily edited to fit the needs of nearly any class.

In Organic, IR and NMR simulations are used to help students identify unknowns. Also there is a very good organic synthesis game that both students and faculty enjoy. There will be a program demonstrated for a health science oriented chemistry class that may be copied.

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A KEYBOARDING AND WORD PROCESSING CURRICULUM FOR ELEMENTARY GRADES

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The Master Plan for Vocational Education approved by the State Board of Education on January 11, 1987 states that keyboarding and other computer competencies shall be offered K-6 beginning in 1988. In answer to this plan, the Temple Independent School District has developed a comprehensive computer curriculum addressing the areas of keyboarding and word processing. This curriculum is integrated directly into our existing Language Arts Curriculum.

The primary goal of our keyboarding program is to familiarize students with the operation of the keyboard so that use of any other computer program will be made easier. This keyboarding program includes 12 to 15 lessons per grade level. Each lesson requires approximately 30 minutes with a minimum of one lesson per week. Instruction in these lessons follows a specific format. Lessons always begin with direct instruction by the teacher. Proper posture and keystroking techniques are modeled. Finger reaches to new keys are demonstrated using a wallchart keyboard or a keyboard transparency. Directed practice on Type-right or practice keyboards will occur next. Dictation is used in developing rhythm in stroking. Software tutorials are used to reinforce instruction and provide repetitive drill for developing skill. Praise plays an important role in motivating students and ensuring success.

Keyboarding Awareness in Kindergarten requires students to locate and use the return key, space bar, escape key, shift and Caps Lock keys and arrow keys; to learn to use the mouse if available; to locate each letter of the alphabet as it is introduced in the regular curriculum; to type his/her first name; and to identify the home row. Software programs used are Computergarten by Scholastic and various MECC programs.

First grade students must demonstrate proper body/hand/finger position; use of both hands; familiarity with location of keys; and correct use of home row keys. Superkey by Bytes of Learning is used.

Second through fifth grade students must demonstrate proper keystroking techniques with proper directions of fingers from home row position to target keys and back to home row. Type to Learn by Sunburst is used in second and third grades. Microtype: The Wonderful World of Paws by Southwestern Publishing is used in fourth and fifth grades.

Expected outcomes for each grade level in keyboarding are:
Second Grade - 6 GWPM   Fourth Grade - 10 GWPM
Third Grade   - 8 GWPM   Fifth Grade   - 12 GWPM

Upon completion of the keyboarding lessons, students are instructed in word processing following a curriculum designed around language arts skills. The main goals for this Word Processing Curriculum are to enable students to properly use all the functions of a word processor and to produce documents composed in the language arts classroom. To ensure mastery of these goals, teacher demonstration followed by student practice is the procedure.

The Word Processing Curriculum contains 8 to 12 lessons per grade level. Each lesson requires 30 minutes with a minimum of one lesson per week. Word processing skills are taught in the following order:
1. File Retrieval
2. Cursor Movement
3. Text Deletion
4. Text Insertion
5. Text Creation and Storage
6. Text Production

An activities disk is prepared for grades one through five to guide students through the mastery of the first four skills. These activities are designed to reinforce use of parts of speech such as nouns, pronouns, verbs, and adjectives. In first grade, skills such as following directions, recognizing color words, alphabetical order, and classification are also included. After completing these activities, students are then ready to create, store, and produce compositions written in the language arts classroom. The word processor used in first grade is Muppet Slate by Sunburst Communications. Second through fifth grades use Magic Slate, also by Sunburst Communications.

The students in Kindergarten classes do not follow the same procedure in word processing as the other grades. They create and dictate language experience stories to the teacher. Then they observe the teacher enter these on the Muppet Slate program by Sunburst Communications.

The Temple Independent School District based this curriculum upon careful study of research, evaluation of computer software, and practical experiences in elementary classrooms within our district. We are in the process of piloting this program this year. Any questions or feedback you may have for us would be greatly appreciated. We encourage visits to our district to see this program in action.

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LISD/TAPP + ESC/IBM = Successful At-Risk Students

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A successful program for at-risk students at the middle school level will be presented. Software utilized in the program covers reading, mathematics, and language arts. The student population involved is overaged, academically deficient boys and girls. The testing program includes constant monitoring of TEAMS objectives. The program's objective is to take overaged seventh graders and be able to move them into the tenth grade within a two-year period and have them be on grade level. The organization of the school's program as well as the philosophy behind the approach will be presented.

The Lubbock Independent School District (L.I.S.D.) began the Transitional Academic Achievement Program (T.A.A.P.) to work with at-risk students in the seventh grade. As T.A.A.P. was being developed and organized, the decision was made to incorporate a computer assisted lab into the program curriculum. After an evaluation period looking at several software and hardware vendors, the selection of Education Systems Corporation (E.S.C.) software and I.B.M. hardware was made.

The students for T.A.A.P. were selected by application. At this time approximately 130 of the original 156 students remain in the program. These students are overage, have low scores on T.E.A.M.S. and C.A.T., and have normal intelligence. The teachers were also chosen by application and have exhibited a high level of concern for these students and a willingness to individualize instruction.

The T.A.A.P. schedule places a student in a language arts/reading/social studies three-hour block and a mathematics/science two-hour block. Since L.I.S.D. has a seven period day, the students are able to choose two electives. During the three-hour block, each student goes to the computer lab for 25 minutes each day. The computer curriculum alternates between reading instruction and language arts. The language arts instruction is writing oriented, using a word processor and story starters. During the two-hour block, each student goes to the computer lab for 25 minutes each day for mathematics instruction.

At the beginning of the school year, each student was tested using the Basic Skills Inventory which is part of the E.S.C. courseware. This inventory places the student at his/her appropriate grade level in the reading and mathematics software. After a review of the reports generated, the teacher decides if the student stays at that level or is moved. At the beginning of

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October, the seventh grade T.E.A.M.S. diagnostic test was given. This is also part of the E.S.C. courseware and reports are generated which indicate "by objective", "by student", and "by class" how the group has done. Also, the T.E.A.M.S. objectives are monitored throughout the E.S.C. courseware by using the results of the unit tests. That particular report indicates the student achievement on a particular set of lessons and which T.E.A.M.S. objectives have been covered. Therefore, the teacher is able to assess progress on the T.E.A.M.S. objectives and to make decisions about further remediation as needed.

One other aspect of the program is the concept of combining the seventh and eighth grade essential elements into one year. L.I.S.D. is referring to this as Phase I, rather than a particular grade level. Then, in Phase II, students will complete work using ninth grade essential elements. Ultimately, these students will move from the seventh grade to the tenth grade in two years and hopefully will be on grade level.

L.I.S.D. is planning to do a statistical analysis in the spring after the T.E.A.M.S. results are known in April.

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COMPOSITION APPROACH TO WORD PROCESSING

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The single most important skill students need upon graduation is the ability to communicate effectively! Our students need to improve their English ability. The computer is the perfect place to concentrate on this --the Word Processor takes the tedium out of English papers and allows us to improve the level of writing.

Composing at the keyboard is not a natural skill. The ability to compose business letters, manuscripts, messages is an essential skill for all future business leaders. They must be able to think and key information quickly. If the word processing unit is taught from the composition approach, the students will see it more as a complete tool instead of a substitute typewriter.

There are several benefits to this approach to word processing. Students get needed practice that improves their English. Students find that it is easy less defeating to proof and correct their compositions. Students even seem eager to improve their papers if a grammar checker is used in conjunction with the word processor.

I have developed a word processing teaching unit that incorporates the use of composition at the keyboard with the introduction of the word processor. It in no way adds any burden to the student in the learning of the particular word processor. The students aren't even aware that they are learning to compose at the keyboard.

This unit of study will more adequately prepare our students for the business world into which they will move. The computer and word processor can make quick work of any document--as long as the brain controlling it is trained in the most efficient, effective use. In the years that I have used this unit I have seen a dramatic improvement in the students' ability to communicate.

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COMPUTERS FROM YOUR FINGER/CHIPS

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The purpose of this program is to develop student awareness of the contributions of different ideas and devices throughout history which have had a bearing on the evolution of present day computers. The multi-faceted program traces the following uses of computers: as a counting tool, as a storage device(memory), as a programmable machine, as a time-saving instrument. Participants will: examine sample devices and computer components, receive an overview of the history of computers with a bibliography of outside resources, observe homemade games which reinforce computer history, and use PRINTSHOP-"Graphics Editor" to create lo-res graphics of the devices.

Multi-sensory teaching methods have been implemented throughout this unit, wherever possible. This project incorporates an interdisciplinary approach to instruction by utilizing these objectives:

a. examination and experimentation of sample devices and computer components
b. researching the history of computers from early counting tools to present day 4th generation computers.
c. enhancement by outside resources (e.g. speakers, fie..d trips)
d. correlation with computer graphics (e.g. PRINTSHIP "Graphics Editor")
e. presentations by students
f. incorporate Word Processing to create Paper Disk Facts
g. review and reinforce learning through games (e.g. "I have..who has..", COMPUTER HISTORY CHALLENGE- handmade electronic matching game, and teacher-made crossword puzzle.

The students are taken back in time to the earliest counting tool-fingers. From there we progress through hatch marks, knotted rope, piles of pebbles, to the sand table and abacus-all of which can be easily duplicated by the students. Our classroom has student-made samples of each. Parent speakers have come to class to demonstrate the abacus which reenforces its continued value for over 5,000 years, as the first calculator.

Research and collegues have added some intriguing facts about some of the famous contributers to the history of computers, s..:h as, Napier, Pascal Babbage, Lady Ada Lovelace and Jacquard. With all his idiosyncrasies, Pascal was a genius who invented a clever calculator with gears which is compared in class to antique adding machines, grocery store helpers and odometers. Students learn that terms dating back to 1801 with Joseph Jacquard, who is responsible for "jacquard knits", continue to be used today. The students also realize that his loom contributed the first memory device punched cards. They learn of teamwork and cooperative efforts of such important figures as, Charles Babbage and Lady Ada Lovelace, Presper Eckert and John Mauchley, as well as, Steve Wosniak and Steve Jobs. They learn of persons such as, Grace Hopper who has made numerous contributions over an extended period of time which have greatly influenced the impact of

computers in our lives.

Samples of computer components from various types and generations of computers have been collected for examination by the children. The variety of parts include: mechanical relays, vacuum tubes, transistors, integrated circuits, diodes, capacitors, resistors, microprocessing chips, paper tape, punched cards, cassette tapes, magnetic reels of tape, hard disks, keyboard, motherboard, peripheral devices-game paddles, joystick, and early numeric pad, and floppy disks of varying sizes-3½", 5¼", and 8". Some of these have been dissected for further inspection. A chip, for instance, has been unsoldered to reveal the chip itself. The pathways can be seen with a magnifying glass.

The students create their impressions of these inventions, devices, and components with PRINTSHIP-"Graphics Editor". This is an idea that I borrowed from Jane Holzapfel, a teacher technologist at Hogg Middle School in Houston ISD. The two of us have compiled a "graphics library" from the students' designs. The students use the keyboarding commands to create their graphics.

Using a word processing package, DOT Writer, the students each write about one of the persons, devices or computers that has been covered. This paragraph is then cut out and pasted into a paper "floppy disk" (CLASSROOM COMPUTER COMPANION, The Learning Works, Inc.).

Reviewing and reinforcing learning through games has been very successful. COMPUTER HISTORY CHALLENGE is made with: a thick cardboard or foam core, poster board, heavy-duty aluminium foil, masking tape, a 6 volt battery, porcelain socket, small light bulb, and alligator clamps. This will be demonstrated during the session. Many of the games used are not original, "I have... Who has...", "Bugs" and "Computer Pursuit" are among those. There will be handouts on each of these games. CROSS-WORD MAGIC is wonderful for a review. A sample will be provided in the handout.

Depending upon the time frame, student presentations of history of computer topics can be very effective. This project was targeted for my 5th grade classes whom I see only once a week for one semester. Since my class periods are only 45 minutes, time does not always permit this activity.

As a teacher technologist, I have developed, adjusted, and implemented this project over the past four years. Any first hand exposure the students can get has a more lasting effect than pure lecture. I do, of course, use transparencies and posters, as well as handouts. This information will be available in the handout. I compiled a duplicate set of the hands-on materials which can be checked out in Houston ISD through our Bureau of Technology Tech-Check-Out program, thus traveling from school to school for those who do not have access to the supplies. It has proven to be a useful unit which enables the students to broaden their understanding of the development of computers.

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DISCOVERING MUSIC WITH LOGOWRITER

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ABSTRACT

LogoWriter and its parent language, Logo, have been widely touted as a tool for turning abstract mathematical ideas into concrete objects to be explored, manipulated, and finally, understood by students. This idea is equally applicable to musical concepts. With LogoWriter, a student is empowered to manipulate the various dimensions of music - pitch, duration, and structure - in a concrete way. Without hours of repetitious drill on scales and five-finger exercises, a child can manipulate sound by simply reprogramming individual notes or blocks of notes until he likes what he hears. He has the opportunity to change it once or many times, and can immediately hear and analyze the results of that change. He can, in other words, hear and evaluate the effects of his own musical thinking. In this way, This paper presents objectives and activities the music teacher, or even a classroom teacher with no musical training, might use as a basis for *Discovering Music With LogoWriter.*

Many excellent computer teachers shy away from exploring music with LogoWriter because of their lack of musical background and training. This is unfortunate since experimenting with LogoWriter music is perhaps one of the easiest things a child can do which provides exciting and immediate feedback.

It was my great fortune this past summer to spend three weeks at the University of Virginia as a recipient of the UVA/LCSI Summer Logo Fellowship. With hints, help, and encouragement from Tom Lough, Glen Bull, Mike Charles, Mike Muir, and especially Judi Harris, I was able to complete a series of sequential lesson plans and LogoWriter procedures that can serve as the foundation for teaching basic aspects of music with LogoWriter. This project developed out of a six month research project I had previously done for my Master's Thesis, dealing primarily with development of ear-training and interval recognition using Logo. The success of the project encouraged a broader use of Logo for teaching musical skills and resulted in my first attempt to spread the word: a feature article in *Teaching and Computers* entitled "Music with Logo".

This paper and consequent presentation are a sampling of some of the ideas developed during the Logo Fellowship which will be shared with, and hopefully used by computer teachers who want to spark the interest of those students needing a little change of pace, non-musical classroom teachers who are required to teach music, and certified music teachers as a supplement to the original curriculum.

With the introduction of the TONE command, a child is introduced to frequency (pitch,) duration, and sound. To encourage those students with little musical training, some time should be spent with the simple exploration of the sounds that can be made. Children will discover that some frequencies are too high to be heard by humans; large duration numbers sound a long time; small numbers sound very briefly. Using REPEAT, sounds can be combined to make sound effects! Stories can be written using the sound effects invented by the writer. Much can be learned with this simple

introduction to LogoWriter music, and creative ideas for using computer sound will abound.

Using a pitch chart showing the frequencies for each note, the student can suddenly make music - not just sounds. He can sequence the various notes until they form a recognizable tune or an original composition. With further experimentation, duration suddenly becomes important if the tune is to have rhythm. It is sometimes at this point that the mathematical child becomes the music whiz. Since notes have relative value, the values can be multiplied, resulting in the tune being played slower, or divided, making it faster.

In the course of all these musical experiments, some child inevitably wants to program music from a musical score. This is the perfect opportunity to explain that just as LogoWriter uses a code to tell the computer which tones to play, so a musical manuscript uses a code to tell the performer which pitch and duration each sound must have. Handouts showing the correlation of frequency, alphabet letters, and musical notation now make sense and provide reinforcement for a concept the child now understands.

More in-depth music theory is presented with duple and triple meter, time signatures, scales and keys, rests, and major and minor intervals. Throughout the entire sequence of activities, the child must use his ear. Disciplinary problems such as those that might result from a child's embarrassment and insecurity in a performing class is seldom seen in a computer/music class. He is simply too busy listening to his own program and working with the notes until it suits him. The incidental learning that takes place includes visual recognition of notes and intellectual understanding of their relation to frequencies and durations. But the real value comes in what the student experiences by careful listening. And this critical listening, one of the skills educators have recently determined must be stressed in today's classrooms, might just transfer to other academic disciplines.

Try discovering music with LogoWriter. It's safe. No one will laugh at how you sing. It's fun. Just imagine fifteen computers operated by fifteen busy composers trying their musical experiments. It's challenging. Some may be satisfied with producing simple sounds; others will fill their disks with their classical piano music, their band music, their mother's favorite song, and appropriate holiday songs they have coded as the seasons roll around.

Although I am currently in the process of compiling a book of musical lesson plans and procedures for publication, portions of the project completed at the University of Virginia are placed in the public domain and may be reproduced for classroom use. For copies of the project, including Activity pages and Reference pages, please send a blank disk, $8.00 for reproduction costs and $2.50 for postage to the address listed above.

GRADEBOOK - VERSION 1939C

Mike Mitchell

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Gradebook Version 1989C is a computerized version of a teacher's gradebook. It is designed to aid the Apple II-using teacher in recording, maintaining, and reporting student grades and averages.

Gradebook Version 1989C is dedicated to:

Marie & David Mitchell and Terry Wayne Ethridge

Although Gradebook Version 1989C is copyrighted, it is free to all teachers everywhere! You may make as many copies as you need, and you may give Gradebook to any teacher that wants it.

Gradebook can maintain up to:

- 10 class periods or subjects
- 40 students per class
- 35 grades per student

Gradebook has four averaging methods from which to choose:

1. All grades are a percentage of the 6 weeks average.
2. All daily grades equal one test grade. Test grades are a percentage of the 6 weeks average.
3. All grades count as a percentage of test grades.
4. Total points

You have five assignment categories available, and you can have different weights assigned for different classes.

Six weeks averages are carried over from one grading period to the next. Semester and final averages can be calculated.

Grade reporting features include:
- Class Averages
- Ranked Class Averages
- Assignment Category Averages (Daily Average, etc.)
- Individual Student Record
- Grades for an Assignment
- Print Gradebook in a "spreadsheet" format
- Grade Report to Parents
- Combined Subject Transcript for non-departmentalized teachers
- Semester and Final (yearly) exams and averages

Change Class Data allows you to change grades, add students, withdraw students, change a student's name, change an assignment weight, and change an assignment name. You may also drop the lowest daily and test grades.

For self-contained or block-scheduled teachers, students are automatically added to or withdrawn from all of his/her classes.

A Utilities section has the following features:
- Print Missing Assignments
- Read Class Roll
- Print Grade Forms
- Code/Decode Special Students
- Change missing grades to another grade
- Enter Prior Averages for those who started Gradebook Version 1989C after the 1st grading period

There are Instructions on Side B of the disk. You may view the Instructions on the screen or print them. Instructions are accessed through the Main Menu, Side A.

Note: If you order Gradebook, please send $5.00 to cover my costs.

As a teacher, I don't want to make money off my fellow teachers, but I don't want to lose money either.

