

WISE DESIGN OF MATHEMATICS SOFTWARE

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The Web-based Inquiry Science Environment (WISE) offers software designers a flexibly adaptive learning environment that implements the scaffolded knowledge integration instructional framework (Linn, M. C. and S. Hsi (2000). Computers, Teachers, Peers, Lawrence Erlbaum Associates.), incorporates proven technology features, and supports promising instructional patterns. This presentation describes WISE mathematics projects (see <http://wise.berkeley.edu>), illustrates WISE data analysis tools, reports results from classroom trials, and discusses how WISE projects might improve mathematics instruction.

By supporting flexibly adaptive design, WISE can empower instructors and curriculum designers to test alternative ideas, analyze weaknesses in instruction, and redesign instructional materials to meet student needs. Teachers can also easily customize WISE projects, adding relevant data – such as water quality information from a local stream – and adjusting mathematics demands – by using qualitative or quantitative tools. WISE offers designers graphing tools, real time data collection options, connections to data collected by PDA and more.

The Scaffolded Knowledge Integration Framework has four main tenets that jointly support knowledge integration (Linn & Hsi, 2000). WISE has developed features such as discussion tools and patterns that combine the features to implement the framework. Research with WISE shows that students learn more when instruction combines making thinking visible using a graphing tool with making predictions, reconciling results with expectations, and testing ideas against established criteria. Figure shows data collection options for an earthquake project:

