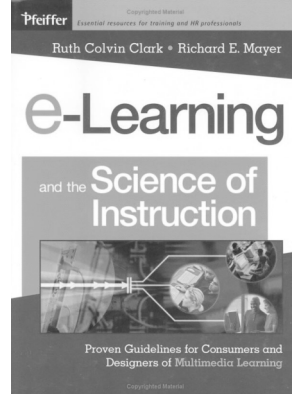


# Educational Software Design Principles A Brief Overview



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## Acronyms

- CBT - Computer Based Training
- CAL - Computer Assisted Learning
- Remote learning / Distant Learning
- Multimedia Learning
- E-Learning

## First application of E-Learning

- Mainframe training
- Electronic version of B.F. Skinner's teaching machine - Q&A



## What is E-Learning?

- "Training delivered on a computer (including CD-ROM, Internet, or intranet) that is designed to support individual learning or organizational performance goals"
- Nowadays should also include PDAs / iPods / Smart phone

## What is E-Learning?

- Includes content relevant to the learning objectives
- Uses instructional methods such as examples and practice to help learning
- Uses media elements, such as words and pictures/animations to deliver the content and methods
- Builds new knowledge and skills linked to individual learning goals or to improved organizational performance

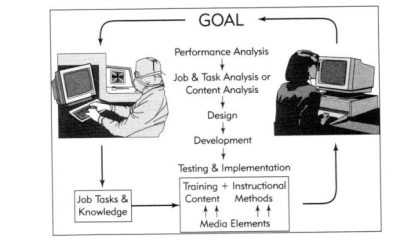
## E-Learning

Content

Delivery +  
Instructional methods

## E-Learning Development Process

Figure 1.1. The Process of e-Learning Design to Improve Organizational Performance.



## Types of E-Learning Goals

- Inform
  - To provide information or build awareness
  - e.g. chemotherapy induced cardiomyopathy
- Perform
  - To build specific job-related skills
  - e.g. how to perform cardiac auscultation

## Two Types of E-Learning Perform Goals

- Near Transfer
  - Step-by-step tasks, performed more or less the same way
  - e.g. how to do a bone marrow/pleural tap
- Far Transfer
  - To teach tasks that do not have only one correct approach or outcome
  - Requires user to adapt guidelines to various job situation
  - e.g. ACLS, ACS guidelines

## Is E-Learning Better?

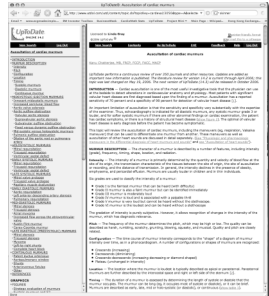
- Waves of instructional delivery technology
- 1920 Films
  - 1947 First media comparison study
    - US Army - Film vs. traditional classroom vs. paper-based versions on reading a micrometer
    - No difference in learning

## Is E-Learning Better?

- "Greater complexity of media does not necessarily ensure more learning."
- "It is not the medium, but rather the instructional methods that cause learning."
- Different medium offers unique opportunities to deliver instructional methods that other media cannot

## A Common Mistake In E-Learning

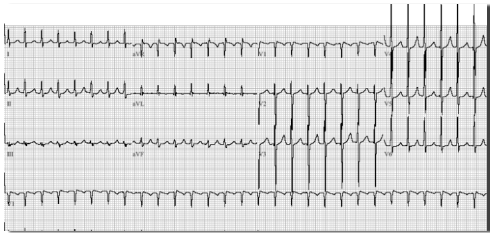
- To design each new medium to mirror older one



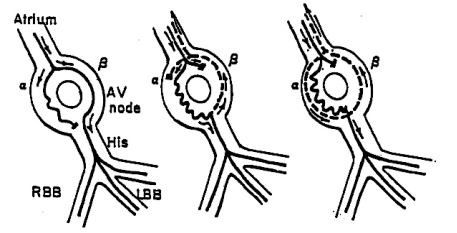
## A Common Mistake In E-Learning

- To exploit the media fully, the unique capabilities of the delivery media should be used in ways that effectively support human learning

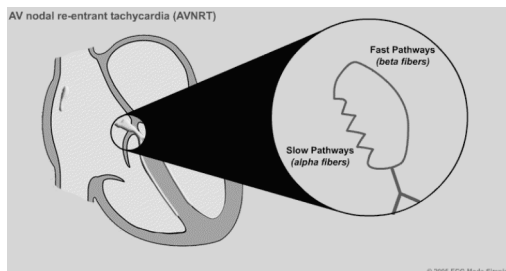
## To Avoid Common Mistake In E-Learning



## To Avoid Common Mistake In E-Learning



## To Avoid Common Mistake In E-Learning



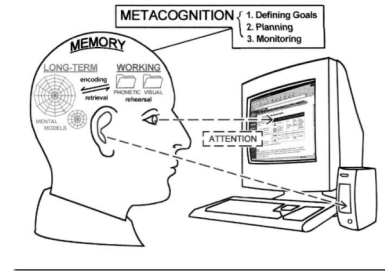
## E-Learning

- Take advantage of the unique aspects of the electronic media ...
  - Customization
  - Animation
  - Interaction
  - Practice with automated feedback
  - Collaboration (emails, online chats, forums)
  - Simulation to accelerate expertise

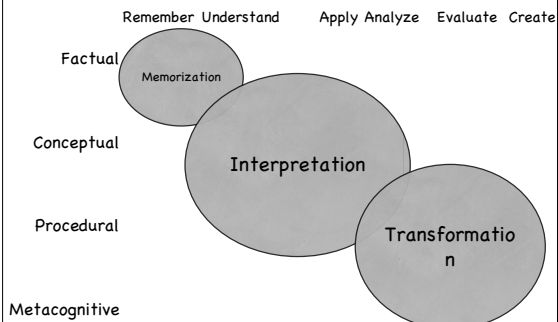
## E-Learning Pitfalls/Barriers

- Failure to define job knowledge and skills
  - Lessons do not build knowledge and skills that transfer to the job
- Lack of job context risks transfer failure
- Failure to accommodate learning processes
  - Not accommodate human psychological processes
  - Lessons that does not exploit tech capabilities
- Attrition

Figure 2.1. Cognitive Processes Involved in e-Learning.



## E-Learning



## What is Good E-Courseware

- Know your training goals
  - Inform, perform (near and far transfer)
- Respect learner differences
  - Prior knowledge, learning styles
- Training environment
  - Technical constraints, cultural factors, budget, time, institution expectations