A DIFFERENT APPROACH TO BEHAVIOR MANAGEMENT

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Bernard Brown   Dallas Independent School District
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We will focus on affective classroom techniques that work in managing the behaviors of Emotionally Disturbed students. We will discuss and demonstrate software and how the components of those programs were utilized to enhance learning. Instructional aides that were found useful to motivate students to become more socially aware of appropriate behaviors will be discussed.

The computer does serve as an instructional aide for the classroom. In the Emotional Disturbed classroom, our objective is to help students gain control of their behavior so learning can occur. Thus, we will show how the computer can serve a dual purpose: help emotional disturbed students gain control of their behavior and assist in instruction.

Computer aided instruction plays an important instructional role in the Emotional Disturbed classroom as it provides additional practice in subject areas that students with low frustration tolerates normally aren't motivated to work in. The Emotional Disturbed student incidentally acquires a set of behaves that eventually are transferable, first to task completion and later to social situations that require problem solving in areas of frustration.

Regardless of the grade level, the computer assist the Emotionally Disturbed student in following a set of rules. The rewards are always immediate and seldom are the students bored with the task. Teaching appropriate social interaction is the key in making the computer accessible to the entire class. The social interaction that surrounding the use of the computer helps to set an environment where emotional disturbed students can successfully work with one another. Using students with low or very little self esteem as peer tutors and instructors allows the students to experience great personal successes.

Students are taught to directed negative behaviors and attitudes into positive productive energy while helping other students, sometimes non special education students, and teaching teacher how to use the computer. These successes are demonstrated through attitudinal changes, increases in friendship making skills, shorter periods of tantruming and fewer incidents of aggression, especially around the computer area. Since the students experience success socially and academically the computer becomes a necessary instructional aide in the Emotionally Disturbed classroom.

During the past three years we have had an opportunity to work with Emotionally Disturbed students from primary through high school age. We have developed some programs for students to acquire different levels of computer knowledge by earning permits and different kinds of licenses. This information will be made available to all interested.

Current Trends In Authoring Systems For Educators

T. Micheal Mooney

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Abstract

Today in educational settings there are two areas that deal with the use of educational software. One area deals with educators authoring their own software for instructional needs. The other area deals with using commercially produced software to fill instructional needs. Both areas offer advantages and disadvantages dealing with availability, ease of use, and cost. With the new state of the art authoring systems, educators will be able to produce quality software within a reasonable amount of time. By utilizing these new systems educators add the dimension of having new technology available for use with little training involved.

Introduction

In the recent past when educators wanted to develop software that was tailored around student needs, the educator either had to be a programmer or accept the limitation of authoring languages. The recent developments in authoring systems for use on the MacIntosh have added the capability of developing software on a system that requires minimal training and provides almost limitless capabilities. These capabilities range from animation to recording live sound in the lessons. By providing these capabilities , these authoring systems are starting to debunk claims that developing educational software requires to much time and is very difficult to develop. With these features built in educators are finding that they now have systems available that will allow for instruction to be tailored to fit student needs and how best to remediate and reinforce lesson objectives.

Authoring devices

Authoring devices are broken down into three levels of classification. These levels are:
1. Programming languages.
2. Authoring languages.
3. Authoring systems.

While the bulk of this article deals the use of authoring systems, The other two levels deserve attention since they led to the inception of these authoring systems. The primary languages used for authoring educational software are BASIC and PASCAL. Both are considered to be high level programming languages and provide the ability to control programs to react however the author wishes them to. These also require massive amounts of time in the coding and debugging stages to just get a single program operational. All programming languages provide the ultimate in control, but also require very specific commands to execute the

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In authoring languages some of the specific commands have been put together in macros to make the programming easier. while it is easier to master these authoring languages, there tends to be limitations that if you do not want to do what the language will allow then you can not do it. At times this will prove frustrating when trying to build stand alone lessons. Despite the drawbacks these do provide a little less of a stressful situation than using a programming language.

Authoring systems combine the best attributes of the previous two types of devices. These systems provide for ease of use and also allow the educator the same freedoms that a programming language does. Lessons can be tailored to fit the instructional needs and the ease of operation of one gives the educator an added dimension to consider as a vehicle of delivery. One new system on the market gives the added ability to write the program on a MacIntosh and then package it for either IBM, APPLE, or MacIntosh systems. With this added dimension it gives the educator more time in the development stages and does not tie them down to one particular operating system.

Advantages, disadvantages and other factors to consider

When the decision is made to acquire a authoring system several options need to be discussed. Most often these factors are overlooked and the product is deemed bad when it does not live up to assumed expectations. There are three areas that should be investigated before a final decision is made:
1. What advantages will this provide me with.
2. What are the disadvantages associated with this program.
3. What other factors have I over looked?

When reviewing a system the most important aspect is that of what benefits my needs by using this system. One should answer these questions;Is this easier to use than other means? Does it provide full animation and sound capabilities? Does it fit my present equipment? Remember to check dealer support, hardware, and other tangible factors associated with buying a state of the art authoring system so you do not have any unpleasant surprises when you start trying to develop usable software.

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ENGLISH/LANGUAGE ARTS: MAC WRITING LABS

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ABSTRACT OF PRESENTATION:

Helpful hints and handouts on setting up and using MacWrite and MacProof in a high school writing program. This session will give an overview and sequential steps in developing computer skills with a writing program, including demonstration of one lesson.

BODY OF PAPER:

SEQUENTIAL COMPUTER AND WRITING SKILLS FOR THE MACINTOSH LAB

LESSON 1: Using overhead transparencies and MacWrite Commands, teach the parts of the computer and the essential terminology. (classroom)

LESSON 2: Let students take the Apple Tour, working at their own rate of mastery. (lab)

LESSON 3: Review essential commands on the overhead in the classroom before going to the lab.

Check in unison to evaluate the students' understanding of commands and techniques learned on the Apple Tour. (lab)

Use practice activities on the computer files to master deleting, highlighting, font style, and other commands necessary for word processing.

LESSON 4: Review essential commands, such as saving, on the overhead. (classroom)

Teach steps in Print command. (classroom)

Type Bio poem on student data disk (previous homework assignment) and print for daily grade. (lab)

LESSON 5: Review fragments and run-ons or some other problem area in their writing. (classroom and homework from grammar/composition text)

Teach use of ruler for setting tabs, margins, spacing, etc. (classroom)

Use peer evaluation to check for fragments and run-on errors in paragraphs. (classroom and lab)

Type edited paragraphs and print for a daily grade. (lab)

LESSON 6: Teach various methods of writing introductions, emphasizing the thesis sentence. (classwork and homework)

Edit paragraphs using peer evaluations. (classroom and lab)

Type introductory paragraph and print for a major grade. (lab)

LESSON 7: Introduce the MacProof program. (classroom)

Practice the MacProof with a practice exercise. (lab)

Correct errors on a student composition model. (classwork and homework)

Use MacProof to correct errors on computer. Print correct composition for a major grade. (lab)

Check corrected version of text using overhead. (classroom)

LESSON 8: Revise a multiparagraph composition previously graded for content and structure. Edit by using peer evaluation. Print revised text for a major grade. (homework and lab)

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LESSON 9: Teach the use of multi-rulers as needed for long quotations and documentation. (classroom)

Using a previously written rough draft, type the rough draft of a multi-paragraph composition with long quotations and internal documentation. Print rough draft. (lab)

Use peer evaluation for editing and MacProof for proofreading. (lab)
Revise and print final text for two major grades.

REMEMBER TO USE THE CLASSROOM TO INTRODUCE AND REVIEW TECHNIQUES AND COMMANDS. GIVE CHECK TESTS IN THE LAB TO EVALUATE MASTERY OF TECHNIQUES AND COMMANDS BEFORE COMPLETING AN ASSIGNMENT FOR A GRADE.

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Special Technology for Special Students

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The Houston Independent School District (HISD) is placing at least one Apple IIgs computer in every school building which holds special education classrooms, provided the special education teacher has filed an implementation plan. The computer will be dedicated to special education student and teacher use. This is an extension of the use of technology already in place in the district for students with multiple and severe handicaps. This presentation describes the use of computers and adaptive devices, as well as the training and support of the personnel involved in the implementation.

Computers are a natural for special students. Computers have infinite patience, reinforce users consistently, catch every mistake they are programmed for, and never get angry. A computer can help students to communicate. Many physically handicapped individuals have above-average intellect and super-active minds locked inside uncooperative bodies. The computer can give these students control over their learning and life which they could never otherwise experience.

The Bureau of Technology is charged with the support of all instructional computing implementation within HISD. This means the Technology Trainers and other staff provide consultation, training, and additional support for all personnel involved in instructional technology implementation.

Teacher Technologists are the main source of information within each school building as to the function and use of computers for all HISD teachers, including those in special programs. One of our purposes as Technology Trainers is to provide Teacher Technologists with enough background and support to be able to help all teachers use computers effectively. We do this by offering update training each year. This year, the update training has included a detailed look at the Apple IIgs, an overview of special education programs, and a survey of adaptive devices for the Apple. This training provides the Technologists with the information they need to become informed resources for the special education teachers in their buildings, many of whom are new to computers.

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The approach we took to this training assumed many forms. We offered special education teachers:

- informed Teacher Technologists
- telephone support
- customized hands-on training
- video materials
- software preview center
- customized training for classroom aides

This variety of support options has helped us to reach hundreds of special education teachers and aides in HISD.

The cooperative efforts of the Bureau of Technology and the Special Education Department have extended to administration as well. Special education supervisors and their support staff are trained in the latest productivity software to help them keep track of materials and personnel. Special education personnel consult with Technology Trainers on a regular basis for the development of templates designed to make tracking students and resources easier. These databases can be kept at each school building, and then merged into a larger central database.

Ongoing communication between our two departments has facilitated the development and scheduling of necessary training classes, thus helping to maximize the comfort level of special education teachers and aides, while also helping Teacher Technologists deal with a large technology implementation over a relatively short period of time.

The primary goal of HISD's instructional computer program is to provide all students with as many opportunities as possible to strengthen their basic skills, and to provide them with challenges requiring the use of critical thinking skills. The Bureau of Technology supports this goal by providing an extensive training program designed to help special education teachers, Teacher Technologists, administrators, and support staff use computers and adaptive devices as effectively as possible in all areas of their instructional program.

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Computer Interfaced Probes and Science Experimenting

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Abstract

Data may be collected by an investigator or investigative team by means of sensory devices attached to a computer. Interface cards are inserted into the computer. Specially designed software is used to interpret and display data being retrieved by the sensory probe. The learning environment may be structured as individualistic, competitive, or cooperative--each of which produces different learner outcomes.

The sensory probes available today for use in secondary science classes vary greatly. These probes allow the gathering of information regarding time intervals, frequency of sound, temperature, light intensity, distance, velocity, acceleration, pH, voltage, muscle tension, skin temperature, heart rate, and respiratory rate. Computer interfaced sensory probes can be used in all sciences taught at the secondary level. They can be used in earth science, physical science, general biology, botany, zoology, anatomy and physiology, chemistry, and physics.

These computer interfaced probes allow for the collection of data that would otherwise be impossible. For example, it will continuously record temperature as an investigation is ongoing, or give a screen print image of temperature fluctuations. There is often the option of printing a hard copy of the screen image for more detailed study at a later time. The probes are effective for gathering data regarding phenomena which occur over long periods of time or extremely short periods of time. Most of the probes seem to be reasonably accurate. The devices on the market today have instructions for adjustment to help insure that measurements are accurate.

Currently there is a great range in price for the various probes. Most of the probes used in the physical sciences are less expensive (ie. Science Tool Kit Series). The probes used for many of the life science investigations are more expensive (ie. HRM's Biofeedback Microlab).

When considering implementing the use of the probes, it is important to remember that an interface card must be placed in each computer involve' in the data collection process. If one wants to use five com) ders in the lab, each must have its own probe, interface card, and software. Most labs do not have one computer per student or one computer per five students. The typical lab is fortunate to have a single computer available for lab use. As opposed to using a data base or a spread sheet, where the computer can be separated from the laboratory, the use of sensory devices requires the computer to be in the same general

vicinity as the ongoing investigation. It is often understandably impossible to obtain permission to modify the computers in a computer lab and then move the science class to the computer lab to perform an investigation.

Even though the data collection devices may sound like a valuable laboratory tool, it is necessary to realistically consider the computer to student ratio in the science lab and the science budget for software purchase. The consideration of these issues leads to the practical problem of how does one use this piece of technology (possibly limited in quantity) on the computers available (possibly limited in number) in a special environment--the science laboratory.

Students may still work in small groups, whether there is a ratio of students to computers of 25 to 1, 6 to 1, or 3 to 1. In the last two cases each group has its own computer. In the first case the investigation may be done by teacher, student, or a small group, and the rest of the class function in small groups. Typical laboratory groups tend to be competitive. The members within the group are competing against one another for the best or the most. This environment is very similar to an individualistic approach. Ideas are not shared. Peers are not encouraging. Errors witnessed by others are not necessarily corrected. Some students must fail in order for others to succeed. According to Johnson and Johnson in Circles of Learning, the preferred environment for students learning science is a cooperative environment--not an individualistic or competitive one. The Johnsons report both better achievement and better attitudes when science learning environments are cooperatively structured.

There are different types of cooperative learning. Robert Slavin supports a form of cooperative learning which is cooperative within the small groups and competitive between small groups. It is called Student Teams-Achievement Division (STAD). Some authors have indicated this form of cooperative learning is better for learning material which is not cognitively complex or complicated. One can also infer from reading about Slavin's cooperative learning that the average classroom teacher can grasp and use it fairly quickly.

Another popular form of cooperative learning is supported by David Johnson and Roger Johnson. This form of cooperative learning is more "purely" cooperative. Lessons are designed so that students are simultaneously individually responsible for material and responsible for other group members' learning. Individual student roles within the group are assigned. Teachers are to continually monitor, reinforce, and evaluate the groups and supply feedback. The primary supporters of this form of cooperative learning indicate it takes quite a long time to be truly proficient in its implementation. Johnson and Johnson's cooperative learning is also said to be more effective with material which is more complicated and involves more advanced logical reasoning.

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Youth Oriented Technology

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An overview of some current technology available to libraries that has
wide appeal to all types of students. Also information on purchasing,
operating, and maintaining these services.

I. Vendors of CD-ROM DISCS AND ONLINE SERVICES

   A. Newsbank - Index to 600 newspapers on microfiche

   B. Dialog - Online database search

   C. BRS - Online database search

   D. Text on Microform - Magazine index on microfilm

   E. Wilsonline - Online access to the Wilson indexes

   F. Wilsearch - Computer software package that accesses Wilson
        databases

   G. Wilsondisc - CD-ROM of Wilson indexes

   H. Infotrac II - Magazine Index Plus database on CD-ROM

II. COMPARE

   A. CD-ROM

   B. Online search

   C. Public Access Catalog

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III. NEED TO KNOW LIST

    A: Vendor

    B. File access/software access

    C. Customer lists/references

    D. Other considerations

IV. TYPES OF CD-ROM PRODUCTS

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<u>GradeWorks Plus</u>: Unleashing the Power of AppleWorks

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GradeWorks Plus is a new software product which provides teachers with a variety of classroom management tools. This collection of AppleWorks files contains gradebooks, a te~t maker, seating chart, documentation forms, and much more.

This presentation will be a demonstration and discussion of how this new product can be used by any classroom teacher, whether a novice or experienced AppleWorks user.

The introduction of AppleWorks has created a fantastic number of potential uses for all educators. Teachers, administrators, counselors, aides, secretaries, and coaches are all discovering different ways that AppleWorks can be used to successfully manage a large variety of information.

Some educators who are AppleWorks knowledgeable enjoy taking the time to design from scratch a spreadsheet, data base, or word processor document to meet their own needs. But the majority of educators tend to identify strongly with one (or both) of the following categories:

a. not completely familiar with the full range of AppleWorks capabilities and applications

b. would rather have the design and format for each application all set up ahead of time

As a classroom teacher and computer enthusiast who is truly hooked on AppleWorks (particularly designing spreadsheets and data bases), I've found many useful applications in a wide range of curricular and extra-curricular activities such as:

- Classroom record keeping and gradebooks
- Tests with different versions easily accessible
- Banks of test questions

- Progress reports
- Seating Charts
- Documentation forms
- Outlines

- Content-area games
- Loan charts & financial applications
- Printing labels
- Addressing envelopes on the printer

- Scorekeeping for large events such as:
    Regional choir competition
    State cross country meet

- Computing gradepoint averages school-wide
- Tracking of district-wide personnel information

These many and varied applications of AppleWorks have led to the creation of a new software package called GradeWorks Plus, published by Wordware Publishing Inc., Plano, TX. It's a 2-disk collection of 23 AppleWorks files designed specifically for educators, to assist in the many phases of classroom management. Most of the applications listed previously plus many others are available in the software package.

Many schools today are eager to have their teachers get involved with AppleWorks. However, in some instances adequate training is not readily available. Because of the features of GradeWorks Plus, even novice users can immediately produce documents which are customized to their own specific situation.

The benefits are many, because at the same time the user has the opportunity to:
- make productive use of the computer for educational applications
- learn AppleWorks
- create other related applications
- gain computer confidence
- have fun doing it

AppleWorks indeed offers unlimited potential to educators. If educators are interested in really using the power of the computer for their own classroom management, both novice and experienced AppleWorks users will find that GradeWorks Plus affords them the opportunity to truly begin to unleash the power of AppleWorks

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PIRACY ON THE HIGH-TECH SEAS

Use and Abuse of Copyrights

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ABSTRACT

Are you an educator? Public or Private? If yes, then read on.

Do you know what Title 17 is? Do you know the fundamental rights of a copyright owner? Do you know the fundamental responsibilities of the user of copyrighted material? Do you know when a copyright comes into existence?

This paper is intended to answer those questions.

"Can I get a copy of that?"

The question is heard often. It seems innocent enough. But, are we honest enough and willing enough to translate that euphemistic interrogatory to its most common meaning:

"Would you please make me a copy of that so I do not have to pay for the software myself?"

It is often said, by educators, that educators are the most prolific thieves of all professionals.

How serious is the problem of software piracy -- and not merely by educators?

"Software piracy is probably a serious problem. I say probably because there are no real statistics on it other than self-serving cries of anguish from software vendors who claim but for piracy, their income would have equaled the gross national product of Luxemburg", said author Boris Beizer in his book *Personal Computer Quality. A Guide for Victims and Vendors.* (Von Nostrand & Reinhold, Co., 1986).

Beizer suggests the long-term solution to the problem lies in vigorous, unmerciful enforcement of existing law.

THE LAW

Title 17. United States Code. The Copyright Act of 1976 (amended 1978).

The law stipulates that copyright exists the moment an original work is entered into a fixed medium (Joan Robinson, *An American Legal Almanac*, Oceana, 1978).

Sections 106 and 107 (Fair Use section) detail the rights of the copyright owner and the user of copyrighted material, respectively. (Robert Heinich, et al, *Instructional Media*, John Wiley & Sons, 1985).

