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fortable working with the high school math teachers. However, when it came to the middle school level, they decided that they needed help. This is where I came in. My background was appropriate since I had 13 years of middle school mathematics teaching experience. One of the first things that I discovered after visiting the schools was how little technology was being used in the teaching of mathematics. Sure, there were plenty of computers around, but they were mostly used for programming and computer literacy. So even if a math teacher had the inclination to use a computer for teaching purposes, it was not easy to do. So how does the use of computers become easier, or better yet, an integral part of the mathematics curriculum? It takes many things, but, at the top of the list, it takes a *commitment* on the part of the school district. What we discovered was that the reason most innovations fail is because the administration stops supporting it. So Stevens with the help of money from the state embarked on the project that would develop and nurture a commitment to computers in mathematics education over a long period of time.

This the second year of the project and changes are beginning to happen. The schools we are involved with are buying computers with projection devices for the math teachers so they can use one computer with a large group. In some of the districts, an entire lab is being set up solely for the mathematics department. A critical part of the process is, of course, teacher training which is handled through monthly meetings and a two week summer workshop that is paid for by both the school districts and Stevens. Even with the support from the adminstrations, this is a major task with many problems. All sorts of things come up that potentially can sabotage the work. But like Lewis and Clark who persevered in 1804—1806 to make the western part of this country accessible to all, we believe that *projects like ours will help transform the way mathematics is taught in this country and technology will eventually become commonplace in mathematics education*. In the meantime, there will continue to be obstacles and resistance.

One case in point. A colleague of mine went to a couple of regional math conferences in New Jersey and said there was not one mention of technology at either conference. Unfortunately this is still the norm and not the exception. *Most math educators are not yet computer literate enough to use computers as another tool for mathematics instruction*. So, what that means is that we have to continue to share the message of the power of technology and particularly Logo to make a difference in the lives of children.

On Meeting the *Standards*[1]

Someone suggested to me that maybe CLIME should become the Ralph Nader of the Mathematics Education community and remind people in some forceful way that they are not following the tenets of the *Standards*. We should formally scold regional mathematics conference committees that fail to include technology sessions for violating the *Standards*. Obviously, this was meant to be a joke. But there are times when I would personally love to go around the vendor hall at a conference and put a big "sticky" - the kind that you sometimes find on car windows that are illegally parked - on the "windshields" of vendor booths that proclaim that they support the *Standards* when in reality they do not. (We could call ourselves the CLIME Kops and also confiscate books that didn't have any good Logo in it. That would be fun to do - at least until they locked us up.) Though the idea is farfetched, it is based on reality. You've seen the books I'm referring to. They sport a fancy cover- but if you open the book to any random page you will probably find a set of problems whose sole purpose is computational drill. How do the publishers justify this? Some of them say these are calculator problems! You're suppose to do the problem manually and then use a calculator to check your work. What a novel idea!?! (In my day there were no calculators, but I could on occasion use the TEACHERS manual.)

The book may have a slightly different look, but the not-so-subtle message is still the same: You have to learn the skills, before you can do any interesting mathematics.

The publishers are very clever. They say the "right" things in the teacher editions and offer many interesting examples of what the teacher can do to enrich the lessons in the book, but the focus of the book itself is still on the rote mastery of skills. (For example, one leading "innovative" textbook offers a chapter entitled "Patterns Leading to Multiplication.") The book cover may have a slightly different look, but the not-so-subtle message is still the same: You have to learn the skills before you can do any interesting mathematics. We have to turn this around. The first priority is motivation. If children see that mathematics is interesting, they will accept and learn the skills necessary to become better at it. One way to approach this is to have children read books about mathematics. There are some wonderful books in the 500 section of the library that unfortunately for the most part collect dust. They would help children have a better understanding of the nature and spirit of mathematics.

Another important way to implement the spirit of the *Standards* is to have students routinely practice non-routine problems. Recipie following still runs supreme in most books. Even in the problem solving chapters students are asked to

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1 Curriculum and Evaluation Standards for School Mathematics (NCTM, 1989)