

1035-A2-510

Frank Wattenberg* (Frank.Wattenberg@usma.edu), U.S. Military Academy, Dept. of Mathematical Sciences, West Point, NY 10996. *21st century technologies for 21st century mathematics and science.*

Most of the technologies we use for discovering mathematics—whether new mathematics in our own research or as students discovering and learning established mathematics—have been around for quite some time. Moreover, we are using those technologies for incremental improvements. Meanwhile, our students are using really new collaborative technologies to achieve revolutionary change in the ways they work and play together. The Wikipedia, for example, has replaced its venerable print ancestors as the encyclopedia of choice for our students (and if we are honest for many of us as well). The Open Source movement in software design has produced remarkable software and at the same time has demonstrated new paradigms of collaboration. Consider the following quote downloaded from <http://wikinomics.com/> on 8 September 2007.

In the last few years, traditional collaboration—in a meeting room, a conference call, even a convention center—has been superceded by collaborations on an astronomical scale.

Today, encyclopedias, jetliners, operating systems, mutual funds, and many other items are being created by teams numbering in the thousands or even millions. While some leaders fear the heaving growth of these massive online communities, *Wikinomics* explains how to prosper in a world where new communications technologies are democratizing the creation of value. Anyone who wants to understand the major forces revolutionizing business today should consider *Wikinomics* their survival kit.

This talk is about a vision—using currently available collaborative technologies we can produce remarkable resources for learning in mathematics and the sciences from pre-kindergarten through research. Those resources will involve users

at all levels in creating and using immersive simulations and in the science and mathematics that is essential for the underlying modeling. The Internet can be used for much more than sharing photographs and videos. As mathematicians, scientists, and educators, we can move our disciplines forward and help our planet solve problems like climate change by collaboratively producing new resources for education and research that have the highest scientific and pedagogical quality and that are widely available. This is about the vision articulated by NSF several years ago of *Knowledge and Distributed Intelligence (KDI)*.

This vision will be illustrated by a new project whose goal is a powerful collaborative simulation and modeling environment that marries the immersive technologies of electronic games with serious mathematical modeling, science, and engineering. We hope this project will eventually involve thousands of faculty and we hope you will join it. (Received September 10, 2007)