In a broad categorical sense, the copyright owner has the following rights:

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1. right to make copies.
2. distribution rights.
3. right to public performance.
4. right to derivative works.

There are four principle guidelines in determining "fair use". They are:

1. purpose and nature of the use.
2. purpose and nature of the work.
3. brevity and spontaneity of use.
4. affect on the market.

BIG BUSINESS

Nearly a decade ago, hundreds of million of dollars in retail sales of software were made. In 1980 alone, IBM sold nearly $2 billion in software and software services, notes Michael Gemignani in an essay "Legal Protection of Software: A Survey" appearing in Advances in Computers, Vol. 22 (Michael Yovits, ed., Academic Press, 1983).

So, what's a little in-house thievery among friends, among teaching colleagues?

Besides noting the breaking of the law, one might consider putting themselves in the position of the software developer and/or vendor.

"The cost of software research and development is a primary concern," said William Gattis, Director of Educational Marketing for Tandy/Radio Shack, speaking at a computer educator's conference in Dallas in 1988.

"It is very costly, more so than textbook development where the publisher has a 10 to 12-year span to recover the costs of the development."

THE SOLUTION (??)

Many believe the primary solution, as in so many of the problems in society, lies in education.

Until you as educators respect the law, obey the law to the letter, teach the law in detail to students and convince them to obey it, the problem will never disappear.

One approach for school district protection is through the licensing of software at the school district or building level. There are various types of licenses available and among advantages is that it can "ameliorate the sensitive issue of illegal copying which is becoming a source of increasing irritation between schools and publishers," notes Robert Caldwell and Lamont Lockwood in a paper presented at NECC '89.

Do you know the law? Do you know the rights of the copyright owner? Do you know the responsibilities of the copyright user?

If the answer is no, then you are a major part of the problem.

THE VIDEO CONNECTION
Computers and VCR's Connect for High Technology

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Business Computer Applications
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home (505) 882-4041

VIDEO CONNECTION RECEIPT

1 Computer	1 Graphics Software
1 VCR Recorder	1 VCR Tape
1 Large Screen TV	

OPTIONAL INGREDIENTS

1 VCR Camera	1 Digitizer Card

Blend together well with knowledge and a genorous supply of IMAGINATION! The results will bring FUN and EXCITEMENT to any class.

The visual world is exciting and somewhat glamourous to all of us. This is a world where imagination can run free and with the use of high technology students and teachers can produce very professional videos that can be easily enjoyed by others. You may need to make a presentation to the local school board, or parent organization. Why not dazzle them with a very professional looking video produces in your classroom. Many computer educators are good at connecting hardware, cables and such....the tricks of connecting the hardware needed to produce computer generated video tapes will be demonstrated. Audience participation will be encouraged to produce a video during the session. The parts will be discussed, prices, and how to find, or even make, the cables needed for the connection of the computer to VCR hardware will be given. You will find that with a little work, vour classroom can be turned into a video production studio that will make everyone a star. Even the technical crew can be in charge of the credits at the end.

This is a presentation that can not easily be described in this proceedings book. You need to be a part of the video and let your imagination blend with the seasoning of technology. Be part of "The Video Connection"!

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THE HARDWARE CONNECTION
Transfer Apple Skills to IBM Skills

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Making students aware of similarities in software can help transfer the hardware knowledge. We must provide them with skills that will make their names stay on top of those job applications that are piled high on the desk of their future employer. Transferring skills across the hardware brands will provide them the opportunity to develop "The Hardware Connection".

Apple //e — 62 keys   vs.   IBM PC — 83 keys

The 21 extra keys on the IBM look overwhelming when a student or teacher is trying to transfer previously learned skills from the Apple to the IBM. In the academic classroom students and teachers become very familiar with the arrangement of the keys on the Apple and then suddenly and IBM machine is placed in front of them in the vocational classroom or the business from which they have recently acquired employment and they are told to word process a letter to a client. Panic can set in. It is our place as educators to make the students transfer those previously acquired word processing, spreadsheet, data base management and programming skills.

The extra 21 keys on the IBM will perform many of the same functions as do some of the combinations of keys on the Apple. The OPEN-APPLE key has many of the same duties as the ALT key. For example the simple re-boot of the machine --CONTROL-OPEN-APPLE-RESET............is..........CONTROL-ALT-DEL. CONTROL keys are very similar, when used with another key they can move the cursor to the end of a line of text, or begin underline, etc. The biggest problem is getting used to the change from using a combination of keystrokes to using single keystrokes.

The Apple software publishers have been aware of the similarities in the use of the special keys and have been very helpful by allowing the ESC key to just take you back a screen at a time. When a student or user happens to stroke the ESC key it helps them seem to gain control of the situation. It is a very secure feeling to hit the ESC key and see the main menu appear. ----- BUT while my students had diligently entered records into DBASE III+ on the IBM....one of them happened to hit the ESC and it aborted the entire operation. Needless to say that particular student, myself, and the entire class become very frustrated. What a difference, the student's self-confidence, as well as my self-confidence was shattered. The previously learned database skill was ruined by a single keystroke. The software and hardware had made a big difference in our attitudes. As

teachers, we must strive to link the skills that students have acquired and make them realize that not all of the keys work the same way on all the machines. We must also teach that most of the skills learned will transfer across the hardware and software worlds, but that caution must be taken in preforming some tasks.

This presentation will give you the teaching strategies that have been used with the vocational students at Technical Center, El Paso I. S. D. . The Tech junior and senior students successfully made the transfer from the Apple machines to the IBM machines. Similarities in hardware, as well as software are pointed out while the students are learning the new software on the IBM. There will be a discussion of APPLEWORKS comparison to MICROSOFT WORKS. BANK STREET WRITER, PFS, and EDUCALC were compared to DISPLAYWRITE3, LOTUS 1-2-3, and DBASE III. Programming in BASIC is very similar with just a few changes. The mysterious 21 extra key~ will also be discussed, with details on the FUNCTION KEYS.

Transferring the skills is the one of the most important parts of the computer educators' job. As we all well know the newer machines are including more and more special keys. Students must also have the opportunity to use the mouse for data entry. Question, "Will most of the hardware introduced in the next few years use the voice recognition device?" Whatever means of data entry, our students must be able to make *THE HARDWARE CONNECTION!*

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The Computing Technology Videodisc

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Abstract

The Computing Technology Videodisc is an organized collection of still visuals and brief motion video clips in laservision videodisc form, which is used as a classroom teaching resource for all levels and aspects of computer education. This presentation covers use of this item in the classroom and techniques of teaching with the videodisc medium as a "visual database."

The Computing Technology Videodisc was developed as a joint project of Texas Tech University and Sunbelt Technologies of Lubbock, Texas. The videodisc is designed specifically for instruction in computer literacy, data processing, computer science, educational computing, and other aspects of computer education. The videodisc contains over 1,000 still visuals and approximately twenty brief motion segments dealing with computing technology. It is available for purchase for $99.

This CAV format videodisc can be used for group instruction with any standard laservision videodisc player independently of any computer system. By using the printed index, a teacher can access any portion of the videodisc at random almost instantly by using the videodisc player's remote control.

The videodisc can also be used for individualized computer assisted instruction (CAI) with the addition of a computer, a videodisc player interface, and appropriate software. CAI software, employing the videodisc, for use with IBM/compatibles, Macintosh, and Apple II line computers is under development at this writing.

A content outline for the Computing Technology Videodisc is shown below:

1. History and Development of Computing Technology
2. Components of Computer Systems
3. Computer Programming & Flowcharts
4. Personal Computer Systems
5. Mainframe and Mini Computers
6. Telecommunications and Networking
7. Computer Applications in Business & Industry

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8. Computer Applications in Education
9. Computer Applications in the Arts & Other Areas
10. Robotics
11. Emerging Technologies
12. Potpourri

Contributors of visual materials included in the videodisc include Apple Computer, Amdek Corporation, Beagle Brothers, Britannica Learning Corporation, CONDUIT, Eanes School District, Educational Activities, Epson America Inc, Electronic Arts, Glen Fleck Inc, ICT Corporation, Lubbock School District, Owen Murphy Productions, Scholastic Software, Tandy Corporation, Texas Tech University, Xerox Corporation, and others.

The Computing Technology Videodisc may be purchased for $99. Purchase orders and personal checks are accepted. Orders and inquiries should be directed to: Sunbelt Technologies, Box 4447, Texas Tech University, Lubbock, Tx 79409.

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ALTERNATIVE KEYBOARDS FOR THE YOUNG OR SPECIAL NEEDS CHILD

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When the young or special needs child has difficulty accessing the computer through the traditional keyboard, alternative keyboards often facilitate success. The Muppet Learning Keys, Touch Window, PowerPad and Unicorn Board serve as alternate input devices appropriate for both populations.

The Muppet Learning Keys provide an appealing, simplified keyboard for the young child. The alphabet and numbers are displayed sequentially to emphasize correct sequencing and to decrease unnecessary searching for specific keys. The child also has a choice of colors for each graphic. Available programs include: cause/effect, readiness skills, early academics, and beginning word processing.

When the Muppet Learning Keys remain too difficult, the Touch Window is often appropriate. Some programs which require two step responses on the Muppet Learning Keys, only require one when the Touch Window is mounted on the monitor. The individual simply touches the desired response. Programs available for the Touch Window include: readiness, beginning academics, and manuscript handwriting. Speech synthesis is optional for some programs.

The PowerPad provides a larger surface area for an individual's response, when more severe motor problems are present. The PowerPad's surface is easily programmed to accept a number of different configurations. These can range from the simplest, a single input from the entire surface, to a larger number of choices when appropriate. The PowerPad can be used for cause/effect, matching or early language skills. An Echo speech synthesizer is required for most programs.

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Using the Unicorn Board requires an Adaptive Firmware Card, but provides a complete enlargement of the standard keyboard for work processing. Custom overlays can also be purchased for some commercially available programs and provide only those keys necessary for running that program. The Unicorn Board can also be programmed to meet every individual's need, through the Adaptive Firmware Card. Speech synthesis is optional.

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The Scoop on Skylines

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At Midway Junior High, as part of the Computer Literacy course, seventh grade students study the BASIC computer language. The culmination of this unit is a study of low-resolution graphics with emphasis on utilization of loops and variables. This presentation demonstrates a sequence of skills which allows all students to experience success.

From the time Computer Literacy was mandated by the state, computer teachers have faced the monumental task of developing innovative projects on the computer. The course is one that allows infinite options for creative planning. Therefore, developing teaching units has been exciting and challenging.

Only time, knowledge, and imagination limit the teacher. Much time is spent planning a unit only to find the plans need refining after teaching. There is always the unknown aspect of computers. Some techniques are developed by your students. Some are learned through attending workshops, reading computer magazines, and communicating with other teachers. So, as teachers, we are delighted when we find another teacher has developed and refined a teaching unit that suits our needs.

During this presentation, I will demonstrate a graphic unit that has been very successful in teaching my students techniques of programming low-resolution graphics. Participants will receive hand-outs at the end of the presentation that include duplicates of transparencies used during the presentation. Student's projects will be displayed during the demonstration. Disks will be available.

The presentation will begin with a brief explanation of how the unit is introduced. Students have learned beginning BASIC commands including IF-THEN and FOR-NEXT loops and worked with variables before introducing the graphics unit. The city skyline is excellent for extending student's ability to use the loops and variables.

The sequence of developing the skyline includes teaching the layering technique of graphics, gives practice for line numbering, relates importance of REM statements, and emphasizes the use of the FOR-NEXT command. A FOR-NEXT command is used to draw rectangles for the background and all buildings. It is also used to draw windows on the buildings, make a light blink, and an elevator move. The skyline produces a three-dimensional picture and prepares the student to create other sophisticated graphics. My presentation also includes appropriate activities to interest and challenge the advanced student during the graphics unit.

The graphics unit is the final unit taught in the Computer Literacy course, the highlight of the year. Anticipation is high, imagination abounds, and attention is at its best. It is a most satisfying experience for the teacher and the students.

Designing and Using a Civil War Spreadsheet Simulation

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Although the emphasis of instructional computing has typically been on Tutor applications, such as computer-assisted instruction (CAI), it is usually the Tool applications which introduce and then "hook" educators to computers. The purpose of this presentation is to give one example of how to bridge the gap between Tutor and Tool by showing how to use one computer tool, namely an electronic spreadsheet, directly in the instructional process. This one example illustrates several instructional opportunities which would have been unreasonably difficult or impossible to manage without computer technology. With the help of the spreadsheet, students can learn about the Civil War over a wide range of instructional objectives at many levels of learning.

Virtually all of the typical uses of the computer in education fall neatly into one of the three categories proposed by Taylor (1980): computer as Tutor (computer-assisted instruction [CAI]); computer as Tool; and computer as Tutee (also known as programming). Although the literature liberally speaks of the impact of educational computing in terms of Tutor applications, most of the incentive for teachers to actually use computer technology is through Tool applications, such as *The Print Shop* and *Appleworks*. While there is general agreement that proficient use of these computer tools provides indirect benefits to instruction, such as giving the teacher more time to spend on lesson preparation/management or to give students more individual attention, little has been documented in trying to apply educational computing tools directly in the learning process.

The delineation between direct and indirect instructional benefits of computer tools has been aptly defined by Siegel and Davis (1986) who borrow from Toeffler (1980) to discuss second wave versus third wave educational computing. Third wave educational computing involves innovative and creative uses of computer technology which is learner-centered whereas second wave educational computing follows a hardware-centered or technocentric approach — "number crunching", if you will. Most of the documented attempts to involve computer tools in instruction center around word processing and student writing. The purpose of this presentation is to present a concrete example of how an educational tool, specifically a spreadsheet, can be used to directly affect student learning of social studies facts and concepts, specifically those which were involved in determining the outcome of the Civil War. It also presents an example of how the computer creates instructional opportunities which would be either impossible given other educational media, or so difficult and cumbersome that it would no longer be a viable option.

A Third Wave Educational Application of Spreadsheets

What follows are the possible phases of an instructional design which relies on a spreadsheet to accomplish many of the objectives in a unit on the Civil War. As you read the following scenario, remember that the means are much more important than the ends, that is, you and your students will have a working Civil War simulation when the unit is finished, but the instructional value came from how you and your students constructed it. Also remember that the following represents but an example of such an instructional scenario to start you thinking about how a tool, such as a spreadsheet, can be used to directly affect learning outcomes.

Phase 1-Selecting Facts

The first phase involves a significant amount of "fact finding" as students try to list the many factors which were involved in determining the outcome of the war. Students know (we hope) that the North won the Civil War, but have they ever asked themselves "Why?". Many students (especially in northern states) see the Civil War as a "good versus evil" story with a simple naturalistic ending: the good North (against slavery) winning over the evil South (in favor of slavery). Students must detach themselves from the emotional side of the war in favor of military and economic determinants. This fact

finding should be purposeful in that students should concurrently be determining if each of these factors is isolated (such as the raw number of troops) or interrelated (such as naval strength and economic factors such as trading cotton with European markets). The nature of these interrelationships will become more complex and important later, but it is important that students "look ahead" as they accumulate this reservoir of facts. The associated spreadsheet activity is to organize and label the spreadsheet appropriately.

Phase 2-Organizing the Facts and Concepts

There are two tasks associated with this phase. The first task is to compare and contrast the North versus South on each of the isolated factors. Some of the factors lend themselves easily to such a comparison, such as troop strength, because they are already quantified. Other factors, such as troop moral, have no such easy "yardsticks" for one to apply. Therefore, a decision must be made to use an agreed artificial ranking system for factors such as "troop moral", such as "on a scale of 1 to 10, with 1 being the lowest, rate the troop moral for the North and the South". This activity by itself leads to interesting insights of historical interpretation. The associated spreadsheet activity is to input these historically derived "scores" into the spreadsheet. The second task of this phase is for students to compare and contrast the North versus South on each of the interrelated factors. Completing this task again involves recognizing and compromising many complex historical issues. One stunning historical example of the Civil War which shows how one individual factor can affect one or more other factors as in a historical game of "pick-up sticks" was the relative naval strength of the North and South. The effectiveness of the Northern blockade of Southern ports directly affected the selling of cotton to European markets which affected the ability of the Southern economy to finance the war effort. The purpose of this task is to document the actual historical relationships and then to translate them into mathematical formulas for the spreadsheet.

Phase 3-Integrating the Facts and Concepts

Once the spreadsheet is properly set up with historically derived values and relationships, students can check their accuracy by summing up the various scores. Simply put, the side with the largest score wins. If properly done, the North wins. This by itself provides interesting informative feedback. If the South's score is larger, then obviously something is amiss, as we can't change history! But the next task, only now possible because of the capability of the spreadsheet, involves the potential for hypothesis-testing via "What if?" games. For example, consider what the consequences would have been if the South had a navy which was as strong or stronger in force than the North. This question, in and of itself, should pose many healthy discussions and debates. However, the spreadsheet allows us to go further to play with history and actually test our hypothesis. All the student has to do is change the South's "true" naval strength score with a hypothetical one and the spreadsheet automatically recalculates to give a new final score and therefore a new hypothetical outcome to the Civil War!

A Final Word

Rather than have the computer mimmick instructional techniques from other "traditional" media, the computer can be used to present instructional opportunities which are uniquely suited to its capabilities. Once an educator begins to look at computer power from a third wave perspective, the whole arena of educational computing can take on new meaning. (Note: A working copy of the Civil War spreadsheet discussed above is available to educators using *Appleworks*. Write to the author at the aforementioned address.)

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Taylor, R. (Ed.). The computer in the school: tutor, tool, tutee. New York: Teacher's College Press, Columbia University, 1980.

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*** Software DEMO: King's Rule and The Factory ***

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Develop problem solving skills and inductive reasoning using interactive computer programs. A demonstration of two software programs. The King's Rules, which allows a student to generate and test a hypothesis (patterns/sequences) and The Factory, which allows a student to create geometric "products" on a simulated machine assembly line (working backwards).

THE KING'S RULE

Mathematics and discovery: a guess and test activity to teach hypotheses testing and hypotheses confirming. Students try to discover numerical rules that allow them to work their way through a king's castle. They generate and test a working hypotheses by asking questions, trying out new number combinations, and requesting recaps of data.

OBJECTIVES:

** Practice in forming and testing hypotheses.
** Recognition of numerical patterns and relationships.
** Develop skills in critical thinking and problem solving.
** Development of strategies.
** Practice of mathematical skills.

THE FACTORY

Designed to teach problem solving strategies. Focuses on working backwards, analyzing a process, determining a sequence, and applying creativity. Students are challenged to create geometric "products" on a simulated machine assembly line that they design.

OBJECTIVES:

** Develop inductive thinking.
** Integrate skills in visual discrimination and spatial perception.
** Experience in understanding the importance of sequence and order.
** Experience using the cognitive strategy of working backwards.
** Understand that there may be more than one solution to a problem.

