Human-Computer Interaction

Educational Technology

Professor Bilge Mutlu

Today's Agenda

» Topic overview: *Educational Technology*

» Discussion

» Bonus lecture: *How to Conduct Online Studies*

» General Q&A

What is educational technology?[1]

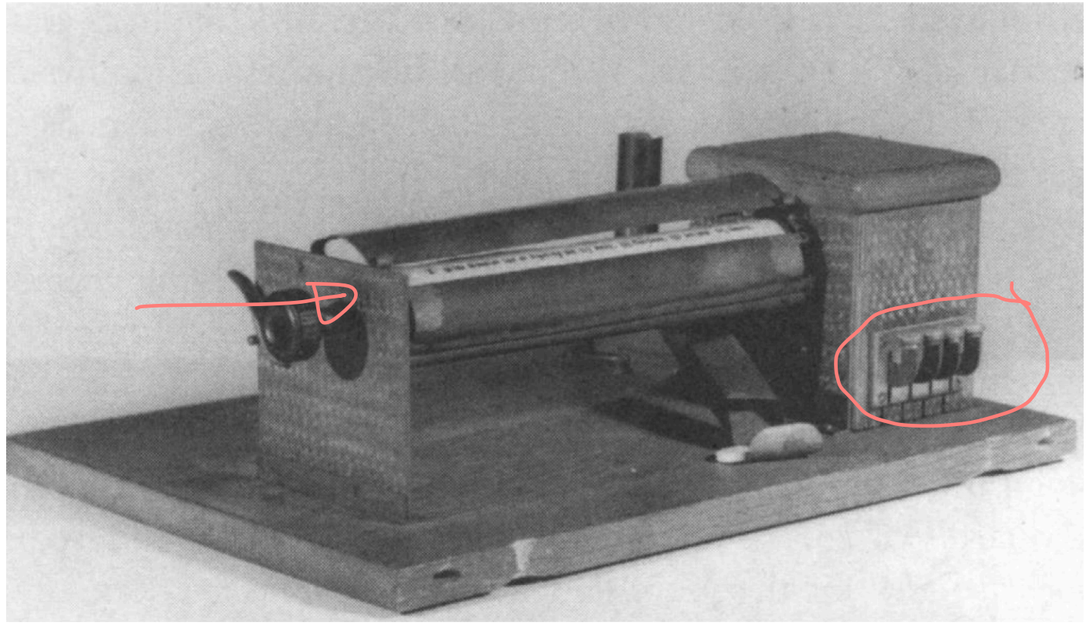
Definition: The *study* and ethical *practice* of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources.[2]

[1] Image source

[2] Richey, 2008, Reflections on the 2008 AECT Definitions of the Field

Some history: ***Milestone 1:*** *Teaching machines*[3]

Mechanical devices, first developed in the 1920s by Sidney Pressey, presented educational materials and taught students. Early machines administered tests involving sequential multiple-choice questions.



[3] Petrina, 2004, Sidney Pressey and the Automation of Education, 1924-1934

Some history: ***Milestone 2:*** *Programmed learning*[4]

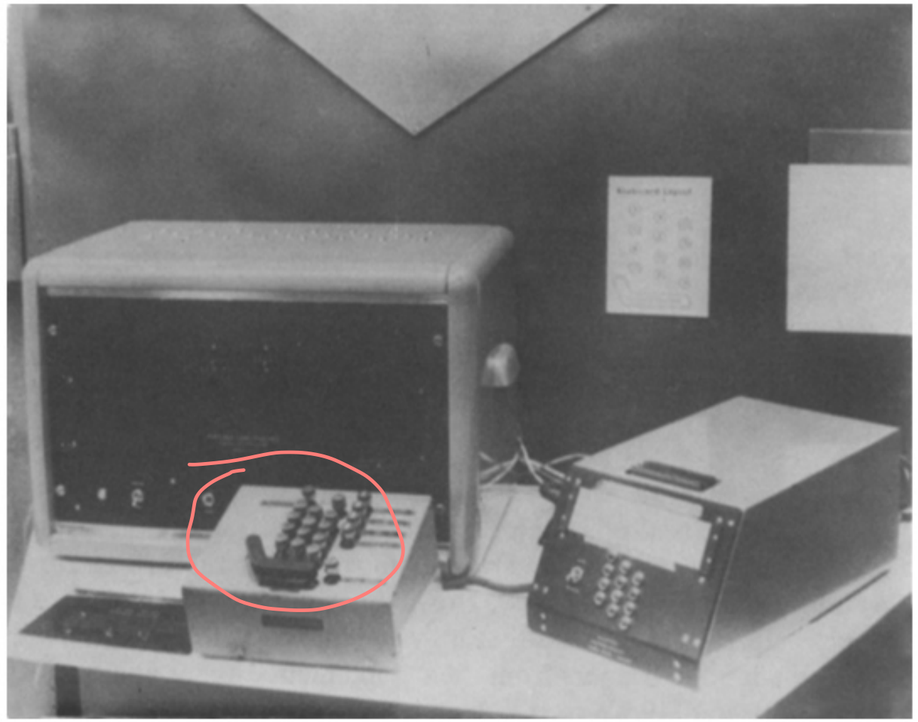
Teaching machines, developed by B. F. Skinner in the 1950s, directed at a broad range of students on a broad set of topics that provided positive reinforcement to facilitate learning.

