Carnegie Mellon University

Reinventing Education Based on Data and What Works • *Since 1955*

Carnegie Mellon is reinventing education and the way we think about leveraging technology through its study of the science of learning – an interdisciplinary effort that we've been tackling for more than 50 years with both computer scientists and psychologists. CMU's educational technology innovations have inspired numerous startup companies, which are helping students to learn more effectively and efficiently.

Simon, Newell

1955: Allen Newell (TPR '57) joins Prof. Herbert Simon's research team as a Ph.D. student.

1956: CMU creates one of the world's first university computation centers. With Prof. Alan Perlis (MCS '42) as its head, it is a joint undertaking of faculty from the business, psychology, electrical engineering and mathematics departments, and the precursor to computer science.

Perlis

1956: Simon creates a "thinking machine"—enacting a mental process by breaking it down into its simplest steps. Later that year, the term "artificial intelligence" is coined by a small group including Newell and Simon.

1956: Simon, Newell and J. C. Shaw (CIT '45,'46) of the Rand Corporation develop Logic Theorist, the first artificially intelligent computer program.

1975: Newell and Simon receive the Turing Award for their work on artificial intelligence, the psychology of human cognition and list processing. The pair inspires a wealth of other work on learning and cognition.

1975: Prof. John R. Anderson (CIT '61) and CMU colleagues further bring together the disciplines of cognitive psychology and computer science to develop a new model of how people learn.

1978: Simon wins the Nobel Prize in Economic Sciences for his work on decision making.

1983: The SOAR cognitive architecture and unified theory of cognition begins, led by Newell, John Laird (SCS '78,'84) and Paul Rosenbloom (SCS '78,'83). During the 1980s, CMU established three of the four cognitive architectures that were used to explore human perception, reasoning, learning and language.

HCII

• Human-Computer Interaction Institute

1994: The CMU Human-Computer Interaction Institute is created, connecting faculty from computer science, social sciences and design, with Prof. James H. Morris (MCS '63) as the first director.

1995: Prof. Kenneth R. Koedinger (HSS '88,'90) and Anderson develop Practical Algebra Tutor. The program pioneers a new form of computer-aided instruction for high school students based on cognitive tutors.

1995: Prof. Jack Mostow (SCS '81) develops Project LISTEN, an intelligent tutor that helps children learn to read. The National Science Foundation included Project LISTEN's speech recognition system as one of its top 50 innovations from 1950-2000.

1995: The Center for Automated Learning and Discovery is formed, led by Prof. Thomas M. Mitchell.

1998: Spinoff company Carnegie Learning is founded by CMU scientists to expand adoption of cognitive tutors that rely on sound learning principles for mathematics in U.S. public schools.

Carnegie Learning

1998: Educators from the School of Computer Science create a company, now called iCarnegie, to provide high-quality education, curriculum development and state of the art testing methods at scale.

iCarnegie

2002: The Open Learning Initiative (OLI) begins at CMU, supported by the Hewlett Foundation.

2004: Paving the way to a data-driven understanding of robust learning, the Pittsburgh Science of Learning Center (PSLC) is established as a joint CMU-University of Pittsburgh initiative, with funding from the National Science Foundation.

Open Learning Initiative

LearnLab Pittsburgh Science of Learning Cen

2007: Built with technology developed at the School of Computer Science and guided by founders with deep roots in education, Panopto offers a lecture capture system now in use at more than 400 universities.

2012: Study of students at six U.S. public universities shows that CMU's OLI statistics course (taught as combination of online and in class) is just as effective as regular lecture classes, showing the potential of interactive learning systems to maintain quality and reduce cost.

PANOPTO capture, stream, learn