**** PROBLEM SOLVING and STRUCTURED BASIC ****

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Can we use Structured BASIC to promote and develop problem solving techniques? Polya's four phases of problem solving, 1) Understand the Problem, 2) Devise a Plan, 3) Carry Out the Plan, and 4) Look Back, are essentially the same steps used to write a computer program. These steps, the use of patterns and trial and error problem solving, the development of algorithms, top-down design, and good programming style can equal "Problem Solving and Structure BASIC". This presentation will demonstrate "how-to" structure the BASIC programming language, provide a suggested outline and sequence for a semester course, and discuss the method of instruction and type of problems used.

****

Problem solving is not an academic course, but is taught across the disciplines. An elective computer programming course can be used to promote problem solving skills and introduce structured programming. Normally the next computer related course will not be available until the student finishes Algebra I or enrolls in a Business Education course. For many students, Computer Literacy will be their and last computer course. If a student has the desire and/or need to learn BASIC programming it would be on their own initiative. A solution could be the introduction of an elective problem solving/computer programming course.

This could be an 8th grade elective course sharing the computer labs established for Computer Literacy. In a one semester course three of the four programming structures can be introduced; 1) sequence, 2) selection, and 3) the loop. The fourth 4) a procedure could be left for a more advanced programming course.

The programming would be an extension of the BASIC programming introduced in the Computer Literacy course with emphasis on using the computer and BASIC programming as a problem solving tool. The students would use algorithms, pseudocode, flowcharts, problem solving techniques, and the syntax of a high level computer language-BASIC to solve mathematical problems.

<u>GOALS:</u> * Develop problem s. lving techniques.
 * To practice problem solving techniques; trial and
    error, patterns, and working backwards.
 * To write algorithms/pseudocode/flowcharts for problem
    solving.
 * Provide a background in structured BASIC programming.
 * Emphasis on structured programming and problem solving
    using mathematical problems.

OBJECTIVES:
* Write and develop algorithms/pseudocode/flowcharts.
* Create and interpret flowcharts.
* Develop problem solving skills.
* Learn the syntax of a high level language.
* Apply the syntax of a programming language to problem solving situations.
* Interpret program instructions.
* Find and correct program errors.
* Write reasonably structured programs.

The following keywords(verbs), commands, and functions can be introduced and used in a one semester course:

KEYWORDS: REM, PRINT, END, LOCATE, TAB, LET, INPUT, READ...DATA, IF...THEN, WHILE...WEND, and FOR...NEXT.
COMMANDS: RUN, LIST, NEW, EDIT, RENUM, DELETE, SAVE, MERGE, LOAD, COPY, and FILES.
FUNCTIONS: SQR, INT, and RND.

Computer programming is the process of planning a sequence of instructions for a computer to follow. To write the instructions we must go through a certain process, a problem solving phase and an implementation phase.

In the problem solving phase we must:

* Analyze -- Understand and define the problem.
* General Solution -- Develop a logical sequence of steps (algorithm/pseudocode/flowchart) to solve the problem.
* Test -- Follow the exact steps as outlined to see if the solution truly solves the problem.

In the implementation phase we must:

* Write the program -- Translate the algorithm/ pseudocode/flowchart into programming language code.
* Test -- Have the computer follow the instructions, check the results and make corrections until the program solves the problem.
* Use -- Use the program for problem solving.

The steps in the program development cycle are very similar to the steps in problem solving. This will help develop the students ability to write logical sequences and reinforce their problem solving skills. The computer cannot analyze a problem and come up with a solution. The problem solving must be done by the programmer.

Integrating Academic Computing with Library Computerization

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Factors leading to a decision to upgrade specific functions of academic computing with the implementation of an on-line library system will be discussed. Network planning, and the academic computing needs of the liberal arts college, and efficient use of. resources influenced the decision to provide a single hardware solution supporting the integrated environment. The comparative results of an extensive investigation of various library software systems and site visits to other college campuses culminated in selection of DYNIX software running on a DEC VAX 8250 utilizing an Ultimate coprocessor with PICK operating system.

INTRODUCTION

Marywood College is a comprehensive college with a strong emphasis on the fine arts and social sciences. It has an enrollment of 2000 undergraduates and 1000 graduates in 27 graduate programs. As a liberal arts college with graduate programs in education, art, psychology, business and social work, Marywood College has a library collection with an extensive non-print component. The collection of videotapes, records, art slides, films and software are housed in the Media Center, part of a building connected to the library. Undergraduate majors in communication, education, nursing, ar, business, psychology human ecology and communication disorders are the primary users of camp 's computing services. With a student population concentrated in non-scientific majors where computer use is not foundational to the discipline, academic computing hardware is split between stand-alone microcomputer labs distributed among several campus buildings and terminals connected to a minicomputer. Thus, resources allocated to academic computing must support both microcomputer and minicomputer environments.

The minicomputer environment is necessary to support graduate student and faculty research along with undergraduate courses in computer information systems, primarily focused on programming. With the use of the minicomputer limited by the nature of the liberal arts curriculum and student population, when the library staff began to investigate possible computer systems to bring the library on-line, it seemed reasonable to include the possiblity of upgrading the present PRIME minicomputer to a larger, faster system. The option of an integrated system seemed especially appropriate for Marywood College since academic support services were viewed as cooperative units in one physical location called the Learning Resources Center (LRC) presently housing the library and media services.

CRITICAL FACTORS

The central question was whether a library software package could be found which met the criteria established by the library staff and also ran on hardware appropriate for the needs established for academic computing. First, the library needed a software and hardware system to fulfill a commitment made as a condition of a grant supporting the retrospective conversion of all library holdings to machine readable form. The grant set September 1989 as the deadline for a functioning on-line public access catalog (OPAC) for Marywood College. The second major factor was the critical need to upgrade the minicomputer environment supporting faculty and graduate student research and instructional needs of the business department. Other factors affecting the decision were downstream costs of supporting two systems, plans for both internal and external networking, and the local computer service support available.

Criteria for selecting the library system were extensive with consideration given to the following: 1) Ease of use by both novices and more sophisticated users. 2) The search capabilities of the system i.e., in addition to title, author and subject, were full-text, Boolean, and other searching strategies supported. 3) Accomodation of the extensive non-print collection within the database. 4) Parameter setting by library staff. 5) Integration with existing library standards and national database sevices. 6) The viability of the library software vendor and customer support.

Criteria for the integrated system centered on the ability of the selected harware to support academic software and compilers, the reliability of the vendor in the academic community, and costs associated with personnel and future upgrades to the system. Performance degradation of the integrated system was of concern to both the library staff and academic computing since memory, storage and access time would be affected by library searching.

SITE VISITS

Over a period of 15 months, library staff and the academic computing director traveled to over a dozen college campuses and public libraries to investigate library systems, several of which were part of a campus-wide network or an integrated environment. All but one of the integrated systems had integrated the library software with the administrative system of the college, doing little to provide easy access for faculty offices. In several instances, the library software ran on proprietary harware and was part of a campus network. The one site visit to a campus integrating the library system as part of an existing campus-wide Ethernet network confirmed the decision made earlier to purchase an Ultimate co-processor running DYNIX software using a DEC VAX 8250 as the platform. Installation of the DEC was completed in early January 1989, with software anticipated in the next month.

Altered States

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ABSTRACT

This presentation will address the topic of Finite State Automata and its applications. Techniques for coding state driven programs will be discussed and example programs written in Turbo Pascal will be examined. An attempt will be made to present this topic in an entertaining as well as informative way.

Finite state Automata and their corresponding state driven programs are heavily used in computer science. The most predominate application is in the area of language recognition. Compilers, interpreters, wordprocessors, spreadsheets and operating systems are just some of the programs that require some form of language recognition. In the case of spreadsheets one is often required to input equations (functions if one requires that terminology) into cells for automatic processing. An equation must follow a precise form and be recognized by the spreadsheet program in order that it may be executed using the indicated values.

According to Aho and Ullman [1] a recognizer for a language is a program that takes as input a string x and answers "yes" if x is a legal sentence of the language and "no" otherwise. Recognizers can be created easily using state diagrams called finite state automata. In an abstract sense a finite automaton is a mathematical model that consists of

1. a set of states S
2. a set of input symbols I
   (the input symbol alphabet)
3. a transition function that connects certain states with corresponding symbols
4. a designated start state
5. several designated final states.

The following example will hopefully clarify the above. Suppose it is required to build a recognizer for a string made up of a's and b's only. In particular suppose we are looking for a particular string of the form a(any no. of b's)aa. Example legal strings would thus include abaa, abbaa, abbbaa, abbbaa and so on. It is our mission to recognize the above strings. A finite state diagram can be immediately constructed for this language.

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The automaton requires only four states numbered 1 to 4 with state one being the start state and state 4 the only final state.
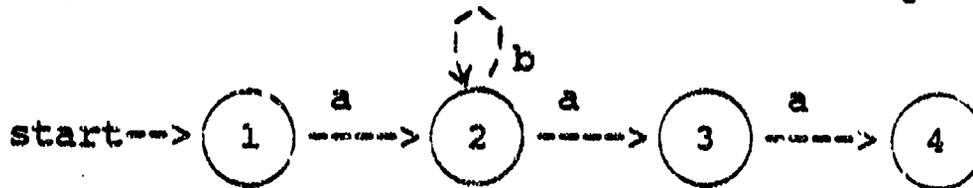
One moves thru the diagram by first retrieving the next symbol from the input string and moving along an arc that has that symbol label. If a state is encountered that has no outgoing arc matching the upcoming symbol then the string does not match. A string is matched if the final state is eventually reached.

The following pascal code exemplifies a simple technique for coding finite state programs.

```
procedure finite;
var state:integer; /* start state */
    c:char;
begin
  accept:=0;error:=0;state:=1;
  while not accept or not error do
   begin
    c:=getsymbol;/* fetch symbol from input string */
    case state of
      1: if c='a' then state:=2 else error:=1;

      2: if c='b' then state:=2
                    else if c='a' then state:=3
                            else error:=1;

      3: if c='a' then state:=4 else error:=1;

      4. if c='a' then accept:=1 else error:=1;

    end { case }
    c:=getsymbol;
   end {while}
  if acce  then writeln("The string is accepted")
    else writeln("This is not a legal string");
end;
```

The presenter will discuss the above program and it action with several different strings during the presentation. In addition several other examples applicable to the classroom will be addressed.

[1] Aho, A. V., Sethi, R., and Ullman, J. D., _Compilers Principles, Techniques, and Tools_, Addison-Wesley, 1985

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How to "Publish It!"

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The next logical step in the evolution of using microcomputers in the classroom is in the area of desktop publishing. Considering the number of Apple microcomputers in the nation's schools, educators need to become aware of the available software to address this area. "Publish It!" is the program to fulfill this need for the foreseeable future.

I purchased "Publish It!" as soon as I read an advertisement and several reviews about it. It does live up to its description and only has a couple of drawbacks. The only serious competition (in my opinion) is a program which requires an Apple microcromputer with a one-megabyte RAM disk. Since I own an Apple IIc and realize many other people and school districts utilize the same, I wish to present a demonstration of "Publish It!" and show how I have used it personally. The computer literacy classes I teach cannot utilize the program as we have a different brand of computer in the laboratory. However, I feel that teachers/administrators/ coordinators need to become fully acquainted with software in order to make the best decision for their students.

"Publish It!" comes packaged with both 5 1/4 and 3.5 diskettes (somebody really does consider the consumer). For those of you who are familiar with the program "Multiscribe" ™ by Styleware, you will notice a great deal of similarity with the pull-down menus and the choices within these menus. However, unlike "Multiscribe" ™ , you must use either a joystick or a mouse. Using a joystick is considerably slower than a using a mouse, and I would certainly recommend a mouse be used – you can use the keyboard for some functions (a la "Multiscribe" ™), but there is no keyboard key combination to print your document. Therefore a mouse is almost a necessity.

"Publish It!" does allow you to change the size of your font, but the edges of the letters remain clean, no matter what size you choose. This makes "Publish It!" ideal for creating overhead transparencies which are easier to read than those you may have created with other programs. The program's output is 120 dots-per-inch horizontally by 70 vertically. "Publish It!" does allow you to import Appleworks™ and Bank Street Writer™ files directly and documents created with most other word processors if the files are in standard ASCII format. I mention this because "Publish It!" is not one of your

faster word processing programs, a point brought out by the publishers themselves. The suggestion made in the manual is to prepare the document using another word processor, such as Appleworks ™, then transport the file to "Publish It!" The program does use much of the available memory, and you may be limited as to how many pages you can work on at a time; but with the Print Merge feature, you should not be faced with any insurmountable problems.

Not only can you produce documents with many variations in the print style, but you also have the ability to place "objects" anywhere on the page. Objects come in two classes – what I choose to call drawings and actual pictures. Drawings include lines, rectangles (boxes) – with both "square" and rounded corners, as well as ovals (circles). The user may choose the pen width with which these drawings are made as well as the fill pattern for them (a la MacPaint ™). Actual pictures includes the ones supplied with "Publish It!" as well as any drawn with Dazzle Draw ™, MousePaint ™, and also Beagle ™ Graphics files or any other pictures in Apple standard high resolution or double–high resolution format. Any object can be moved, re-sized, cut, copied, pasted or deleted at any time. This allows the user a great deal of freedom in redesigning the page layout in order to produce just the right effect. If an object is moved, "Publish It!" redistributes the text to fit around the object. Objects may be overlapped, but only that part showing on the screen will be printed. In fact, "Publish It!" is a WYSIWYG (what you see is what you get) program. However, depending on which monitor you use, this may not be entirely true. Using the "inexpensive" green Amdek monitor I own, I am always much more pleased with the printer output than I am with the screen display.

The user may buy additional disks containing fonts or graphics but the new 2.0 update of "Publish It!" is advertised as allowing use of Print Shop ™ graphics. If this is not terribly difficult to accomplish, then the program should be the desktop publishing program for the Apple II family for many years to come. A word must be said about the accompanying documentation. While, like most manuals, the "Publish It!" manual has some shortcomings, on the whole, it is well–written and easy to use. There are some things I had to try out in order to understand, but the manual is straight-forward, and for those of you already acquainted with desktop publishing, it should be very useful. Before you ask, I typed this using Multiscribe ™, saved it as an ASCII file, then transported it to "Publish It!"

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Programming in Computer Literacy - A Less BASIC Approach

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Programming is often the most difficult component of a computer literacy course both for students and teachers. A number of programming languages have been used for computer literacy instruction. The presentation will discuss the goals of the programming component of a computer literacy course, and the merits of a number of commonly used programming languages. The Karel the Robot language will be discussed as an excellent means of meeting those goals.

The goals of the progran.ming component of a secondary computer literacy course often emphasize the development of problem-solving skills rather than programming as an end in itself. As such, we must carefully consider the specific skills and concepts which will best serve the computer literacy student. The most important of these is an understanding of the top-down approach to algorithm development and problem solving. Such an understanding will serve the student well not only in any future computer-related endeavors, but in virtually all academic areas. Second, is an understanding of the fundamental control constructs, the decision and looping structures which are the building blocks from which algorithms are constructed. A student who has mastered these two important concepts will have gained valuable problem-solving skills. In addition, since some percentage of computer literacy students will go on to the study of computer science, the programming component of the computer literacy course should provide a foundation for future programming for those students.

The / ngramming component of computer literacy courses is most often carried out using the BASIC programming language. While some of the newer versions of BASIC are appropriate for accomplishing the goals of the programming component of a computer literacy course, many microcomputer versions of BASIC have significant deficiencies related to these goals. BASIC, like most high level languages is dependent on the use of variables, a dependence which impedes the learning of many students. Further, some microcomputer versions of BASIC are seriously deficient in control constructs, often lacking the WHILE loop and even the double-sided decision (IF-THEN-ELSE) constructs. These constructs can, of course, be simulated through the use of single-sided decisions and GO TO' owever, the resulting code is much less readable and understandable than

equivalent code written using the appropriate built-in control constructs. The introduction of the GO TO statement also tends to lead students to produce unstructured programs which are much more difficult to de-bug.

Logo has been used extensively with elementary age children and could be successfully used in a computer literacy course. LOGO i not an algebraic language, and does encourage the development of modular, top-down designed algorithms. LOGO does not however, normally emphasize the standard control constructs which most high level languages utilize, and this may present a problem to students who go on to other programming languages in high school or college.

Pascal is widely used in high school and college level computer science courses, and its use in computer literacy courses would clearly prepare a student for further computer science coursework. The language has a rich set of control constructs and was designed to support the development of modular, structured programs. However, Pascal is heavily dependent on the use of variables, and its strong typing requires considerable understanding on the part of the student of data types and variables. In addition, the introduction of the use of procedures and functions is often delayed by the volume of syntax which must be mastered and the complexities involved in the passing of parameters to procedures.

Karel the Robot is a programming language which was designed to be used at the college level as an introduction to the Pascal programming language. Karel is a 'robot' who lives in a 2-dimensional world of streets and avenues. Objects (walls and beepers) can be placed in Karel's world to create tasks for the robot to accomplish. The Karel language contains only 5 primitive instructions, and shares the major Pascal control constructs (IF-THEN, IF-THEN-ELSE, FOR loop and WHILE loop) and much of the Pascal syntax, including block structuring and the dreaded semicolon rules. Karel enforces structured code - no GO TO statement is included. Lastly, variables are not included in the language.

Due to the very small set of primitive instructions in the language, students quickly recognize the need for defining new instructions (procedures). The process of defining instructions is simple, and within the first 1 - 2 hours of instruction, students are able to master the syntax of the language and begin to write modular programs.

The Karel language has several advantages in a computer literacy course. It is small, enforces structure, encourages modular, top-down design, is graphical rather than mathematical in nature, contains all major control constructs, and teaches the majority of Pascal syntax and structure. Thus, it is a language in which it is possible for all computer literacy students to experience success, and at the same time, does an excellent job of preparing students to continue in high school or college level computer science courses.

Logo and Mathematics - A Problem Solving Workshop

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The presentation discusses the result. of a Logo mathematics and problem solving teacher workshop held on the campus of Southwest Texas State University in the summer of 1988. The workshop focused on the integration of Logo-based lessons in the elementary mathematics curriculum.

The Elementary Logo Mathematics Project was a collaborative effort of members of the departments of Mathematics, Computer Science, and Curriculum and Instruction of Southwest Texas State University and the Comal and Hays School Districts to provide a two week summer workshop for rural elementary teachers in the areas of mathematics and problem solving. The project was funded by a Texas Higher Education Board EESA Title II grant.

The overall goal of the project was to prepare elementary teachers to improve and expand instruction in Mathematics and Science by the integration of LOGO based problem solving lessons into their grade level mathematics and science curricula. Project participants were trained to: 1) Plan, develop, write, and execute computer programs written in the LOGO programming language ; 2) Generate lesson plans for mathematics and science essential elements which utilize the LOGO programming language within their classrooms ; and 3) Implement LOGO based problem solving lessons into their grade level mathematics and science curricula.