[4] Image source

teraction | **Professor Mutlu | Week 09:** Seminar: ***Educational Technology***

Some history: ***Milestone 3:*** *Adaptive teaching machines*[6]

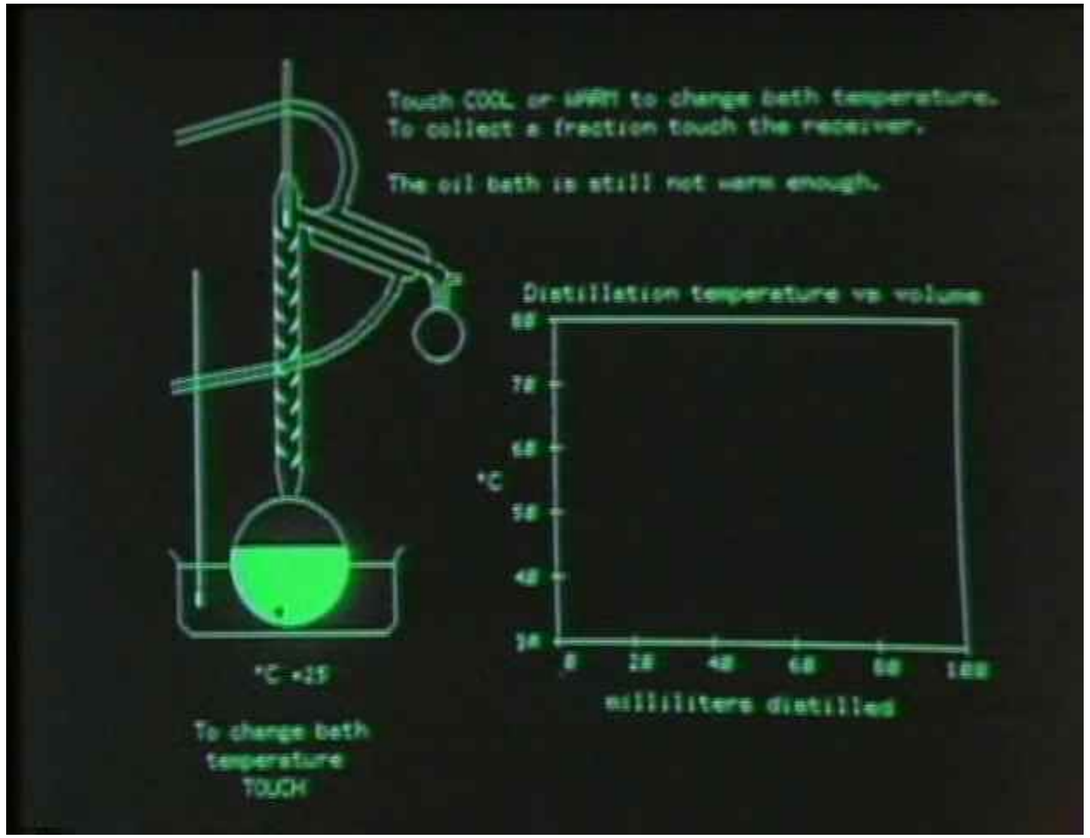
Adaptive teaching machines, e.g., self-adaptive keyboard instructor (SAKI) developed by Gordon Pask in 1956, adjusted questions to the accuracy and response time of the student.



[6] Watters, 2015, Gordon Pasks' Adaptive Teaching Machines

Some history: ***Milestone 4:*** *Computer-aided learning*[7]

Generalized computer-assisted instruction systems, e.g., the PLATO system developed at UIUC in the 1960s, offered comprehensive instruction on a range of topics.



[7] Image source)

PLATO

CHANGING HOW THE WORLD LEARNS

Some history: ***Milestone 5:*** *Educational programming*[9]

Computer programming and robotics are used as learning instruments, e.g., to teach proceduralization, debugging, etc. Logo and Turtle were developed by Seymour Papert in 1967.

