Experiences with Commercial Educational Software: From Learning Objects to Market.

Jonathan M. Borwein, FRSC, Canada Research Chair in IT
Dalhousie University, Halifax, NS, Canada. URL: www.cs.dal.ca/~jborwein

I shall discuss my own recent research experiences with technology-mediated curriculum, see also [6], and the concurrent commercial implementation of such a middle-school *Interactive School Mathematics* currently being completed by *MathResources.*[^1] Many of the examples I give in [1, 2, 3, 5], or similar ones more tailored to school [4], are easily introduced into the curriculum, but only if the teacher is not left unassisted so to do. Technology also allows the same teacher to provide enriched material (say, on fractions, binomials, irrationality, fractals or chaos) to the brightest in the class while allowing more practice for those still struggling with the basics. That said, successful mathematical education relies on active participation of the learner and the teacher and my own goal has been to produce technological resources to support not supplant this process; and—I hope—to make learning or teaching mathematics more rewarding and often more fun.

The main conclusion of my experiences is that a *constructivist educational curriculum*—supported by both good technology and reliable content—is both possible and highly desirable. In a traditional instructivist mathematics classroom there are few opportunities for realistic discovery [7]. The current sophistication of dynamic geometry software such as *Geometer’s Sketchpad, Cabri* or *Cinderella,* of many fine web-interfaces, and of broad mathematical computation platforms like *Maple* and *Mathematica* has changed this greatly—though in my opinion both *Maple* and *Mathematica* are unsuitable until late in high-school, as they presume too much of both the student and the teacher. A thoughtful and detailed discussion of many of the central issues can be found in J.B. Lagrange’s article [8] on teaching functions in such a milieu.

References


[^1]: See [http://www.mathresources.com/products/ism/index.html](http://www.mathresources.com/products/ism/index.html). I am a co-founder of this twelve-year old company. Such a venture is very expensive and thus relies on commercial underpinning. I should happily offer a 60 minute workshop to complement this talk.