Problem solving has been identified by the National Council of Teachers of Mathematics as one of the primary goals of school mathematics instruction. Yet elementary teachers receive little training, in this critical area of mathematics, and few resources for the teaching of problem solving are available to elementary teachers. Elementary mathematics textbooks are severely deficient in presenting problems at the upper end of the cognitive scale. Thus there is a strong need for training and resource materials for the teaching of problem solving in the elementary grades.

The LOGO programming language is an ideal environment for teaching problem solving skills. The LOGO programming language was specifically designed to provide problem solving experiences for children. Developed by Seymour Papert, a student of Piaget, LOGO is pedagogically sound for an

elementary student's stage of cognitive development. The syntax of the language is quickly mastered, while, at the same time, the language will grow with the user, providing an open-ended environment for learning. In addition, LOGO is highly motivating for students and encourages a socially reflective and interactive environment. LOGO is a visual, graphically-oriented language. This visual, rather than verbal approach, makes LOGO particularly well suited for students with poor language skills. The process of problem solving with the LOGO programming language encourages group interaction and socialization that is beneficial in language acquisition and in improvement of interpersonal communication skills. In the LOGO language, a 'turtle' is programmed to move through a 2-dimensional world in such a way as to solve a specified problem. As such, LOGO is extremely well-suited for the essential elements of the elementary mathematics curriculum.

Whereas LOGO software is widely available in elementary schools in Texas, few elementary teachers have received training in the LOGO language and its application to mathematics and problem solving. Traditionally, LOGO has been used with a discovery learning approach with little direct intervention by the teacher. Recent research has shown that the discovery learning approach does not produce sufficient mastery of LOGO to allow transfer of acquired problem solving skills to general thinking and learning skills. Instead, what is needed is a more structured, tutorial approach to the learning and application of LOGO by students. The project provided teachers with the skills to develop and implement programs that allow students to improve their mastery of mathematics essential elements, and improve higher level problem solving skills. Research has also shown that LOGO programming results in significant metacognitive development that transfers to other disciplines. Thus the project represents an innovative approach to the integration of essential element mastery and general metacognitive development.

The two-week workshop was held on the campus of Southwest Texas State University, August 1 - 12, 1988. Sixteen elementary teachers from the Hays Consolidated and Comal Independent School Districts attended the workshop. The three workshop instructors were faculty members in the departments of Computer Science, Curriculum and Instruction, and Mathematics at Southwest Texas. Presentations covered the topics of mathematical concepts in the elementary mathematics essential elements, problem solving strategies, and Logo language programming. The presentations were designed to integrate these three areas. Teachers participating in the workshop examined sample Logo lesson plans which explored various mathematical concepts and problem solving strategies. In the final week, participants created lesson plans appropriate to their grade level and needs, and taught the lessons to the other participants. Using the feedback received, the lesson plans were then modified or refined. The collected lesson plans have been compiled and published, and copies of the lesson plans may be obtained by contacting the project director, Jeffrey A. Slomka, at the address above.

Looking Into Alternatives For Labs

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This presentation will feature alternatives that many districts have found to be feasible when addressing the needs of their students and staff through a computer lab. Through the use of slides and appropriate handouts, specific solutions will be shown that have been effective for the district in which they were implemented.

As technology advances, so must the use of technology advance in today's schools. Many districts are investigating the need for additional means of giving students and staff access to technology. An alternative that many districts turn to is the addition of one or more computer labs. This decision (to add computer labs) is often an expensive one for districts to make. Therefore extensive planning for the most effective use of the lab is necessary.

A systematic approach is necessary if a computer lab is to be an effective instructional tool within a school setting. One of the first steps a district must make is to develop a philosophy for the use of technology within the district. A specific need or needs must be identified. Goals, objectives can then be determined to address the needs of the district.

Once the decision to create a "computer lab" to address the identified needs has been made, the "real" work is just beginning. Many alternatives in many areas exists. Some of these areas include:

- type of lab (CMI, CAI, ect.)
- type of technologies (CD-ROM, telecommuncations, video disks, ect.)
- physical design (room, furniture, wiring, ect.)
- staffing (certified teacher, paraprofessionals)
- scheduling
- funding
- training (staff, students)

This presentation will address these and other areas with possible solutions that different districts have developed.

Using Databases and Spreadsheets for
Teaching Higher Order Thinking Skills

Cathy K. Smith
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Two of the most power:'ul tools for the development of higher order thinking skills are databases and spreadsheets. There are many commercially available database and spreadsheet packages available. This session will review some of these along with some examples of teacher developed activities for the incorporation of higher order thinking skills into various content areas.

The teaching of higher order (critical) thinking skills has come to the forefront in many recent educational reports. Texas, along with other states, has mandated the inclusion of these skills into the curriculum. Many administrators and teachers are turning to the computer as a possible aid in this area.

While the computer is not a "solve all", properly used, the computer can be a feasible alternative in the incorporation of higher order thinking skills into the curriculum. The use of databases and spreadsheets can encourage the development of higher order thinking skills in students.

Simply exposing the students to these tools does not guarantee the development of higher order thinking skills. The teacher needs to guide the students in the development of these skills. Some suggestions for the successful use of data bases and spreadsheets include:
- use of manipulative or concrete models prior to computer
- use of pre-constructed data bases and spreadsheets prior to user constructed
- use of organization techniques
- use of keywords
- careful use of instructions aimed at higher order thinking skills
- prior to computer discussions
- post computer debriefing

The use of data bases and spreadsheets are applicable to most all content areas. The abilities of individual students wi'l vary. Most students can easily manipulate data base and spreadsheets by the time the reach the seventh grade. Both data bases and spreadsheets contain the possibility of being powerful tools for both the teacher and student in the area of higher order thinking skills.

MUPPET SLATE in the Classroom:
Word Processing for Primary

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Involving students in the K-2 classroom with computers and word processing can be a productive and rewarding experience. This session will present examples and a discussion of a word processing curriculum being used in the K-2 classrooms in Temple I.S.D. Included will be ideas for developing and incorporating word processing into a whole language program or other writing/language arts program.

Word processing adds a creative avenue to the programs students tend to use at the K-2 level. Using computers for writing enables the student to concentrate on the content of the composition rather than the motor skills required to put it on paper. Although most students lack good keyboarding skills in K-2, as y increase in letter recognition, the ability to locate the needed letter for each word also increases. For most students, this is still faster than the labor required to produce a paper by hand. Learning to write and think becomes easier and more enjoyable.

A teacher modeling the use of a word processing program for dictated stories is a good way to begin for young students. The fun and colorful program, MUPPET SLATE, offers possibilities for Rebus stories, illustrated stories, and hard copies complete with borders. Ideas for these as well as teacher utilities will be presented for integration in the classroom using the computer keyboard rather than the MUPPET LEARNING KEYS.

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dBASEIII+ — PROGRAMMING FOR NOW AND THEN

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High school students need to learn all the steps to writing good programs using a good programming language.

dBASEIII+ takes students from the beginning of program creation using relevant situations to them NOW and THEN moving into complex business applications from actual companies in the Houston area. This can be done with top down design.

In my Business Computer Programming classes, I was searching for a programming language that

1. would prepare students for either the marketplace or for advanced study,
2. was relevant in the marketplace,
3. would develop a saleable skill for my students,
4. used all the logic of any programming language, plus applicable flowcharting and pseudocoding,
5. allowed up-to-date data entry and data manipulation,
6. could access several databases in one program,
7. could interface with other languages, and
8. could be used practically while the learning processes were taking place.

I found dBASEIII+ to be this programming language. This software has almost unlimited uses and creativity is limitless for the applications programming.

Students have no trouble understanding databases or th necessity for accuracy plus data entry and editing are not so complicated as to take away from programming time.

Batch command files (programs) can perform an entire application or only part of the application. Batch processing has been used for a long time on larger computers. With dBASEIII+ batch processing you have a highly sophisticated computer language for developing database management applications.

dBASEIII+ allows top down programming and emphasizes block diagrams, flowcharts and pseudocode. All the steps of any programming language are covered in dBASEIII+. These are:

1. Identifying the purpose of the program.
2. Identifying the system functions.
3. Understanding user needs.
4. Defining the file structure(s).
5. Writing tne pseucode for the program.
6. Using top-down program and modular design.
7. Creating diagrams and flowcharts.
8. Writing program code.
9. Testing application.
10. Improving the application performance.

Students can write beginning programs that are applicable to their school setting and then expand on these and move on to actual business applications from real business situations. Of course, the more time spent on writing programs, the more proficient students become.

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TURBO PASCAL GRAPHICS
A Motivational Tool to Reinforce "Pre-procedure" Pascal

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ABSTRACT OF PRESENTATION

Computer graphics can be used as a motivational tool while teaching beginning programming techniques. Turbo Pascal 3.0 offers a graphic capability that allows a teacher to use this technique while teaching Pascal.

Graphics are a logical tool to choose if a teacher wants to vary his classroom routine and gain students' interest while still reinforcing basic programming concepts. The first two six weeks in an introductory programing class are necessarily involved with proper syntax and very elementary computer programs. Most students see very little relevance in these programming assignments, yet are fascinated by color and animation. Since computer programming is by definition problem-solving on a computer, students receive an enhanced understanding of this concept when they determine their own design, and then program the computer to produce this design. To ensure that students practice the two major beginning topics, repetition and decision making, part of a requirement for the design incorporates these techniques.

A graphics program also gives beginning students an opportunity to produce a relatively lengthy program, so that they begin to develop speedy editing techniques. Many have to do massive block copies, which leads into a need for procedures as a more logical way to draw an object again. This need can be used to introduce procedures as the next topic of study.

Christmas is an appropriate time to present a graphics unit. The students have had time to be introduced to all beginning programming concepts, they have done many small programs, and are ready for something bigger. Christmas pictures provide a jumping-off place for generating ideas for programs.

The unit can be taught and programmed in a two week space of time—two days for the lectures and eight lab days. Some slower students will need afternoon lab time to finish their project.

The two days of lecture are spent on introducing graph modes, palettes, and the syntax of Turbo Pascal graphics. Emphasis is placed on the system-specific nature of graphics, and the broad concepts that apply

to all graphics. Emphasis is placed on the system-specific nature of graphics, and the broad concepts that apply to all graphics. Simple animation is taught using loops, and a play-again option is explained using a repeat-until loop.

The actual assignment describes all requirements. Animation, text, cases, and a "play-again" option are stated as a requirement. A grading scale is supplied with points regulated for workability, documentation, and creativity. Emphasis is placed on keeping a design feasible for the student's current knowledge and time limit.

Teaching computer graphics is a rewarding activity to undertake. The students enjoy it and will remember that part of their course for years while at the same time improving their programming skills.

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PRODUCING *TECHNOLOGY AND EDUCATION TODAY:* A CABLE TV SERIES

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Houston, Texas 77056

Technology and Education Today is a cable television series produced by the Bureau of Technology of the Houston Independent School District (HISD). Its purpose is to provide training for instructional computer applications commonly used in HISD. This presentation describes the design and production of the programs in the series.

Technology and Education Today uses a talk show format to convey its information. The audience watches two interviewers, one male, one female, ask apparently spur-of-the-moment questions of an expert guest. As the guest responds to the questions, cut-away shots or shots of the process or item under discussion are shown. To date, shows have been completed on topics such as technology and special education, maintaining the Apple IIe, Appleworks, and the basics of the Apple IIe.

The talk show format was selected because it requires considerably less production effort than does a fully scripted show. In addition, since actors are not used, the complication of having to obtain and direct talent is removed. Hence, rehearsals are kept to a minimum and the risk of having a show destroyed by "wooden" acting accompanied by weak directing is removed.

However, even in the talk show format, preparation is necessary to produce an acceptable product. A number of steps are taken for each show. First, a topic is selected that can be shown since television is at its best when action is taking place on the screen rather than talk without visual accompaniment. Next a guest is selected who not only is an expert in the topic under discussion but also has good appearance and is highly verbal.

Questions for the script are derived both from the guest and from research by the interviewers. The interviewers also act as the producers of the shows. The questions are placed into logical progression and each interviewer knows in advance which question he or she will be responsible for asking. The guest is aware of the questions in advance but does not necessarily know the order of the questions.

The guest is then rehearsed in the procedures of the show. Topic questions are asked of the guest but the exact questions that will be asked during the taping are avoided. This is done in order to maintain spontaneity. Thus, while the rehearsals remove some of the nervousness and apprehension the guest may feel, care is taken to avoid having the guest recall answers given during rehearsals. Recalled answers are inevitably stilted. Hence, if the questions are not asked during the rehearsals, there can be no straining to recall answers during the taping. The on-screen effect is one of a guest responding with animation to a series of spontaneous questions.

The opening and closing of the show are the responsibilities of the in* rviewer-hosts. These two events are carefully rehearsed in order tc give the show a polished look. During the introduction of the shows, a verbal interplay between the hosts is established and maintained throughout the taping. Interviewers have the option of adding questions to the original list as the taping progresses.

The studio and production crew are provided via the Instructional Media Services of Houston ISD. Before production takes place, meetings are held with the director of the show to establish what, if any, field shooting will be necessary and what studio shots of props will have to take place. A shot list is provided the director so that camera preparations can be made well in advance of the studio production day. Any adjustments to the standard set are also discussed.

Most of the cut-aways to the props, which, of course, are usually computer equipment, are done as the interview is taking place. This means that each show usually has three to four camera operators responding to instructions from the director. Any shots that are missed as the interview progresses are taped at the end of the interview section and edited in later as inserts. This includes the music and titles that open and close each show.

Shows are usually taped in about three hours. An additional work day is necessary to complete the editing of each of the shows. This minimal amount of time is achieved through the detailed prior planning that takes place for each production.

At present, the series Technology and Education Today is seen on Houston ISD's cable TV channel, Region IV's Interact Network, and during technology training sessions held by the Bureau of Technology of HISD.

What You Need to Know to Automate Your School
Hardware and Software

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WHAT YOU NEED TO KNOW TO AUTOMATE YOUR SCHOOL: HARDWARE AND SOFTWARE

WHAT YOU NEED TO KNOW ABOUT HARDWARE AND SOFTWARE.
WHAT COMPRISES A COMPUTER HARDWARE SYSTEM?
  PROCESSOR
  INPUT DEVICES
  STORAGE DEVICES
  COMMUNICATIONS
  OPERATING SYSTEM

WHAT IS INFORMATION SHARING?
  SIZE OF PROCESSORS
  METHODS OF SHARING
  ADVANTAGES OF VARIOUS TYPES OF INFORMATION SHARING

SYSTEMS SOFTWARE AND APPLICATIONS SOFTWARE.
  WHY DO YOU NEED SYSTMES SOFTWARE AND WHAT DOES IT DO?
  WHAT IS APPLICATIONS SOFTWARE?
  EXPLANATION OF INTEGRATED AND MODULARIZED SYSTEMS.

WHY "NOW" IS THE TIME TO LOOK AT COMMERCIALLY AVAILABLE ADMINISTRATIVE
SOFTWARE EVEN IF YOU NEVER HAVE BEFORE.

HOW TO EVALUATE WHAT IS RIGHT FOR YOUR SCHOOL.
  NETWORKS VS: DECENTRALIZED SYSTEMS
  CENTRALIZED VS: DECENTRALIZED SYSTEMS
  VARIETY OF HARDWARE TO DO DIFFERENT JOBS

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          EASE OF USE
          FLEXIBILITY
          MULTI_USER MULTI_TASKING
          REPORTING CAPABILITIES
          PERIPHERALS: SCANNERS, AUTODIALERS
          CONTROL OF JOBS LIKE ROUTING TO PRINTERS
          MARKET ENHANCEMENTS
          PRICE BASED ON STRENGTHS



SPECIFIC EVALUATION OF SOFTWARE
   FINANCIAL SOFTWARE
      SPECIFIC FEATURES
      PEIMS PRODUCT

   STUDENT SOFTWARE
      SPECIFIC FEATURES
      TEA REQUIREMENTS

   FUTURISTIC APPLICATIONS AVAILABLE NOW
      INSTRUCTIONAL SUPPORT SYSTEMS
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TEA-NET: An Electronic Highway
Current Administrative and Instructional Applications

Connie Stout, Texas Education Agency
Ed Franz, Judson ISD
Linda Paschal, North East ISD

For the past year the Texas Education Agency worked closely with Judson ISD and North East ISD in the use of an electronic communication network. The feasibility and a plan of implementation of such a network was determined. In addition several administrative and instructional applications were developed and expanded. This paper summarizes the findings of the electronic network. It also describes some of the features and benefits of the Texas Education Agency's electronic network.

During the past year the Texas Education Agency conducted an experimental project to study the results of two school districts using electronic communications for distributing information and messages while eliminating most of the paper distributed among the campuses for these same purposes. The districts, using a state-wide electronic mail, bulletin board, and teleconferencing network, were able to communicate with the Agency and other educational and professional entities.

The two school districts involved in the project were North East ISD and Judson ISD. Both districts are located in the San Antonio area. North East ISD has 41 campuses with about 38,000 students. Judson ISD has 15 campuses and an average Daily Attendance (ADA) of about 12,000 students. In September personnel from TEA and National Information Systems, Inc. visited the model districts and talked to superintendents, coordinators, and teachers to determine their experiences, attitudes, and recommendations about using the district electronic network to communicate within their districts and to communicate with other districts through the state. Based on their feedback, a model implementation plan was designed to be used by other districts that are considering implementing such a district-wide network.

The electronic network is configured to handle the volume that would be demanded by the approximate 1100 districts in Texas. Each district has access to a local network "host" machine that is updated daily from the State's central host by placing a call to the central host. This "update" procedure transfers any additions or deletions from on-line databases in TEA-NET and all mail bound for users of the local system. Local users are able to call the local network "host" which provides local networking services such as mail and bulletin board information. The result is that administrators, teachers, and students have access to on-line time without incurring a connect cost.

The feedback from the two model districts suggested that the project put the administration on-line with technology. Although some of the initial reaction was negative, the attitude to the project was positive by the end of the year. One principal at an elementary school said that he felt it was a way for teachers to be part of the mainstream of education in Texas. They were particularly thrilled to read the full text of a speech Dr. W. N. Kirby had given the previous day. The positive reaction of each district was due to high level of commitment to technology.

Another reason for the positive reactions was the training and support given. The training was different in each district. North East ISD had a training session that involved six hours of initial training. An additional nine hours of training was offered during the summer for those who wanted to learn to integrate word processing into telecommunication and on-line skills.

District-wide communication was seen to be more effective and one additional positive result was seen when telecommunications "spilled" into the curriculum. Because a technical assistance person was needed on each campus, the computer literacy and computer science teachers in North East ISD were trained to use the technology. The teachers had an over overwhelmingly positive response. These teachers felt the "local host" was imperative for the use of telecommunications within a district. Computer literacy students used the technology by maintaining a bulletin board on the local host. The "sysop" function was switched from school to school on a monthly basis. Once a month the teachers met to work on telecommunication projects. During the past summer, the teachers meet to develop ways to integrate telecommunications into the computer literacy curriculum.

