Is Programming a Good Activity for Children?

I just can't stand reading those articles in the literature for and against programming that leave you not knowing what kind of experience, if any, the author has had with this activity. Personally, I'd feel really uncomfortable about arguing that programming (or anything else) is "good for" children if I never did it myself, or hated doing it, or had any doubts about its value for me. So I thought I would write this column about the kinds of programs I have made recently.

I begin with a very simple program that came about while I was writing this column.

In this job I used two bits of knowledge that go beyond what a third grader with Logo experience could be expected to know. One is technical: There are 36,000 tenths of a second in an hour. The other is much more important. I fear that even in some of the very best school Logo environments the students don't actually know that what makes sense of Logo, of computers, and of programming in general is putting it to use when one really needs it in real-life situations.

Real life uses can be very varied. I have written programs as gifts for little children — sometimes to amuse, sometimes to open horizons for thinking, sometimes as a basis for relationship, most often for all these together. I have even written programs to amuse a cat. Last week I wrote one to help figure out where to plant bushes so as to make sure that a shack would be invisible at all points on a complexly shaped shore-line, and then used Logo graphics to present the underlying principles of geometric perspective without "trig" or any other "fancy" math.

These examples sound too serious. Some of the programs I do are pure play. . . which doesn't mean they don't serve a purpose. Think of doodling. When people sit in a meeting drawing patterns on paper this doesn't mean they are not listening — doodling is more like an accompaniment to the intellectual music. I've often written little Logo programs in the same
friend, you may use the response form on page 7 to request a subscription.
Do you know someone who received the first issue of Logo Update last spring and is wondering where the second issue is? That person probably didn't ask for it.

There is no charge for Logo Update, but you must request a subscription by using the response form, or simply by calling, writing, or sending an electronic mail message with your name and address.

I also encourage you to make copies of Logo Update to distribute in courses, workshops, and to give to colleagues. (Please comply with the conditions of the copyright notice in the box above.)

Finally, thanks to all of you who made donations to the Logo Foundation. An annual contribution of $25 covers the cost of your copies of Logo Update and helps to support other free services provided by the Logo Foundation.

I hope you find this issue of Logo Update to be informative and thought provoking.

Michael Tempel
Where's the PROGRAM?

by Eadie Adamson

All versions of Logo provide ways for you to look at programs. If you need to know how something works, want to debug it, or simply want to look at programming style, you can print out procedures (pops), or poall to see variables and procedures. In some Logos edit all puts all procedures and variables in the editor for you to examine and modify. With LogoWriter you “flip” the page. Someone knowledgeable can look at the code and deduce what a program does.

With MicroWorlds Logo these strategies will severely limit investigating or debugging a program. What we used to think of as “the program” now doesn’t tell the whole story. There’s a lot more going on than what may be revealed by a peek at the Procedures Page. The Procedures Page may even be blank! The program may be attached to turtles, buttons, and other objects.

Where is “the program”? Do we need a new definition of the word program? Here are some places to look as you find your way around a MicroWorlds project:

Procedures Page
You write procedures here as you would in a Logo editor or on the Flip Side of the LogoWriter page.

Turtles
Instructions may be attached directly to turtles. Then clicking on a turtle with the mouse runs the instruction. These instructions may be Logo primitives and/or procedures you write on the Procedures Page. In the project below, a turtle named “bird” carries an instruction to alternate between shape 11, a wings-up bird and shape 12, a wings-down bird, while moving forward a bit.

Colors
Colors may be programmed so that when a turtle touches an area of a certain color an instruction list is run only “once” or “each time” the turtle goes over that color. The choice is yours. You may also program a color so that an instruction list is run when you click the mouse in an area of that color.

Text Boxes and Sliders
Text boxes and sliders contain information that may be used by a program. The name of a text box reports the text that’s in it. The name of a slider reports its value. In MicroWorlds Logo you may find yourself using text boxes and sliders where you used to use variables.

Remember, with MicroWorlds, there’s more there than you think! Where’s the program now? ▲

* Mitch Resnick gives some excellent examples of how this kind of excitement can be used in school settings. See Logo Overnight, 1993, Logo Foundation.

A companion piece to this article, Is Programming a Good Activity for Children? - Code and Comments, is currently being prepared by the author. Check the appropriate box on the Response Form on page 7 if you want to receive a copy.
The St. Paul Logo Project
by Michael Tempel

The St. Paul Logo Project is different. For the past 12 years, Geraldine Kozberg, founder of the project, has held a series of administrative positions in program and staff development with the St. Paul Public Schools. None of these positions has been “Technology Coordinator.” In St. Paul, Logo is not only something to do with a computer – it is one of a number of programs and strategies aimed at school change and improvement.

Logo in the Classroom

St. Paul has avoided School’s tendency, described by Seymour Papert in The Children’s Machine, to confine computers to a special place with a specialist teaching “computer literacy.” In St. Paul, Logo is part of the life of classrooms, taught by regular classroom teachers. Even at the secondary level, Logo is used by mathematics, science, English, social studies, and art teachers.

First grade teacher Helen Kraft at Jackson School developed a science project on animals. It was not a “Logo project,” but Logo played a part. Along with many other activities, children drew animals and wrote about them using Logo. In the process they also learned some geometry. Through Logo, many children began writing before they learned to read.

