



# Re-Thinking E-Learning Research

Foundations, Methods,  
and Practices

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# Overview

- History of the term; recent definitions
- Disciplines related to e-learning
- Psychology as foundational
- E-learning research and development: what is it and how does it relate to practice?

# History of the term

- first used in the mid 1990's as a shortened form of "Electronic learning" (OED, 2007).
- not only a kind of learning, but practices in education, teaching, design and research
- has come to represent a useful shorthand for a range of different orientations to research and to the use of technologies in education and learning.

# Adaptability of the Term

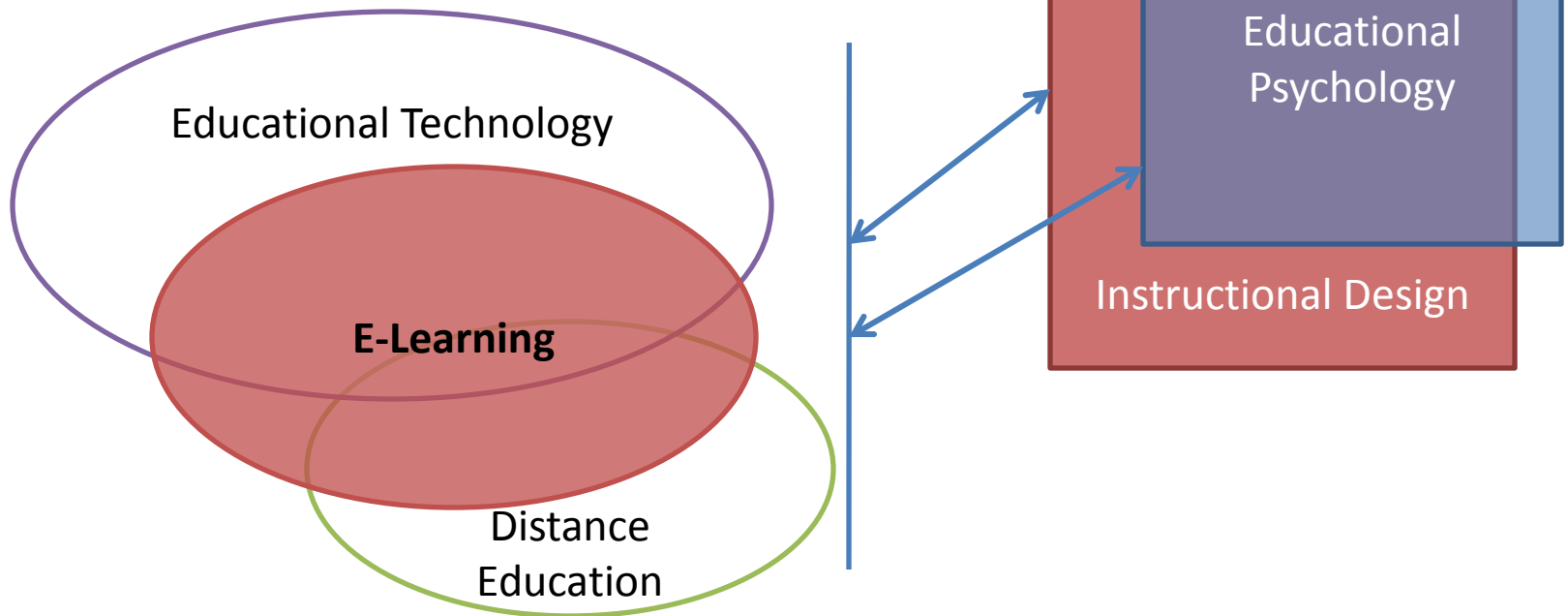
- E.g. Richard E. Mayer & Ruth Colvin Clarke: *e-Learning and the Science of Instruction* “e-learning should promote psychological engagement between the learner and the lesson content in ways that help learners to select, integrate, and retrieve new knowledge”
- E.g. D. R. Garrison & T. Anderson: *E-Learning in the 21<sup>st</sup> Century* "unique ability to bring together a community of learners, unrestricted by time or place"

# Recent Definitions

- "can be defined as the use of information and communication technologies (ICTs) to facilitate and enhance learning and teaching" (Koper, 2007, p. 356).
- "marshals computer and network technologies to the task of education," as (2007, p. 1)
- Internet, especially the Web; Web technology continues to change; e-learning 2.0, edupunk

# Related disciplines

## Educational Disciplines Generally



# Psychology

Three psychological paradigms or “learning theories:”

- **Behaviourism:** 1920’s to 1960’s. Psychology studies behaviour in terms of stimulus and response; teaching & learning = conditioning
- **Cognitivism:** 1960’s to 1990’s. Psychology studies the mind as a computer; teaching & learning = helping with info. processing and representation
- **Constructivism:** 1990’s to 2010(?). Psychology studies processes of individual and social construction. teaching & learning = knowledge construction.
- **Future:** “Functional contextualism?” eclecticism? Connectivism“?”

