

# Fluidity Software, Inc.

## IES SBIR AWARD:

2008, Phase I, \$100,000; 2009, Phase II, \$750,000

## KEY INFORMATION:

Address: 289 Highland Ave, Suite 304, Somerville, MA 02144

Website: <http://fluiditysoftware.com/>

Demo:

[http://www.youtube.com/watch?v=VCvxE7YgI6o&list=UU8kcEnQts\\_GYl7rNEcBVujw&index=3&feature=plcp](http://www.youtube.com/watch?v=VCvxE7YgI6o&list=UU8kcEnQts_GYl7rNEcBVujw&index=3&feature=plcp)

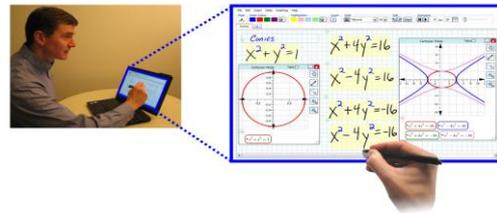
Contact: Don Carney,  
[donald.carney@fluiditysoftware.com](mailto:donald.carney@fluiditysoftware.com)

**PROJECT TITLE:** FluidMath; FluidMath Online Professional Development

**PRODUCT:** FluidMath is a software intervention designed for teaching and learning basic algebra. FluidMath combines the familiar and natural experience of sketching math problems with the power of computer generated solutions. As users write math expressions and make drawings on the screen of a pen-enabled computer (e.g., Tablet PC or Interactive Whiteboard), FluidMath recognizes the handwritten math formulae and sketches and generates solutions in the form of algebraic expressions, computations, graphs, and dynamic animations. An on-line Professional Development (OPD) program trains teachers to learn and integrate FluidMath within classroom practice. The OPD includes 17 modules, each consisting of an instructional video, a lesson document, and associated FluidMath example files.

**DEVELOPMENT:** The design and development was informed through the collaborative efforts of Fluidity's researchers and engineers, Brown University researchers, and a multitude of expert

math educators. The FluidMath software platform includes a gesture-driven user interface, writer-independent handwritten math recognizer, sketch-based animation engine, and general-purpose Computer Algebra System. To iteratively refine the components after the initial prototypes were developed, a series of small field trials were conducted. At 6 different time points during the project, a total of 25 teachers participated in the OPD program and then used prototypes of FluidMath in their classrooms. During each field trial, the research team collected data through surveys, focus groups, interviews, teacher logs, and from online interactions. Results were used to refine the prototypes and to finalize the product.



**RESEARCH:** Research was conducted in collaboration with the Brown University Education Alliance to test the feasibility, usability, and promise of FluidMath and the accompanying OPD to support student learning. The study included 229 students in grades 8 to 10, including 131 students in 10 classrooms where teachers used FluidMath and OPD and 98 students in 10 classrooms where teachers did not. In this study, teachers used FluidMath for between 1 to 3 class periods on topics including Algebraic Substitution with Integers, Algebraic Substitution with Fractions, Radicals, Inverses, Slope,

Exponents, Polynomials, Linear Inequalities, Trigonometric Graphing, and Simplifying and Evaluating Expressions. Results from this research demonstrated that FluidMath functioned well, was able to be integrated within instructional practices by all teachers, and was engaging for students. Results also demonstrated that student scores on test items for the above topics were significantly higher in classrooms where FluidMath was used than where it was not. Additional research is planned to test the efficacy of the intervention.

**PATH TO COMMERCIALIZATION:** Fluidity sells FluidMath and its OPD through multiple channels to market including direct sales, resellers and distributors, publishers, and original equipment manufacturers (OEMs). For example, Fluidity has teamed with OEMs and resellers at Texas Instruments, Promethean, and ProComputing to demonstrate FluidMath in sales presentations at major U.S. and International educational technology tradeshows including ISTE, TCEA, and BETT. As of 2012, FluidMath has been used by thousands of teachers and students in more than 300 schools, in more than 30 countries, and on 6 continents. Since its commercial release in 2011, FluidMath and the OPD have been sold to teachers and students at more than 80 schools worldwide.

## AWARDS:

- 2011: Voted the *Most Innovative Educational Technology Product* at the Software and Information Industry Association (SIIA) Innovation Incubator.
- 2012: Received the eSchool News *Readers' Choice Award*