[9] Image source

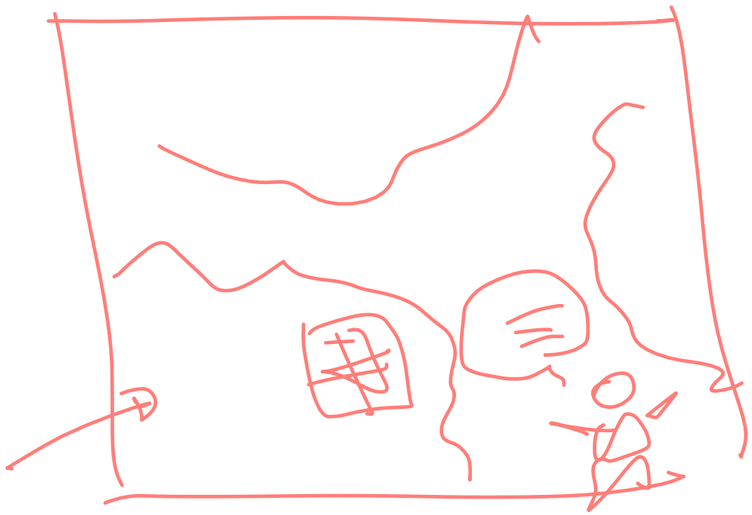
Some history: ***Milestone 6:*** *Pervasive use of computer-aided learning*[10]

Pervasive, personal computers designed for education at schools and at home, such as the BBC Micro released in 1981.

[10] Wikipedia: BBC Micro

Some history: ***Milestone 7:*** *Online learning*

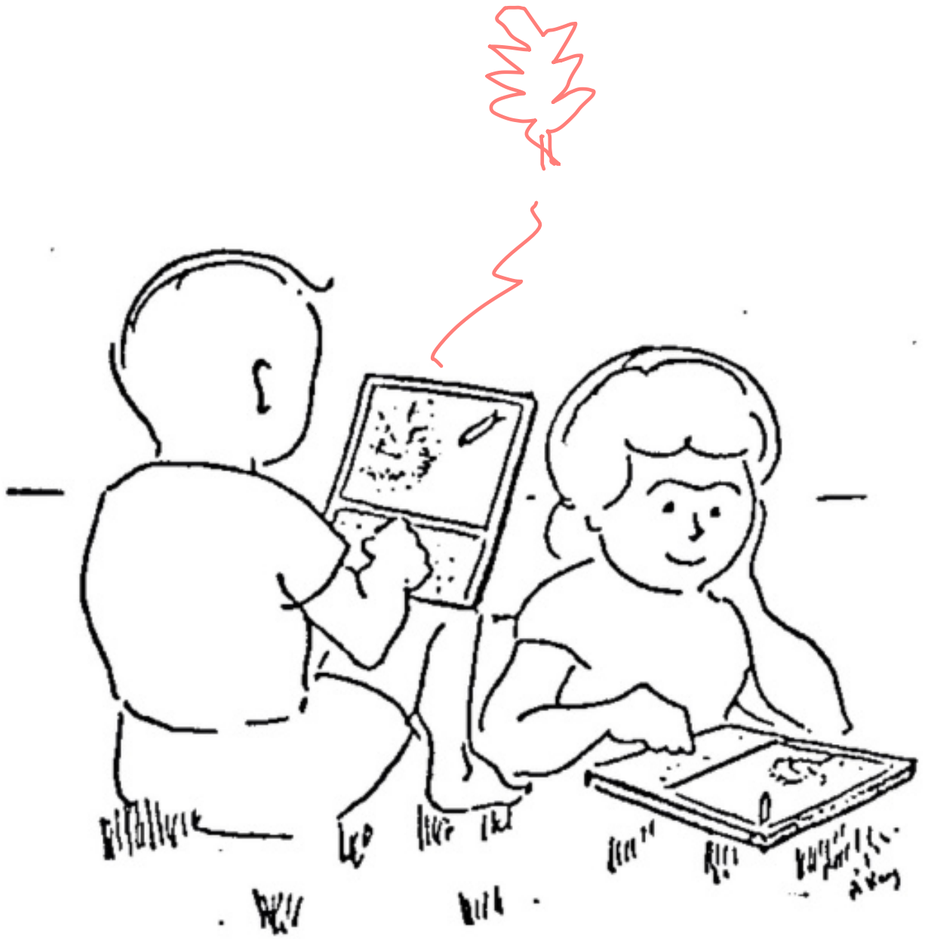
Virtual learning environments (VLEs), such as the Strathclyde Personal Interactive Development and Educational Resource (SPIDER) began in 1998,[11] provide a complete environment that facilitates learning management.



[11] Wikipedia

Some history: ***Milestone 8:*** *Mobile learning*

Mobile learning, or m-learning, involves learning across multiple contexts, through social and content interactions, using personal electronic devices[12]. Earliest concept was Alan Kay's Dynabook.[13]



[12] Crompton, 2013, A historical overview of mobile learning: Toward learner-centered education

[13] Image source

Discussion Questions

- Where are educational technologies today? What technologies do you use?
- How does design-based research fit within the history of educational technology?
- Where are educational technologies going? What are the most important challenges they must address?
- What external resources did you find that might add to our discussion?
- ...