# New Pedagogies/Learning Theories

- **Learning Sciences:** use design-based & multiple research methods to understand learning in terms judged by standards of “natural science:” cognitivism, brain science
- **Connectivism:** the thesis that knowledge is distributed across a network of connections
- **Constructivism/Cognitivism:** knowledge is constructed as representations in the mind through cognitive and social processes



# What is common to these theories?

1. Tendency to appeal to natural science and experimental methodology as “the” way of developing theory
2. Reference to technological metaphors as basis for theory
  - Electrical networks; information processing & representation; Neural networks; nodes & networks;
3. Understanding of technology as an instrument
4. Basic premise that there is ONE way of knowing

# E-Learning Practice

- Applying psychological principles to instructional tasks and situations involving Web/Internet technologies
- Understanding the most recent technological developments and how they impact teaching and learning
- Designing and implementing learning environments and experiences to be as effective/efficient as possible

# E-Learning Research & Development

Develop new *technological knowledge*, methods and artifacts specifically with the aim of improving "**learning, training and teaching**" by making them

- more *accessible* to every-one at any place and at any time
- more *effective* by facilitating the implementation of advanced pedagogical and organizational approaches,
- more *efficient* by providing advanced (partly automated) support mechanisms for learners and teachers to perform their various tasks (Koper, 2007, p. 356).

# E-Learning Research & Development: Habermas' Knowledge Types

Interest	Knowledge	Medium	Science
Technical	Instrumental (causal explanation)	Work	Empirical analytical or natural sciences
Practical	Practical (understanding)	Language	Hermeneutic or "interpretive" sciences
Emancipatory	Emancipatory (reflection)	Power	Critical sciences

Carr & Kemmis, 1986, p. 136

# Consequences for e-learning

- Education and the use of technology in education as having emancipatory potential
- Technical knowledge as important, but only one of three knowledge types
- Practical knowledge: “Practice” has its own kind of knowledge. It is not just the implementation of “technological” knowledge.
- Practice then becomes an area of importance, for research and discussion of its own

# Consequences for Practice

- Practice is an important issue in itself; it is not just the (more-or-less) accurate implementation of a theory or design
- It needs to be studied, and considered on its own: especially **pedagogical** practice
- It has an authority over theory; speaks a different “language” than theory
- “Practice has a logic which is not that of the logician” (Pierre Bourdieu, 1980)

# Everyday versus “Expert” Knowledge

- Knowledge ordered according to subjective significance
- Unsystematized knowledge
- Routine activity
- Reality as indubitably given
- Avoidance of doubt
- Ordered according to paradigmatically-grounded criteria
- Systematized knowledge
- Reflected methodical activity
- Questioning the conditions for understanding “reality”
- Systematization of doubt

# Everyday versus “Expert” Knowledge

- Safeguarding of what is known
- Avoiding alternatives
- Concentration on one meaning
- Based on everyday praxis
- Pragmatically motivated
- Vocabulary is close to experience
- Oral
- Doubting what is known
- Looking for alternatives
- Multiple meanings expected
- Systematically separate from it
- Theoretically motivated
- Vocabulary is distanced from it
- Written



# Technology drives Educational Change

- Technology or technological change *impact* education
- Technology as a disruptive force
- Laws of technological change:
  - “tipping point”
  - “Moore’s Law”
  - “Kurzweil’s Law”



# Encoded in Research Designs

## **Rogers' "Dissemination of Innovation" Model:**

- Technology disseminated through a population
- Technology as pre-given in its uses, design, purposes, functions, etc.
- technology as a kind of "unmoved mover," decisively influencing education from the outside
- Adoption and resistance as the only responses
- Implied values: "early adopters" "mainstream" or "laggards."

# Encoded in Research Designs

- quasi-experimental designs that define technology as a treatment or control
- Measure its educational effects or outcomes
- produces results deemed either controversial, inconclusive or as “fatally flaw[ed]” (Bernard et. al. 2004; Russell, 1997)
- In both cases, the question as to why we have the technologies we do, is unanswered, and unasked.

# Technological Determinism

- *technological determinism*: “the belief that social progress is driven by technological innovation, which in turn follows an ‘inevitable’ course.”  
Smith, 1994, p 38; also  
<http://www.aber.ac.uk/media/Documents/tecdet/tecdet.html>
- “optimistic” *hard* determinism: “the advance of technology leads to a situation of inescapable necessity [with the future being] the outcome of many free choices and the realization of the dream of progress...” (Marx & Smith, 1994; xii).

# Counter-Examples

- “progress” can sometimes fail, or be stopped dead in its tracks
- The persistence of the classroom as a site of educational practices
- The Web as being modified and adapted for education: WebCT or Moodle, Blogs & Wikis
- adaptation has occurred in a manner that seems to have had the end effect of *reinforcing* rather than disrupting many conventional educational practices and organizations.

# Alternatives

- “Empower” users; place designers in dialogue
- Focus on practices and practitioners (not design, development) and the way they end up adapting the technology to their needs
- active end-user “domestication,” “taming,” or appropriation of the technology (Silverstone & Hirsch, 1992; Pinch & Outershoon, 2004).
- Study technology design processes; “technology in the making” (ANT)

# At the same time....

- It is important to recognize that technological designs and developments can bring their own agenda with them.
- E.g. Of the design of WebCT and Moodle tools, accounts and roles