Although existing equipment was used, additional funds were needed to update some computers. Insufficient equipment was viewed as a problem. In addition, the turnover of operators was a problem. This only emphasized the need for continual training.

Another of the major benefits both districts founds was that, for the first time, administrators wanted to use a computer and wanted a computer on their desk. Using a computer to communicate with their peers gave principals and central office administrators the incentive to begin learning to use the computer for word processing and spreadsheet applications as well. Before the telecommunications network, both districts had difficulty in getting administrators to use computers. An additional benefit was potential time savings noted by administrators. These savings were seen in as memo transfer, elimination of telephone tag, tracking maintenance records, processing work orders and personnel services.

Some of the recommendations given by North East ISD and Judson ISD included :1) require a minimum of twelve hours of telecommunication awareness; 2) require a contact person for each campus to serve in a support role; 3) require a district-wide adoption of a word processor to ease the support of file transfer functions; 4) train central office personnel first; 5) make the use of electronic mail mandatory; 6) develop a network version to save on modems; and 7) add one person to develop the applications to be used with the telecommunications system.

The Challenges of Integrating Technology into the Curriculum: Ten Tips for Long-Range Planning

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Seven years ago Houston ISD established a centralized department to coordinate its technology efforts. This session will focus on some of the innovative programs we've tried, the staff development strategies that have been successfully designed to support curriculum integration, and the lessons we've learned in trying to create a district-wide vision for change. Ten important technology and education trends (with implications for long-range planners) will be presented with an eye toward how to develop contingency plans for an uncertain future.

Only when you take risks do you learn what you can do to improve. Houston ISD has been willing to take calculated risks in launching innovations that some said would never work. These include programs like *Computers Can,* a home computer check-out program, *CompuBuy,* a software library for parents, *Techmobile,* a traveling technology lab, and *E-Net,* a district wide telecommunications network. Most of these programs were first implemented on a small scale and then expanded across the district. Some efforts have been extremely well received like the district's development and implementation (230 schools) of its own reading/language arts software (*FunReader,* 38 disks) while others have faltered. For example, technology magnet schools (200+ computers per campus) have captured the enthusiastic interest of students, but finding and retaining qualified staff and updating obsolete hardware have been formidable obstacles in implementing these computer intensive programs.

Houston has launched new technology initiatives that support the curriculum and administration through both top-down and bottom-up planning strategies. The learning curve has increased dramatically as more teachers become trained in using technology in their classrooms. (Houston has an in-house team of trainers who provide a 296-hour training program for teachers.) As staff sophistication increases, teachers want to create their own plans for using technology and are less interested in receiving "structured configurations" from the central office. Labs continue to provide for greater efficiency, but many teachers are wanting access to computers in their own classrooms, particularly to improve their own productivity.

With approximately 13,000 microcomputers now in use, it is becoming increasingly more challenging to determine which software should be purchased and how to best support it. Even for a large urban district, it's difficult to evaluate and disseminate the many programs that continue to flood the market. A wide variety of incentives

have been developed so that administrators and teachers can help review the programs; the district wants to ensure that teachers are using "only the best." There is still much work to be done.

Houston's technology staff includes experts in strategic planning, implementation support, courseware development, hardware procurement, software evaluation, computer maintenance, telecommunications/networking and video production. Yet, despite this array of experts, the district faces the difficult prospect of planning for dozens of contingencies that may or may not materialize -- all in an uncertain budget climate.

These particular technology trends are worth tracking as they impact planning efforts. They must always be juxtaposed with important educational trends that are likely to create new opportunities for using interactive learning devices. This presentation will expound on these ten trends:

- **Networking...** determining the cost benefits baselines that will justify their use.
- **Optical disc-based software...** sorting out the formats -- CDI, CD-ROM XA, ADPCM, and CDV.
- **Computer manipulated speech...** exploiting the potential and surviving the compatibility headaches.
- **Telecommunications...** developing applications that aren't expensive boondoggles.
- **Bus wars...** procuring hardware and fighting the retrenchment blues.
- **Integrated learning systems...** juggling system selection and accommodating accountability pressures.
- **"Restructuring" reform movement...** saying we are when we really might not be.
- **Family support programs...** determining how and what technology is appropriate.
- **TASP - type testing...** breathing life into competency-based education with computer support.
- **Curricular efforts to promote collaborative learning...** using interactive devices to ensure skills of cooperation, compromise and decision making.

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Emerging Convergence: New Directions Serving Regular and Special Education Through Technology

Christy Sutton, Joan Martinez, Cheryl Allen, and Debra
Washington, Educators
Dallas Independent School District

Dallas I. S. D. has started a joint reading improvement
project involving both special education and regular
education students using the regular reading improvement
curriculum and an ICON network with the Autoskill Component
Reading Subskills Program.

A special project in reading is being implemented this
year in two D. I. S. D. middle schools at the seventh grade
level. It will be a two year study to prove that both
special education and regular education students can make
substantial reading gains when reading automaticity training
and basic comprehension skills are emphasized over a two
year time span.

Under the direction of Dr. Ruth Turner, Executive
Director of Special Education, Don Hawkins, analyst, and
Jeri Hodges, technology specialist, for the Department of
Special Education in Dallas I. S. D. searched for a reading
program in software format that would address the
individualized needs for special education's reading
disabled population in Dallas. They found encouraging
results reported from Canada in Dr. Christina A. M.
Fiedorowicz's study using computers to train reading
disabled students in the oral, intermodal- associative, and
sequential subtypes. The software, Autoskill Component
Reading Subskills Program, that Dr. Fiedorowicz and Dr.
Ronald Trites developed was found to be available for use on
the UNISYS ICON network.

According to the results shown using the Autoskill
training, an impressive one to four years reading increase
for every twenty hours on the program, Dallas decided to set
up a trial lab to evaluate the software and hardware in a
high school resource room with six special education
students. After the trial lab of one month, the software
was evaluated to have significant value training the

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automaticity that reading requires prior to higher
comprehension skills. The hardware was found to be easily
used by the students.

Regular education, being impressed by the reading gains
that Autoskill has shown, entered on the joint venture with
special education in the funding for the two reading labs
now established at O. W. Holmes Middle School/ Academy and
at Boude Storey Middle School in Dallas. The schools were
selected because of their representative minority student
populations. The training has just passed the first twenty
hours mark. We are beginning to see better automaticity in
our students' reading skills.

Our presentation will include an overview of our
program. Our staffing requirements, student selection
criteria, room arrangements, materials, methodologies, and
student incentives will be discussed. An overhead
presentation will include percentages of gains shown in the
Canadian studies. Handouts and an Autoskill workstation
will be available for participants. A question and answer
session will be following our presentation.

OVERVIEW OF USE OF COMPUTERS IN FIRST GRADE BASIC SKILLS

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Houston, Texas 77070

This presentation will focus on the manner in which one school used computers to provide an effective, simple method to provide reinforcement of basic skills.

Practice and reinforcement of basic skills is one of the most important aspects of teaching at the primary level where skill acquisition constitutes the major part of learning, considering the limitation of teacher time and demands made on that time, adequate reinforcement is difficult to plan into the day. In order to meet this need in an effective, useful way many schools are turning to computers.

This presentation will focus on one school's program. It will offer a way to set up a computer lab in a closed or open area setting. Use of software for keyboarding, reading readiness, reading, math, language and creative writing skills will be discussed, as well as the evaluative procedure used and the significant outcomes of the program.

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COMPUTERS AND ADULT EDUCATION

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        The effective teaching of computer users classes for
adults in Word Processing, Data Bases, Spreadsheets, and publish-
ing software will be discussed. An appropriate laboratory layout
will be shown, in conjuction with samples of software and activi-
ties taught. Other software will be shown to enhance the GED pro-
gram and Amnesty program taught in adult classes.

        Many problems exist in teaching computer users classes
to adults. Adults initially have a great fear of the computer and
the technology associated with the computer. As a result of this
problem, it is extremely important to be relaxed, low key, self-
confident of what the teacher is doing. Also, I have found that
teaching without the use of a manual of textbook seems to relax
students much more than trying to appear organized with book in
hand. Another problem is lack of knowledge of computer termino-
logy. The purpose of the class is thoroughly discussed as well as
all vocabulary relative to the software and laboratory are
discussed. Hand outs are given each class meeting so as to explain
terminology and the activity to be done that class period.
        Adult Education also includes teaching the GED and
Amnesty classes at Joaquin High School, Joaquin Independent School
District. GED classes are taught in a regular classroom setting.
The computer laboratory is used as a supplemental-reinforcement
activity for the basic skills objectives needed in Mathematics,
Reading, Language Arts, Science, and Social Studies. Software use
and selection will be discussed. Over one-third of the enrolled
students in GED classes at Joaquin High School graduated within the
eight-month time of enrollment date to graduation.
        Amnesty classes are also taught in the Joaquin Indepen-
dent School District. The reading, writing, speaking, and under-
standing of English as a second language is taught. The computer
laboratory is used extensively in developing and improving reading
and comprehension skills, particularly those students that have
developed these English skills at or above the third grade levelof
English.
        As one can readily see, Adult Education and the Computer
can go hand-in-hand.

LAPTOP VS DESKTOP FOR EDUCATION

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ABSTRACT:

School personnel should consider the laptop alternative to the installation of a desktop laboratory. This presentation will include: categories of portables, brief history of portable development, factors in laptop selection, laptop accessories, laptop communication, CRT vs flat screen technologies, advantages and disadvantages of laptops in the educational environment, and an educational buyer's guide to laptops.

ARE LAPTOPS A VIABLE ALTERNATIVE IN EDUCATION?

School administrators should consider the laptop alternative to the installation of a desktop laboratory. At Hillsborough Community College in Tampa, Florida, a portable laptop laboratory was purchased to allow instruction and hands-on demonstrations off campus into the community. The presenter has had terrific success at elementary and junior high visitations with the laptop lab. Using the trunk of his car, the presenter has transported 20 stations and an LCD overhead projection device to the schools for demonstration. With student help, the lab has moved from class to class at the schools within the normal hourly time schedules. Special teachers in music, physical education, etc. move daily from school to school -- why not move computer educators with a portable lab from room to room, school to school?

Most laptop equipment is built for the MS-DOS (IBM) environment. Since many school systems have already invested in the Apple equipment, to match the Apples with IBM-compatibles would be cost-prohibitive. Those schools and/or school systems could invest in one MS-DOS portable laboratory to provide student contact with the IBM world.

The first successful portable (suitcase type) computer was the 23-pound Osborne I that appeared in 1979. Since then, three categories of portables have emerged: transportables, laptops, and handheld. By 1982, the Osborne had 22 transportable competitors, ranging in price from $899 to $9,370. While transportables were using smaller than six-inch cathode ray tubes (CRT) displays, the LCD (liquid crystal display) screen technology improved by 1987 such that people accepted the laptop as a viable, lighter alternative. Today's user is demanding faster-brighter-smaller portables. In 1988, one out of twenty units sold was a laptop.

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A CRT display has a range of a 15:1 to 20:1 screen contrast ratio (SCR). Before 1987, the standard LCD in a laptop had only a 3:1 SCR. Backlit LCD's improved the readability to a 7:1 SCR. In early 1987, Zenith introduced the supertwisted backlit LCD with a 12:1 SCR which began the laptop boom. New vocabulary emerged, such as El-electroluminescent, backlit, gas plasma, and supertwist.

Some of the other major disadvantages of the laptops, in addition to poor screen displays, are: short battery life, 3½ inch storage media, and cramped keyboards. Educators should investigate the battery-life of the unit to be purchased. Supertwisting and backliting the LCD reduced the battery life from 20 hours to 2 to 4 hours. The 3½ inch storage media hassles in data transfers from 5½ media may be conquered by either purchasing a 5½ external drive ($180-$260) or purchasing a good communication package, such as Laplink or Brooklyn Bridge for $80 to $120.

Educators must decide whether the poorly-designed, cramped keyboard in some models with super screen displays outweigh improved layouts of other models with poor screen output.

Today's machines are capable of only CGA graphics, at best. EGA resolutions should emerge in 1989 or 1990 on higher priced portables.

The long list of accessories could drive up the educator's price for the laptop: internal modem, memory expansion, internal and/or external hard disk, external 5½ drives, travel case, car battery adapter, external battery pack, AC adaptor, null modem cable with software, portable printer, 3½ drive for desktop, numeric keypad, and math coprocessor.

A buyer's guide, including latest educational discount, will be included in a handout booklet of information given to each participant. Vendors will be requested to loan various laptops for the presentation to allow direct comparison of makes and models.

The future will see the development of lower priced, high speed 80386 machines with EGA graphics and possibly LCD color screens. Also, many educators wish Apple would produce a laptop computer for the IIe/g and MacIntosh.

Today's business executives are frequently seen traveling with the newer-lighter-brighter Intel 80286 or 80386 top-of-the-line laptops introduced in 1988 with price tags of $2,500 to $9,000. Educators need to think about the lower priced product ($800 to $1,500 per unit) for the school systems.

Minimum specifications for schools should include dual 3½ disk drives, 640K ram, a lightweight unit with backlit supertwisted displays to establish a portable lab.

One bonus of a school portable lab is that faculty could check out the laptops at night for school preparations and usages, while the students use the lab during the day.

MAGIC CHARACTERS GAME

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ABSTRACT:

The presenter will demonstrate, by interaction with the audience, five Magic Number Games and a keyboard character game written in Turbo Pascal 5.0 which will introduce how a computer works using the binary number system. The presenter acts as a human computer, processing up to eight bits of information to identify a selected number or keyboard character. Interactive tutorial explanation and lessons follow each game. This program has been used with grades 3-12, as well as college students, to introduce computers from either a lecture/demo or hands-on approach.

INTRODUCTION TO COMPUTERS BY AN ALTERNATE APPROACH:

How do educators introduce computers to an audience of beginners, young or old, elementary grades or college students, or even retired folks? Most textbooks and many teachers with chalk or overhead transparencies show the following diagram in their opening remarks:

Input $\longrightarrow$ | Computer | Output $\longrightarrow$
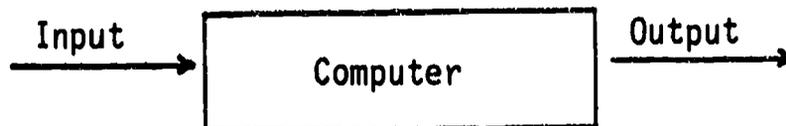
This is fine for a traditional approach. However, the presenter remembers his college theater appreciation class 30 years ago when we all sat in the room the first day waiting for the instructor and two students carried into the roo⌐ an apparent limp (dead) body. They threw the body onto the desk. The ly (the teacher) came to life with a dynamic monolog script. He got ὐ., attention (Gayne' Principle) and the class began with an attentive, enthusiastic group. Computing may not be as dramatic but can be even more exciting.

To get their attention the first day, the teacher becomes a magician. A participant thinks of a number within a specific range. He/she reviews screens of arrays of numbers identifying the presence or absence of the mystery number. Then the presenter accurately guesses the number, to the amazement of the participants. Depending on the ages or sophistication of the audience, up to five different number games (15, 31, 63, 127, or 255) may be performed. The final game identifies any keyboard character (letter, number, or symbol) selected by the participant.

Magic Characters Game, Continued

This distinguishes lighter character keys from the darker function/control keys on a typical computer keyboard.

Player error procedures are included for participant's incorrect responses.

These games relate the concept of how switches (computer circuits) identify an "a" from an "A" from an input device, such as a keyboard, and the relationship of ASC II code to the binary number system distinguishing a bit from a byte.

The program also has interactive tutorial explanations and lessons that follow each game. This program may be either presented as a lecture/demo or from a hands-on approach.

The program has been written in Turbo Pascal 5.0 for MS-DOS microcomputers, as well as VAX-Pascal for Digital mini-computer systems. Apple IIe and MacIntosh versions are presently being prepared and may be available by the conference presentation.

Graphic displays do not require special graphic boards.

Copies of the program will be made available to audience participants for their own classroom use as long as they agree to act as reviewers.

Those who did not attend may write the presenter at the above address to become a reviewer.

Sample Game of Fifteen:

I am thinking of a number from one to fifteen!

It appears on the following screens:

Screen 1:	Screen 2:	Screen 3:	Screen 4:
3 9 10	4 5 6	2 3 6	1 3 5
11 12 13	7 12 13	7 10 11	7 9 11
14 15	14 15	14 15	13 15
Yes	No	Yes	Yes

What is my number?

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TEACHER'S GPA - THE SUCCESS RATIO PROFILE (THE SRP)

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ABSTRACT:

The presenters will demonstrate special software programs used to aid administration at Hillsborough Community College in Tampa, Florida to evaluate faculty. Paradox, Pascal, C, $SPSS_X$ and an Expert Systems Shell are combined to assign a SRP (Success Ratio Profile) to each faculty member (a teacher's GPA).

CAN THE FACULTY EVALUATION PROCESS BE IMPROVED BY USING THE MICROCOMPUTER?

Faculty evaluation is one of the most difficult tasks of administration. Annual contract renewal and tenure considerations are usually determined by the supervisor's evaluation. At schools where pay and/or merit is linked to evaluation, academic bloodshed often occurs. The life and death of a teacher is sometimes determined by a purely subjective evaluation by administration without consideration of data which might be available.

Many administrators quantify subjective information in order to make their decisions. In some college settings, only student evaluations are considered which is often a popularity contest. Other college settings, tenure is determined by peer vote. Many principals in K-12 and college administrators measure teacher success by the number of parent or student complaints. Many times, administrators view "no news as good news." Many educators, especially those tenured, resent 'constructive' criticisms of their teaching and are unwilling to attempt improvement. How can faculty evaluations approach a degree of fairness?

At Hillsborough Community College (HCC) in Tampa, Florida, faculty evaluations have evolved through a twenty-year history that, for the last nine years, has been determined by a Union Contract. Presently at HCC, student evaluations are conducted only for adjunct faculty. All faculty are formally observed one to three times a year by their supervisor, identifying only teaching strengths and weaknesses.

John Taylor, the Director of Mathematics/Science Division, has been working on a five-year project to produce a more objective evaluation of his 40 full-time and 60 adjunct faculty in six disciplines, including 92 courses. Mr. Tim Totten, copresenter and Professor of Computer Science, has been assisting the Director with technical aspects of the programming and interfacing of the programs.

The presenters believe that evaluation should be based on productivity of the faculty, rather than popularity. Productivity is difficult to measure fairly. At the university level, productivity is dependent on research and publications, rather than quality of teaching. Community colleges are teaching institutions and productivity may be linked to student success. Success may be defined as those students who achieve an A, B, or C final grade outcome, verified by a passing score on the departmental comprehensive final examination.

Two years of success data has been collected from 1986 through 1988. In 1986-87, this data was entered into a BASIC program which emulated a data manager. Then, in 1987-88, due to the size of the data, the success outcomes were manipulated using Quattro Spreadsheets. During the Fall of 1988, the data was transferred to the microcomputer data base, Paradox. The Division's 80386 micro has been connected to the IBM mainframe of the college to provide a more rapid input of the grade outcomes after the completion of the semester into the Paradox data base.

