

## Web-Based Software Uses Math To Grade Students' Writing

Univeristy of Colorado, Boulder



After 10 years of research, Thomas K. Landauer, Ph.D., a psychology professor at University of Colorado in Boulder, Peter Foltz, Ph.D., a psychology professor at New Mexico State University, and Darrell Laham, Ph.D., a graduate student at University of Colorado, invented Intelligent Essay Assessor (IEA). IEA is Web-based and conducts sophisticated mathematical and statistical evaluations of the semantic content of writing to issue a grade that correlates closely with what teachers or test examiners would give.

IEA automatically assesses and critiques electronically submitted essays providing feedback to both the student and instructor.

“ IEA allows teachers to assign more writing assignments to students without additional grading time and gives students opportunities to practice and improve their writing abilities.

The software relies on Latent Semantic Analysis to evaluate the quality of the semantic content of writing. Computer

modules are used to conduct a mathematical analysis of the semantic space, evaluate the words in the text, compare sections of the essay and integrate the scores from each module to arrive at a final score. IEA can also identify areas of weakness, recommend instructional materials and identify sections in need of rewriting.

Initial funding came through a series of research grants from the National Science Foundation, the Defense Advanced Research Projects Agency, the U.S. Army and the U.S. Air Force. IEA was invented in 1997 and patented in 2002 by Knowledge Analysis Technologies, LLC, a company formed by Landauer, Foltz and Laham. The company was acquired by Pearson Education in 2004 at which time it became known as Pearson Knowledge Technologies. IEA has scored more than two million student essays.

This story was originally published in 2007.

**To see available technologies from research institutions, [click here](#) to visit the AUTM Innovation Marketplace.**

Share your story at [autm.net/betterworldproject](http://autm.net/betterworldproject)

#betterworldproject