Logo Research at Bank Street College

Jan Jewson and Roy D. Pea
The Center for Children and Technology
Bank Street College of Education
610 West 112 St.
New York, NY 10025

Microcomputers are being used in many schools throughout the United States in the belief that they have important educational potential for children. However, little research indicates what children learn from working with microcomputers, how they learn to work with the technology, and in what ways such skills relate to other academically relevant skills. We are particularly interested in the educational possibilities for children who learn to program microcomputers with Logo. Among the organizations funding the Center's research are the Spencer Foundation, the Xerox Foundation, and the International Paper Company Foundation.

Our research is concerned with revealing how children acquire computer programming skills and how the use of microcomputers in classrooms may relate to other cognitive and social skills. Research supported by the Spencer Foundation is being conducted in two classrooms (one of 8- and 9-year-olds and another of 11- and 12-year-olds) of the Children's School at Bank Street College of Education. The children are learning to program with Logo, and in each classroom they have access to six microcomputers. They can work alone or together as active programmers of their own projects.

We are investigating a number of specific questions concerning children's experience with Logo. One set of studies addresses the relationship between computer programming and problem-solving skills. It has been widely assumed that computer programming experience will enhance problem-solving abilities (Papert, 1980) because of the modular character of the work and the necessity of using debugging processes. However, this assumption has never been systematically tested. Therefore, one aim of our research is to examine relationships between the degree of Logo programming expertise and problem-solving and planning skills through longitudinal studies. This will enable us to determine the impact of Logo programming skill development.

As part of this investigation of the development of children's programming abilities, we will document the growth of knowledge about Logo as a language as well as knowledge of computers. Our work on Logo programming expertise will center on case studies of changes in children's knowledge of Logo over time in relation to the use of their knowledge to achieve project goals.

We are also investigating the social context of microcomputer use in classrooms. It has been observed in several different educational contexts that children seem to collaborate and teach each other more when they work with microcomputers. One study which we have completed indicates that children talk more to each other about problems they are doing when they work with the microcomputers, as opposed to other classroom work. Both the occurrence and quality of the interaction when children work together are of interest to us because we believe collaborative work to be an important learning context.

In addition, we are documenting the process by which the teachers incorporate microcomputers and the use of Logo into their classrooms. This work will be useful for addressing key questions concerning the best ways of using microcomputers with children in school. The research is intended to clarify our basic understanding of planning, problem solving, and peer interaction in classrooms for this relatively new domain. ■