A faculty member's success is compared to the mean of all sections of the same course taught the previous two years, using a statistics software package, $SPSS_x$. Normal outcomes are those that fall within one standard deviation of the mean. Above average results are those outcomes between one and two standard deviation units above the mean. Below average is between a minus one and minus two units. Excellent and unacceptable results are two standard deviation units away from the mean. The standard deviation is adjusted for the correlation between outcomes and those passing the final. This adjusted number is the faculty member's SRP, similar to a student's GPA. This year will be the first year the SRP data will be attached to the faculty's evaluation. Next year, improvements in the SRP will be available for the evaluation. By the fifth year, 1990-91, decisions concerning tenure, as well as contract renewals, may be implemented.

Two years ago, Mr. Totten wrote a program to analyze student evaluations. Again, comparisons are made to all sections of the same course, in addition to the total department. Measurements are compared to the means using standard deviations.

The total evaluation of each faculty member includes the SRP, student evaluations of adjunct, classroom observations, self-evaluations, service to the college and community, and personal growth. A program in an Expert System Shell is now being developed to attempt to quantify the total evaluations. It may be functional by the conference date and should be capable of weighing each area of evaluation.

Sample handouts will be provided of the computer program printouts, as well as the evaluation questionnaires.

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JOB READINESS AND JOB SUCCESS

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The use of computers in working with today's entering work force.   The material is designed to help prepare students for those first important jobs. Useful with vocational students, adult education, and the at-risk population.

The first title in the series: JOB ATTITUDES: ASSESSMENT AND IMPROVEMENT assesses attitudes in familiar situations, discusses attitudes appropriate to the vast majority of employment situations, and assesses student attitudes as they relate to job situations.   The focus is on four attitudes of primary importance to job success: confidence, cooperation, motivation, and responsibility.   The pretest increases the student's awareness of attitudes influencing his or her behavior by using situations a non-employed student will understand.   The optional printout shows where·he/she needs work and directs them to the program segment.

FILLING OUT JOB APPLICATIONS.   This program takes the student through the process of filling out a job application form.   Each section of the application is discussed and examples of appropriate answers are given.   The student's responses are continually stored and appear on the application/printout which is available following the running of the program.

SUCCESSFUL JOB INTERVIEWING.   Students are shown how to conduct themselves during the job interviewing process.   Students use the program to discuss how to prepare for interviews, problems encountered during the process, ways of handling tough questions, and how to follow-up the interview so as to maximize their chances of becoming employed.   SUCCESSFUL JOB INTERVIEWING is written with a low vocabulary but with interest level appropriate for teens and adults seeking a job.   This program is divided into three segments, each of which takes 15 to 30 minutes to run.   It is possible to sequentially run the entire program or the student may see or rerun a single segment as desired.

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RESUMES MADE EASY. This program provides an interactive
discussion covering what a resume is, how a resume is prepared,
what to include in a resume, and the two most common types of
resumes. Each section of the resume is discussed and examples
of appropriate answers are given. Student responses are stored
and appear on the resume/printout which is available following
the running of the program.

Ten Terrific Software Tools for Teachers:
Using software to generate instructional materials

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ABSTRACT

This session will present ideas for using print and graphic
utilities to develop teaching materials. A resource booklet
including step-by-step instructions for using each tool, examples
of computer-generated screen and print materials, and ideas for
development of instructional materials in a variety of subject
areas will be distributed. Selected software tools will be
demonstrated and printed materials exhibited.

COMMENTARY

Current literature describing the use of computers in
educational settings supports the premise that to effectively use
computer-based technologies in instruction, teachers should
complete computer education coursework preparing them (1) to
teach topics typically encompassed in computer literacy classes
and (2) to use microcomputers to enhance the delivery of the K-12
curriculum in the subject areas. Such training should result in
the infusion of the computer-based activities as an integral part
of the instructional process.

Using the computer to assist in the delivery of the K-12
curriculum requires that teachers develop basic competencies in
(1) manipulating the hardware and selecting useful software; (2)
applying software within the subject areas; and (3) using software
to develop teaching materials and manage instruction. Competencies
1 and 2 are often developed through computer literacy training,
but often competency 3 is neglected. Teachers should be given the
opportunity to be knowledgeable of the tool programs available as
aids to instruction and have opportunities to apply these
utilities to create materials for instruction or to manage data.

Preservice and inservice teachers enrolled in the computing
methods course at Louisiana Tech University are required to
develop instructional units which include traditional and
computer-based activities. Several commercial software tools have
surfaced as particularly useful for developing such instructional
materials. Such utilities intended by their developers to serve
the home market, can be used in creative ways to generate
attractive and useful instructional materials.

There are many software tools for developing computer-based
and print-based instructional materials. The ten general types

used in the computing methods course to generate instructional materials and manage data are:

1. Print graphics utilities
2. Cartoon printers
3. Graph generating software
4. Word processors with a variety of fonts, styles, and sizes
5. Drawing programs
6. Certificate or awards makers
7. Test-generating utilities
8. Puzzle makers
9. Screen graphics generating packages
10. Computer-based activity models

A resource booklet which includes step-by-step instructions for using each tool, examples of computer-generated print and computer-based materials, and ideas for development of materials in a variety of subject areas has been compiled. These materials have been used successfully in several teacher training situations. Preservice teachers who are beginning computer users, have used them in small groups and individually; graduate students and inservice teachers have used them in the computing methods course; and teacher educators have used them in a training program designed to teach them how to incorporate computer skills in their methods courses.

METHODS OF IMPLEMENTATION

When working with a classroom of beginning users, place students in groups of 2 or 3, and have one student read the instructions while the other enters the keystrokes on the keyboard. By the time the second and third persons get their turn at the keyboard, they have developed enough confidence to be creative and stray from the written instructions. Then the group moves to another station in the room to use the next type of utliity software.

To create the training materials, follow these steps: (1) use a utility to develop some instructional aid; (2) record every keystroke needed to complete the item; (3) type (word process) a list of the keystrokes; and (4) test the instructions with a beginning user to see if all directions necessary for making a duplicate of the example have been included. This may seem to be a very simple idea, but a valuable one in that the use of these materials greatly increases students' abilities to learn to use the utilities quickly and allows the instructor the freedom to move about the room and work with special problems that arise.

Users of these materials find it easy to follow the directions for developing a product, and then to modify the steps to create a particular product that suits the instructional needs of their students. Once teachers experience the capabilities and ease of use of the utility programs, it is amazing how many different ways they can think of to apply the utilities in an instructional way.

SOFTWARE APPLICATIONS AND INSTRUCTIONAL STRATEGIES

TO INCREASE STUDENT ACHIEVEMENT

Dr. Barbara H. Thompson
Mrs. Edgel Permenter
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This presentation will introduce Joaquin ISD's BAF ICS Project. The BASICS (Building Academic Skills Through Intervention and Cooperation of Staff) Project is in its third year at Joaquin ISD. BASICS uses the tutorial approach both to teach and to remediate skills in which students are deficient. Students in the BASICS Project are engaged daily in literacy activities while their teacher is presenting lessons to other students.

BASICS instructional program activities integrate curriculum content and computer software. Teachers use current computer technology to teach basic reading, language arts, and math skills to students of varied grade levels. BASICS helps to achieve the following educational goals:

- Enhance vocabulary development
- Increase comprehension
- Develop research skills
- Improve writing skills
- Improve math skills

In addition to achieving these goals, students benefit in several other ways. They increase their knowledge of associated subjects, such as science and social studies. By using computers and computer technology, students become more computer literate. They are also able to develop self-management skills by becoming responsible for their own learning. BASICS saves time and energy for teachers and flows naturally within the structure of the classroom.

The BASICS PROJECT is funded with Vocational 1-2-3 money from Job Training and Partnership Act (JTPA) funds through the Deep East Texas Council of Governments (DETCOG) in Lufkin, Texas. Students who have been identified as at-risk are assigned to the program after meeting JTPA entry criteria. After screening a student's grades, TEAMS scores, achievement test scores, and teacher recommendations, a plan is developed which will remediate math, language arts, and/or reading skills. This example will illustrate how the program works. Mary failed the Exit TEAMS. A review of her test scores revealed that she had not mastered main idea, fact and opinion, capitalization and punctuation. Her Correlated Language Arts (CLA) teacher sent her to the Academic Support Center for detailed tutorials in the areas of need. While Mary was spending time "one-on-one" with the computer and software programs to remediate those language arts skills, her teacher was able to continue working with her remaining students in regular classroom activities. At the end of the tutorial session, Mary returned to her CLA

class with a print-out of her results. The teacher then recorded that score as Mary's daily grade.

The Basics concept has worked extremely well with special education students in resource activities. It seems that the structure incorporated into the software activities is extremely beneficial. The success that our special education students have achieved has been extraordinary. An element not considered in the original proposal, but quite evident in the outcome, has been the rise in self-esteem exhibited by the students. When they began doing things they had observed other students doing on computers, it was obvious that they felt better about themselves. As far as time is concerned, students are basically engaged academically for a greater length of time, and no time is wasted with behavioral/disciplinary type activities. They often have to be reminded that it is time for the bell, or that it has just rung!!!

The software programs used for BASICS students are also available for all students and teachers to use. A software program purchased for use mainly for seventh and eighth grade students might be used as an enrichment activity for fifth or sixth grade students. Several teachers make use of the software programs in this way.

Remember: The computer is very patient. At the end of a 7-period day, it is still rei: forcing desired behavior with "Try again," "Great job," "You did it," "Do this exercise again," etc., just as it did the first period. A teacher who has been remediating students all day long, may not be this patient.

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TITLE: APPLICATIONS OF LOGO AND PROLOG IN ROBOTICS AND PROCESS
         CONTROL

AUTHOR: Gary W. Tubb, Ph.D. Instructional Computing Department
         University of South Florida Tampa, Fl 33620 813/974-3600
         BITNET# DNPABAA at CFRVM

ABSTRACT

The versatility of Lego Logo and Turbo Prolog are used to demonstrate
concepts and examples of robotics and computer process control appropriate
for an upper elementary or middle school applications course.

The versatility of Lego Logo and Turbo Prolog are used to demonstrate
concepts and examples of robotics and computer process control appropriate
for an upper elementary or middle school applications course. Concrete
examples of robotics and automated devices that upper elementary and middle
school children may use to learn about industry and technology will be
demonstrated. Robotic concepts of interrupt, queue, priority request, and
feedback will be discussed. Emphasis will be placed upon relating
computing, mathematics, and science concepts to hands-on robotic
activities.

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TITLE: STANDARDS FOR PLANNING COMPUTING LABORATORIES

AUTHOR: Gary W. Tubb, Ph.D. Instructional Computing Department
           University of South Florida Tampa, Fl   33620 813/974-3600
           BITNET# DNPABAA at CFRVM

ABSTRACT

Hundreds of schools will be built in the United States in the next ten
years. This presentation addresses minimum standards for the construction,
equiping, networking, security, and maintenance of computing laboratories.

Hundreds of schools will be built in the United States in the next ten
years. This presentation addresses minimum standards for the construction,
equiping, networking, security, and maintenance of computing laboratories.
Specific recommendations or. the construction of new computing laboratories
with regards to: location and size of laboratories, electrical power,
cooling, networking chases and ducts, networking cable and connectors,
telephone access to networks, security devices. Particular attention will
be given to computing equipment of the '90s, desks, chairs, access by
handicapped, etc.

EVALUATING SOFTWARE:
AN EDUCATION FOR TEACHER AND STUDENT

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Computer Literacy Teacher
Deerpark Middle School, Round Rock I.S.D.
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Computer literacy teachers can help the movement to integrate the use of computers into all curriculum areas by evaluating educational software as part of the computer literacy course. The unit generates enthusiasm among the students, provides a vehicle for reinforcing many computer skills, and makes available on the campus a sample of software which can spark an interest from fellow teachers.

> Ue have to get [the potential buyers]
> excited enough that they want to touch
> [the computer.]
>   -from an Apple advertising program

It has been suggested that a new curriculum is emerging based on the projected needs of our students in the information age. More emphasis is being placed on how to learn rather than on what to learn. Ue hope our students will become problem solvers, and those of us who have an enduring faith in technology applaud the use of computers and calculators which puts aside so much classroom drudgery, allowing our students to lift their eyes to observe the "bigger picture" beyond.

One can hardly pick up a recent educational publication without finding articles reflecting widely diverse opinions concerning the appropriate use of technology in the classroom, or presenting a dismal view of the fading dream of educational revolution as the computer takes its place in our nation's schools.

Texas computer literacy teachers are in a unique position to "make a difference" as these issues are being debated. Ue can encourage others to become involved, and help to generate an enthusiasm that will not be ignored.

By including a software evaluation unit in the computer literacy course, your students might receive the following benefits:

■ overcome "machine phobia" through the extremely high motivational nature of the unit

■ learn how to use a mouse, a joystick, a drawing pad, a voice synthesizer, or other specialized peripherals

■ use vocabulary such as graphics, menu, and documentation in meaningful ways

■ become familiar with a wide variety of software products, and begin to form a basis for judging quality

■ learn to classify during the evaluation procedure

■ learn to rely on documentation

■ use their word processing skills to write letters to software publishers

■ use a class designed data base to keep track of evaluations

■ have firsthand experience with copyright laws and back-up policies.

As a teacher, you can enjoy these additional benefits:

■ stay current with new products

■ become familiar with software outside your own area of expertise

■ begin to get a "feel" for what is on the market

■ become familiar with different publishers' approaches to presentation of subject matter

■ become familiar with various publishers, their company policies, the reliability of their products, and the quality of their support services

■ anticipate problems that classroom teachers will encounter when using software, and begin to formulate some possible solutions

■ observe how your students interact with different software, and discover what approaches are most successful with them

■ invite content area teachers into your lab for a demonstration when you find a quality product

KEYBOARDING, LUBBOCK I.S.D. STYLE

Mary Upton, Asst. Principal/Elementary Computer Specialist
Marianna Sparks, Computer Technologist
Jackson Elementary
201 Vernon
Lubbock, TX 79415

Keyboarding is a prerequisite to using the computer as a writing tool. With the help of local business educators, Lubbock Independent School District has developed and implemented a successful keyboarding program at the elementary level. Techniques, software and teacher inservice will be discussed.

Lubbock Independent School District is in its sixth year of computer education at the elementary level. Lubbock's forty elementary schools have one or two Apple IIe labs at each elementary campus depending on size or special needs of the particular campuses. Each lab is staffed by a certified teacher who has completed an additional 150 clock hours of computer instruction through staff development to be qualified as a full-time Computer Technologist. All students are scheduled weekly for hands-on computer use. In some schools, the labs are also used for Chapter I remediation in reading and math.

With the onset of Lubbock's computer program, keyboarding has been recognized as a necessary skill to be included in the computer curriculum. Through trial-and-error experiences, reading of literature in the field, and working with various pieces of keyboarding software, the fifty Computer Technologists in Lubbock have developed some excellent methods for teaching keyboarding. However, the following factors influenced our need to refine our previous keyboarding program.

* State requirements for a district plan for technology including keyboarding instruction at the elementary level.
* A shift in our philosophy about how computers should be used--less emphasis on programming and more emphasis on using the computer as a tool to make a student's work easier.
* Emphasis in current literature on the writing and reading connection and the use of the computer as a writing tool.

Our present goal is to provide keyboarding instruction to elementary students before they begin using the computer for word processing activities. With this goal in mind, we sought the help of those in the business education field to help us refine our keyboarding program. Our present program is based on a color-coded method developed by Cherie Jenkins, Computer Technologist from Iles elementary. The program is supplemented by locally produced software using the same color-coding. We will share specific descriptions of the program, teacher inservice training and commercially produced books and software that have proven to be most successful to reinforce learning.

Computer Assisted Instruction in Your Language Arts Class

Donna Vacek and Anita Givens
Liberty Elementary School
1202 Bowie
Liberty, Texas 77575

This session will provide a detailed outline for incorporating computer assisted instruction in your language arts class. It will include how to get started, what to use, and what to expect from your students and yourself. Organizing materials, scheduling students, and record keeping are some of the topics that will be covered.

When using a new learning tool in the classroom, it is important to have realistic goals for yourself and your students. Using computer assisted instruction in your language arts class is a bold step that can be immensely rewarding. It does, however, require detailed planning.

First, you must determine how you plan to use the computer. There are several options and you may wish to use more than one. Using the computer as a diagnostic tool gives you detailed information about your students' strengths and weaknesses. It allows you to focus your instruction on those skills students need most. Many diagnostic software packages are available for this purpose with detailed record keeping functions. The computer can also be used to teach and reinforce specific skills. From experience, we can advise you to pick an area in language arts such as reading, writing, or spelling and concentrate your efforts on that area. As you become experienced using computer assisted instruction, you then can broaden your application. It is best to become very good at doing a few things than only adequate trying to do it all.

The next step is to see what hardware and software is available for you to use. The number of computers you will have in your classroom will help determine the type and length of activities. Software is the next major concern. A tremendous number of packages are available and many are designed especially for classroom computer centers. Whatever is available on your campus should be previewed. Often, you can find someone else who has used the program and get helful tips from them. We will provide an extensive list of tried and true programs and tips for using them with your students.

If you can purchase software, one of the best investments is a word processing program. All of the language arts skills can be taught and reinforced with word processing activities. All word processors designed for classroom use have lesson ideas available. In addition, we have developed a handout of those we find most effective.

As you explore software, you will be able to determine the purpose of the computer in your classroom and then set up your computer center. As with any center activity, students will need initial instruction on using the computer, rules, scheduling, and record keeping. As the center becomes an integral part of your classroom, you will discover new ways to incorporate computer activities into your daily lesson plans. The computer will become a useful tool in creating signs, charts, bulletin boards, and other materials essential to the smooth operation of your computer center.

Each new software package introduced will require some teacher assistance at first. Many, however, are user friendly. That is, the first time a student uses the program, they can easily understand the instructions and commands and need little teacher assistance. You will find those that work best for your particular students. Software companies tend to use similar format with all their programs and students quickly become familiar with the procedures even when the content varies. Again, once you discover the programs and publishers you prefer, you will quickly develop a system that works for you. We will give you helpful hints to get you started and share our successes.

Lesson planning is always a challenge and adding computer instruction can be intimidating. It need not be. Just as you use other teaching methods, CAI can easily fit in to your plans. Instead of a printed worksheet, computer activities can reinforce skills taught. Pre and post testing is quickly and easily accomplished on the computer and it grades them for you! Introducing a new concept can also be handled by the computer when you have appropriate software. Often students can understand the step by step tutorial when they have many opportunities to try out the skill with no pressure from others. The computer also makes individualized instruction a true reality. Each student can work on exactly those skills you have identified. Reteaching takes on a new look when done via computer software. The same material presented several different ways can be the key to understanding for some students.

