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between the page or a database can be visible or invisible.

### Telecommunications

LogoEnsemble contains all of the features of *LogoExpress*, LCSI's powerful and easy-to-use telecommunications software. LogoWriter and LogoEnsemble users can easily and inexpensively share online messages and collaborate on Logo projects via telecommunications.

A student can design a LogoEnsemble project to collect scientific (or social) data, graph the data, and then automatically forward the data electronically to another classroom or school on the other side of the world.

### So What?

I was talking with Greg Butler who created the public-domain database program, *FREdBase*. During our conversation we were sharing our dream of someday having database software which will deal with data in the ways in which kids collect and need to interrogate it. Greg suggested a scenario I could use to test LogoEnsemble's potential.

Let us say that we have asked fourth-graders to go out and measure the lengths of "things." Then we want the kids to put the data in one column (field) in the database, be able to manipulate the data, and eventually make a picture (graph) of the data. Easy, huh?

There is a problem. Some kids measured in centimeters, some in meters, and others in inches. Some kids used CM as the unit and others CENTIMETERS. All of this data will be in one column. Now try using Works or Excel to graph this data with different units of measure - you will need a helmet and goggles!

I was successful in creating a program to do all of this in LogoEnsemble. 130 cm was the same height

as 1.3 meters on the bar graph. The programming necessary to accomplish this task was not trivial, but it *was* possible. I am willing to trade "trivial" for "possible" any day! Besides, LogoEnsemble users can establish a collection of useful tools developed by others.

When LogoWriter was created, Seymour Papert was running around showing how cool programmable word processing was - you could actually switch two letters with a keystroke! In the hands of children this new functionality was much more powerful. The concept of screen-as-data emerged and kids were able to invent all kinds of hypermedia, dynamic stories, and videogame possibilities using these features.

One of the realities of the "Information Age" is that the data we must work with is often messy. We often need to "massage" the raw data into a manageable form. It is not uncommon to need to remove the 7th and 13th character in each line of text in order to use a collection of data. LogoEnsemble allows us to create the necessary tools for manipulating and interpreting our data. By the time you are ready to use Excel or a graphing package, you probably understand the data already - you have already answered the question. LogoEnsemble puts you in control throughout the entire process - in one environment.

The addition of mouse control, word processing, database/spreadsheet manipulation, and telecommunications to the Logo environment will afford learners with the opportunity to express themselves in ways we adults haven't even dreamed of. I look forward to sharing your LogoEnsemble projects in future issues of the *CLIME News*!

### References:

- Papert, S. *Mindstorms...* New York: Basic Books. (1980)
- Papert, S. & Solomon, C. "Twenty Things to Do with a Computer." *Educational Technology*. (April, 1972)