At Mann School the school-wide curriculum for the 1989-1990 school year was the Middle Ages. The culminating activity was an “Expo” during which the gym and corridors were filled with exhibits of student work for parents and other visitors to see. Judy Ronnei’s fifth-graders built a LEGO castle, complete with computer-controlled drawbridge and jousting knights. A computer was set up with a quiz about the Middle Ages. But it wasn’t the students who were being subjected to this quiz. They wrote it, in Logo, for the visitors to test their knowledge.

St. Paul students created a LEGO Logo exhibit at the Minnesota Museum of Science. It included a “house of the future” in which furniture automatically moved out of the way when a vacuum cleaner approached. An “alarm bed” tilted up, sliding its occupant out a window and down onto the street below, ready for the day ahead.

Assessment
When it came to assessing the early results of working with Logo (1983 and 1984), University of Minnesota sociologist Pete Fire Dog found that about half the students using Logo showed academic improvement, according to their teachers. Improvement was seen among students of varying backgrounds. “Logo effects seem to be both wide ranging and substantial, and appear to be available to students from almost any type of learning, social, or motivational background.”

Collaboration
From its beginning in 1982, the St. Paul Logo Project has been a collaborative effort with corporate, university, and foundation support playing a major role. The St. Paul Companies provided financial aid. Engineers from the 3M Company tutored in classrooms. University partners included University of Minnesota, Macalester College, and Hamline University.

Outside consultants have played an important role. Seymour Papert and other members of the MIT Logo Group have taught and lectured in St. Paul. Logo Computer Systems provided software, materials, and professional development services. Since its founding in 1991, the Logo Foundation has worked closely with the Project.

The St. Paul Logo Project has been a Mecca for educators from other districts, many of whom have attended the annual Logo Summer Institutes that have been the foundation of Logo teacher education.

Over the past 12 years approximately 350 teachers from half of St. Paul’s 66 schools have been involved in the project. Currently there are 20 active Logo schools.

The project has changed with the times, adopting new software and hardware. What has not changed is the commitment to Logo’s constructionist philosophy, and to educational equity and school improvement. ▲

For more information . . .

The St. Paul Logo Project has published collections of research papers, essays, classroom reports, and lesson plans:

Logo Learning in a Computer Culture (1985)


The Way It Ought to Be; LEGO Logo Lesson Plans (1988)

Logo Animals
by Helen Kraft (1991)

These documents may be obtained without charge by contacting

Geraldine Kozberg
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Book Review
by Carol Sperry

New Paradigms in Classroom Research on Logo Learning
Edited by Daniel Lynn Watt and Molly Lynn Watt, ISTE, 1993 $19.95

In 1991, a group of teacher-researchers came together for a one-day miniconference on Logo classroom research at the National Educational Computing Conference in Arizona (NECC). Nine of the papers presented at that conference are included in this monograph, the third in a series published by the International Society for Technology in Education.

A section called "Cognitive Outcomes of Logo Learning" comprises five of the nine papers. The remaining four are categorized as "Logo Learning in a Social Context." The work represents a healthy attempt to pair teachers and researchers in collaborative ventures and to try finally to place Logo research in the context of the classroom or learning culture.

I found the lead-off article, "Making a Case for the Learning Culture as the Focus of Classroom Research," by Jim Dunne, a valuable overview and good critique of past research, most of which tries to treat Logo as a stand-alone treatment for what ails the schools, or, as Sylvia Weir states, "... as some patent medicine, good for everything regardless." As Dunne points out, "Without the associated learning environment, Logo is just technical knowledge."

Dunne cuts to the heart of the matter by stating: "Many of the underlying issues, themes, and approaches associated with Logo are closely linked to old struggles on the nature of learning, the purpose of schooling, and the role of teaching. The history of education and the literature of educational change indicate that it is unlikely that an innovation or reform such as Logo will succeed when it conflicts with the prevailing beliefs and organizational structure of schools." We've all seen instances of this – creativity and excitement in the computer lab or around the computer – then back to a dry, traditional classroom atmosphere. But Dunne goes on to give a quite comprehensive and helpful list of what constitutes a good Logo learning culture. Finally, he notes that the current restructuring movement could provide the most fertile ground for Logo-like learning environments and for the creation of implementation models that "can help guarantee the fruitful survival of Logo."

The remaining eight articles are all based in classroom (or in one case, a museum) situations. Each offers insight into issues that surround learning and teaching, the life of teachers, cultures of learning, and the school system. In most cases, both teacher-researchers and university researchers are quite candid in their reporting of the ups and downs of the process. Consequently, researchers can learn a lot about their own processes and possibly avoid some pitfalls. It is refreshing to see work done by teachers, themselves, to answer their own real questions, rather than reports abstracted from a situation by researchers alone. Of course, even teachers can fall into the trap of trying to squeeze Logo learning research into a quantitative straightjacket. I think it's fair to say that shadows of an anachronistic educational system do fall here and there on these works: Computer time seems restricted in many of these school situations and there is certainly balkanization of subjects, but these can serve as reminders that the system has a long way to go. ▲

New Paradigms in Classroom Research on Logo Learning is available from International Society for Technology in Education (ISTE)
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Look for more information in the next issue of Logo Update.

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