Writing becomes a pleasure for students as they become familiar with word processing. Students love to write when they don't have the tedious job of starting over each time they make an error or wish to revise their work. Students can become successful writers at an early age and develop a love for writing that will benefit them in all their school endeavors.

Support for classroom computing is available from several sources. Many teaching magazines have sections for computer learning. Those most helpful, however, are the teaching magazines devoted totally to computer instruction. There are quite a few available and some may already be in your school library. We will provide a current list of publications as well as organizations and workshops available to assist you.

Computer assisted instruction is an exciting new tool that teachers are incorporating into their classrooms in schools across the nation. Our students are learning valuable skills while they become familiar with new technology. Computers truly open the window to the future for you and your students.

AUTOMATED ACCOUNTING

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This session is designed to demonstrate how to enhance your accounting curriculum through the use of computers. Software to be demonstrated: Beginning and Advanced Automated Accounting from South-Western Publishing Company, and Accounting Applications for Spreadsheets from Dictation Dic.

Computers have become an essential part of the business world environment. Employers, therefore, expect new accounting employees to have a working knowledge of computer applications as well as an understanding of the accounting principles and procedures. Because basic principles and procedures are imperative for students to learn before computer applications are implemented, there are some concerns about when to combine manual and computerized accounting.

The accounting course can easily accommodate the combination of manual and computerized accounting. Instead of performing several manual problems, substitute and utilize computerized accounting activities. Allow students to complete a manual practice set first, then complete this same simulation using computerized accounting. Of course, an appropriate software is necessary to accommodate this process. Computerized accounting should not and will not take the place of manual accounting. It is imperative that students learn the basic principles and procedures in accounting first.

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WRITING TOOLS FOR YOUNG LEARNERS

PATRICIA A. WALKINGTON, DIRECTOR OF EDUCATIONAL
SALES----THE LEARNING COMPANY

The Learning Company brings desktop publishing to children,
grades 2 and up, with The Children's Writing & Publishing
Center. See how easily you and your students can create
first-class illustrated reports, stories, poems, certificates
and more. Discover how this new program along with Writer
Rabbit can support your entire writing curriculum!

The Learning Company is a pioneer in educational software,
and the developer of such widely acclaimed problem-solving
programs as Rocky's Boots and Gertrude's Secrets. Recently
the company's new direction has included the development
of its highly successful Rabbit series--Reader Rabbit,
Math Rabbit, and Writer Rabbit. These programs are designed
to help children develop thinking skills as they learn the
basics of reading, writing, and arithmetic. The Children's
Writing & Publishing Center, a powerful but easy-to-use
desktop publishing program for elementary children, represents
the newest edition to The Learning Company's best-selling .
product line.

This presentation will focus on a comprehensive writing
and publishing curriculum for grades 2 and up. Emphasis
will be on pre-writing as well as writing, editing and
publishing. Teachers will be able to see how easily their
students can create reports, stories, poems, newsletters
and more. The presentation will feature writing activities
contained in the school edition of the program. These
activities focus on working with words, (using multiple
font styles), playing with pictures, (using the program's
graphics or incorporating graphics from other popular
programs such as Print Shop), editing, revising and moving
text, and designing beautiful full color documents in
both report and newsletter formats.

E-FONT
An Apple II Presentation Font

John M. White
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Session Abstract

Onr difficulty found when creating educational software for the Apple II computer is the placement of text characters on the high resolution graphics screen. The E-FONT software package solution for this problem uses only one shape table to produce dozens of high resolution fonts. The participants are shown how to use this unique software tool.

Session Description

In this session the participants are given the software disk and documentaticn, and are shown how to use the E-FONT presentation character graphics in their own Applesoft BASIC programs. Since E-FONT is the substance of a Master's Project at the University of Houston, Clear Lake, the participants are asked to complete an evaluation of the materials.

The E-FONT software allows the user to combine text characters and other symbols and graphics on the high resolution screen with a high resolution image produced by any process. The presentation discusses various ways a high resolution image is produced and shows how the E-FONT software is used to place text characters on it. Other applications include title screens, billboards. and custom designed continuous form labels.

The E-FONT software is conceptually different in several ways. The characters are produced from only one shape table. Once a disk using E-FONT is booted no disk accesses are required to produce any combination of font styles. The styles are produced by short subroutines included in the user's program which use the shape table to produce the various styles. The user can develop additional subroutines for even more styles. Among the styles are the standard text screen character set and many larger sizes. The standard ASCII character codes are expanded to include subscripts/superscripts. special educational characters and graphics, and can be expanded even more by inclusion of shapes custom designed by the user. For larger sizes the characters may be dithered, animated. rotated. produced in different colors and sizes, and the various styles can be combined in any way.

The E-FONT disk includes useful utilities, educational applications, and demonstration programs. The documentation provides the information needed for inclusion of the subroutines in the user's own programs, and gives details for modification, adaption, and enhancement. Some of the E-FONT styles are shown in the illustration. To obtain this disk, inservice on its use, or other information, contact the author.

Illustration of E-FONT Styles

STANDARD 123456789 OLID SOLID

BOLD STANDARD INLINE

OUTLINE BONES

PERFORATION

ROUNDED LOVE QUILT

PINSTRIPE GRIDIRON

SCULPTURE VICTORY

CHECKER

Animated Styles

TELESCOPE BOUNCING

EXPANSION FIREWORKS

ZIPPER RAINBOW

COMPUTER AIDED DESIGN IN THE HIGH SCHOOL

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Smithson Valley High School
Comal Independent School District
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New Braunfels, Texas 78130

This session explores the usage of the computer-aided drafting (CAD) with high school students. Emphasis is given to showing CAD features which can be used to develop and create graphic presentations. Demonstrations include how to draw, copy, move dimension industrial drawings. Drawings created by high school students will be shown.

During the past several years, the term "Computer-Aided-Drafting" (CAD) has come into being. As one becomes more involved with Industrial Technology Education, one is consistently confronted with a series of questions from interested individuals on content areas. The most common questions are related to how computers are used.

The National Commission on Excellence in Education, published the report, "A Nation at Risk," which states in part:
"Computers and computer-controlled equipment are penetrating every aspect of our lives---homes, factories and offices. Technology is radically transforming a host of occupations. They include ... energy ... construction ... building ... repair and maintenance ... scientific equipment ... education ... military and industrial equipment. We are raising a new generation of Americans that is scientifically and technologically illiterate."

Several institutions are starting to move away from traditional drafting programs. In addition, many teachers themselves are questioning the value of traditional drafting programs, due in part to their inability to justify the content and equipment being used. With the renewed emphasis on basics, computers, technology literacy and a strong education, it is important that our students must be confronted with experiences that are related to their areas of interest. Experiences that help develop problem-solving skills and increase scientific and technological literacy are a MUST.

"American education and industry are still trying to adjust to the wide applicability and immeasurable potential of robotics and computer-aided design (CAD) systems. These new technologies are the new waves in design and manufacturing. While robotics is gaining rapid acceptance for assembly line production, CAD is providing the drawing features for applications in architecture, cartography and civil, mechanics, and electrical engineering.

Post-processors are available that interface CAD systems with CNC machines and CAM applications. CAD designs can be sent straight to robotic assembly devices. One of the most evident advantage is an increase in productivity. Other advantages are: 1. drawings are more precise, 2. easier to assimilate than learning on mainframes, 3. more ancillary software and 4. hardware peripherals are easily obtainable.

Computer-Aided Drafting --- Getting Started

This session will provide information about the vocabulary, operation and 2D philosophy of a CAD system.

Objectives: 1. Demonstrate the operation of a CAD program.
2. Demonstrate the operation of hardware.
3. Demonstrate the basic principles and vocabulary of a CAD system.

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G / T   K I D S P E A K !

Nancy Williams
La Porte Independent School District
La Porte, Texas

"...from the mouthes of babes..."   Sometimes our children are one of the best sources of advice and creative ideas. A panel of gifted adolescents will share their expertise and views about current computer software.

Students from the DIMENSIONS Program for Academically Gifted (La Porte Independent School District) will participate in a panel discussion regarding computer software. These Baker Junior High students will discuss their favorite programs and suggest creative applications for common software. Teaching suggestions and implications for using computers with the gifted and talented will be topics of brainstorming sessions. Guided imageries for generating enthusiasm among computer literacy students will be shared.

Discussion topics for the panel will include using computers for word processing, reports, special projects, tutoring, research, problem-solving, and creativity. Traits of the gifted will be discussed and matched with software appropriate for meeting the needs indicated by those traits.

Language Arts/Technology: The Magic Doesn't Just Happen

Roberta Young---Spring Branch ISD/955 Campbell/Houston 77080
Martha Muncrief---HCDE/6208 Irvington/Houston 77022
Donna Wood---Alief ISD/P.O. Box 68/Alief 77411
Dr. Perry Pope---Spring Woods H.S./2045 Gessner/Houston 77080

An effective computer-assisted writing lab must meet the needs of the student population within the school as well as integrate its program into the writing curriculum and philosophy of the district.

The development of an effective writing program involving instructional technology, therefore, requires commitment at all levels: faculty and in-building administrators, central office personnel, outside resource people. Individuals in each of these positions offer a different perspective of the needs and functions of a writing lab and the role he or she plays in its successful implementation.

The "magic" which "doesn't just happen" in the creation of a successful computer-assisted writing lab is not magic at all, but rather the result of the cooperative efforts of many individuals. The presenters on this panel represent four different perspectives on the design and implementation of such computer-assisted writing labs.

An English language arts teacher/lab facilitator addresses the integration of word processing capabilities into the writing process and the change in attitudes, curriculum, and teaching strategies that this innovation requires.

A technology coordinator provides a rationale and framework for initiating and maintaining a successful program at either the middle school or high school level.

A high school principal addresses the philosophy and commitment of campus administrators who help create the environment conducive to the success of a writing lab.

A technology resource specialist offers the scope and variety in the "big picture" of using computers to improve student writing in a lab or in a classroom.

Insights and guidelines based on research and experience will provide participants with both a general overview and specific details useful in planning programs for their own schools.

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District Wide Implementation of Gradebook Software

by

William H. Zaggle, President

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ABSTRACT: The problems and solutions involved in implementing a district wide electronic gradebook will be discussed. Specific issues include software selection, interface to district level computer systems, network applications, teacher training, and continued vendor support. The presentation will also include a short demonstration of Excelsior Software's classroom management tools for grade management, test itembank development, criterion reference test scoring and analysis, and TEAMS scores analysis and reporting. Additional materials concerning use of Excelsior Software products will be distributed.

Excelsior Software has developed a series of classroom management tools for use with IBM and other compatible MS-DOS based personal computer systems. One of these products, Excelsior GRADE, has recently been adopted by several school systems for use as a standardized electronic gradebook for teachers. The major issues underlying the selection and implementation of Excelsior GRADE have been the technical merits of the software, its ability to be integrated with other software products, and the initial training and on-going support available from Excelsior. Plano I.S.D. in Plano, Texas and other districts around the nation are actively implementing district wide electronic grade management/student tracking systems. Working closely with these districts, the people at Excelsior Software have become knowledgeable of the problems involved with such an implementation.

The first problem facing any district wishing to structure a standard grade management system for teachers is the selection of capable software. Selection of any software should be based on its ability to perform the necessary tasks, how easy it is to use, what continued support can be expected, the cost of the software, and its availability under a district wide license. Prior to making a selection, Plano I.S.D. formulated a set of 35 basic criteria for a complete Electronic Gradebook. These guidelines helped them to evaluate the many different gradebook programs that were available. Shown below are some common gradebook criteria that should be considered.

A LIST OF TYPICAL GRADEBOOK CRITERIA

1. # of Unique Grades per Student.	11. Missing grades not included in computation.
2. # of Students allowed per Classfile.	12. Grades recomputed as weights, etc. are changed.
3. # of Student Demographic Items available.	13. Password protection of class files.
4. Both Grade and Category Weighting.	14. Floppy and Hard disk compatibility.
5. Both Numeric & Letter Grade Capability.	15. Optical Scanner Support for Scoring Tests.
6. Spreadsheet-like entry/editing of grade data.	16. Ability to integrate with 3rd party software.
7. Built-in Report Editor/Generator.	17. Ability to import/export data files in various formats.
8. Capability of automatic grade curves.	18. Ability to be used on a network system.
9. Average, Summation, Percent & Mark grading.	19. Integrated or Automated backup feature.
10. Automatic dropping of High & Low Grades.	20. 100% menu driven, on-line help, mouse support, etc.

Most districts have a central computer system as well as smaller classroom based PC's. When considering peak load times, the distributed processing power of multiple PC's is usually a more fe sible solution than a capable central computer system for the task of teacher grade management. Unfortunately most PC based gradebook programs are limited in capacity, are not networkable, and do not interface with the central computer's software. This requires the district to develop a gradebook program for their larger central based system.

One of the criteria which Plano I.S.D. weighted highly was the ability of the gradebook software to be integrated into a system of software from different vendors. For an electronic gradebook program to be useful on even a partial district wide basis, it is necessary to assume that some integration with existing computer software will be required. Test Scoring, Grade Reporting and Class Scheduling software are the programs most often integrated with electronic gradebooks. Excelsior GRADE interfaces to these type programs through standard ASCII data files. Additionally, Excelsior GRADE comes with a utility program called Excelsior GRADE Interface or EGI. EGI allows the automated transfer of data to be controlled by 3rd party or user written applications. A diagram of how Excelsior GRADE, EGI and other software might interact to form a completed system is shown below.
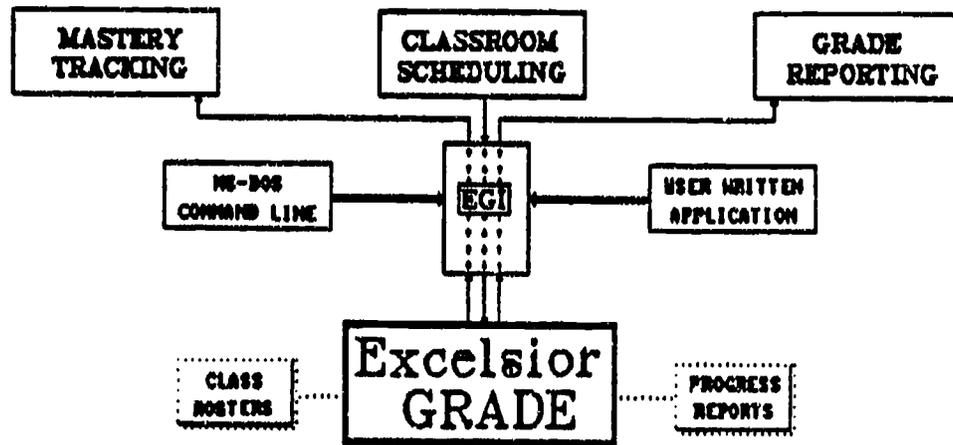
Training is a second major problem that will be faced by any district attempting to implement a successful district wide adoption of teacher level software tools. Plano I.S.D. chose to work with a few computer department staff to develop a suitable training manual specific to PISD. The training manual, a carefully selected subset of the full users guide, was made available to teachers via their school library. Excelsior provided training for an initial set of "Trainers" made up of PISD staff, who then led the teacher training sessions during the summer of 1988. Manuals and diskettes were distributed to teachers who attended summer training sessions, solving another problem of how to initially distribute the software. A second more advanced session was offered for those who wanted to learn more about the Report Generator, Test Scoring and other advanced features of Excelsior GRADE.

One additional aspect of training that is often overlooked is the importance of teachers making frequent and adequate backups of the gradebook data. Teachers should be shown how to format disks and make backups of their classfiles using the backup feature of either the gradebook program or MS-DOS. Emphasis should be placed on the volatility of magnetic media vs. paper media. Plano I.S.D. experienced some initial problems with inadequate backups and subsequent loss of grade information. However, with nearly 1000 teachers trained on the use of the gradebook at PISD, no loss of grades has been reported for the 1988-89 school year. Of the many thousands of users of Excelsior GRADE, Excelsior has had less than 20 documented cases of lost grades.

A third problem with district implementation is continued support. Most districts will find problems unique to their situations as the gradebook becomes a more active part of a teacher's routine. Unique grading requirements and unique reporting requirements are just a few of the expected needs for continued quality support of the software. Some features were customized for Plano I.S.D. and other districts in order to provide the smoothest transition for their teaching staff from paper to computerized gradebooks. Excelsior offers initial on-site training, toll-free phone support, custom programming and consultation, and free updates with a separately available support agreement. This additional support is made available to guarantee the success of the Gradebook Software in meeting a district's needs.

Customers are by far the best designers of software! Excelsior listens to customers and attempts to make quarterly updates available with features and enhancements suggested by teachers using the software. Putting teachers in the design loop allows the software to be flexible enough to handle all the different ways teachers manage grades. If you would like more information concerning Excelsior GRADE, please write or call:

Excelsior Software ▪ P.O. Box 2760 ▪ Bryan ▪ Tx ▪ 77805 ▪ (409) 774-4729.

COMPUTERS: THE CHARISMA CONTINUES

Ruth Zepeda, M.A.   Barbara Wadley, M.S.
          Speech Pathologists-Dallas I.S.D.

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Two of the "flags" frequently waved at public school speech pathologists are carryover of learned skills and relevancy of speech therapy activities to classroom objectives, i.e. Essential Elements. Also one of the most frequently asked questions is, "What about a professional report?" Public school speech pathologists propose to address these three issues through the use of computers.

In speech therapy the speech pathologist is charged with the responsibility of teaching/training a variety of concepts/ skills. Sometimes these are mastered within the therapy setting, but the student does not "carryover" these skills in his/her routine life. How do we get past that obstacle? How do we show others that the concept/skill is there? How do we make the student comfortable with his/her new skill in the everyday environment?

For many years classroom teachers have pointed at speech therapy time as the time when Billy or Juanita missed valuable class time to "play games" in speech. Even when the purpose of particular games was explained, we seemed to fall short of the mark. Even when told that Billy or Juanita didn't understand what was going on in the regular class, some did not understand. And most have never understood that when Piaget said, "The natural work of children is play," he meant they're not small adults.

Through the use of selected software and creative therapy planning some of the objectives which may be addressed are as follows:

1. Improving grammar and syntax

2. Improving organizational skills

3. Increasing meaningfvl interactive dialogue with peers

4. Understanding the concept of rhyming

5. Memorizing---a short poem, multiplication tables

6. Understanding vocabulary for specific curriculum areas/functional communication for older special education studenus

7. Associating sound/symbol.

Furthermore, a speech/language assessment report which may be accessed for Apple through Appleworks or for IBI. through Word Perfect will be demonstrated. It is based on the Dalles I.S.D. report which meets current TEA requirements. It allows the user to delete inappropriate statements or add relevant information as necessary to individualize the report.

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ELEMENTARY

HARDWARE/SOFTWARE

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MEDIA

MUSIC/ART

SCIENCE

SOCIAL STUDIES

SPECIAL EDUCATION