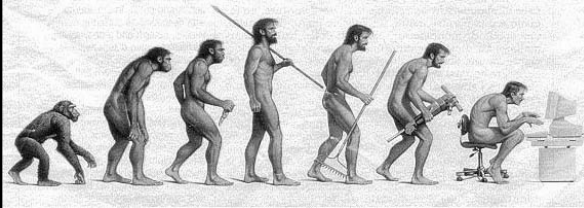# E-learning in Education

Technology

Access to information
and knowledge base

- all necessary info is at the fingertip
- the wealth of additional "readings"
- carry on knowledge base
- ubiquitous access

example

Asynchronicity

- e-mail
- newsgroups and fora (forum)
- recordings
- teleconferencing

Global workgroup

- collaboration
- discussion
- peer review

Global teachers

- simply the best
- recorded
- asynchronous
- synchronous
- teacher to many
- teacher to one

example

Virtual experiments

- impossible experiments
- dangerous experiments
- time compression and expansion
- unlimited experiments at no cost

- access to real labs

example

Self-examination

- iterative verification of knowledge
- periodical re-check
- comparison with other learners
- feedback to developers

example

Fully integrated
self-paced learning tools

- programmed learning
- self paced
- self-examination
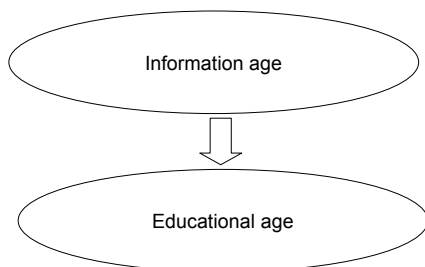- feedback to developers

example

Technology benefits

- access to information
- asynchronicity
- global workgroup
- global teachers
- virtual experiments
- self examination
- fully integrated
  self paced learning tools

Technology
Society

Society of tomorrow

Information age

Educational age

Society of tomorrow

- projects vs. companies
- freelance vs. employment
- interdisciplinary & multidisciplinary

- new definitions of:
  - speed:
    - moving at the speed of thought
  - distance:
    - only a keystroke away
  - essence:
    - "digitaliso ergo sum"
      - "he who ain't digital, does not exist"

Learning requirements

- learning for performance
  - not for a degree
- learning "just enough"
- learning fast
- learning now
- consultancy, coaching and mentoring
- self verification of acquired knowledge and skills

Technology
Society
Learning

Learning today

Learning theories

- Behavioral
- Cognitive
- Constructivist

Cognitive domain

- **Bloom's Cognitive taxonomy** (1956):

  – knowledge
  – comprehension
  – application
  – analysis
  – synthesis
  – evaluation

- **Gagne's Taxonomy of Learning** (1972):
  - verbal information
  - intellectual skill
  - cognitive strategy
  - attitude
  - motor skill

Affective domain

- **Receiving**
  - show awareness of class proceedings
- **Responding**
  - willingly answer questions.
- **Valuing**
  - express strong opinions on issues under discussion.
- **Organization**
  - criticize arguments and positions presented in class
- **Value Or Value Complex**
  - demonstrate a philosophy of life by the consistency of his or her daily actions.

Psychomotor Domain

- **Imitation**
  - early stages in learning a complex skill,
  - repeating an act that has been demonstrated or explained
  - includes trial and error until an appropriate response is achieved.
- **Manipulation**
  - practice a particular skill or sequence until it becomes habitual
  - the action can be performed with some confidence and proficiency.
  - the learner still isn't "sure of him/herself."
- **Precision**
  - skill has been attained.
  - quick, smooth, accurate performance, requiring a minimum of energy
- **Articulation**
  - The skills are so well developed that the individual can modify movement patterns to fit special requirements or to meet a problem situation.
- **Naturalization**
  - response is automatic.
  - begins to experiment
  - One acts "without thinking."

"Classic" vs. Mastery model

- **classic model**
  - all students are given the same amount of time to learn
  - the focus is on differences in ability
  - based upon theories of intelligence
- **mastery model** (Carroll 1989)
  - focus of instruction should be the time required for different students to learn the same material
  - providing enough time and employing instructional strategies so that
  - all students can achieve the same level of learning

1. clearly specifying what is to be learned and how it will be evaluated,
2. allowing students to learn at their own pace,
3. assessing student progress and providing appropriate feedback or remediation,
4. testing that final learning criterion has been achieved.

Motivation

- Anxiety
- Arousal
- Attention
- Attitudes

Myers-Briggs Type Indicator (MBTI)

- Extraversion (E) versus Introversion (I)
- Sensing (S) versus Intuition (N)
- Thinking (T) versus Feeling (F)
- Judging (J) versus Perceptive (P)

Extraversion (E) versus Introversion (I)

- **Extraverted**
  - learn by explaining to others
  - enjoy working in groups
  - Thinking Aloud Paired Problem Solving (TAPPS) method
  - Nominal Group Method

- **Introverted**
  - want to develop frameworks that integrate or connect the subject matter.
  - disconnected chunks are not knowledge, merely information
  - knowledge means interconnecting material and seeing the "big picture."
  - teach how to chunk, or group and interconnect knowledge
  - teach how to build a compare/contrast table, flowchart, or concept map

Sensing (S) versus Intuition (N)

- Sensing
  - are detail oriented, want facts, and trust them
  - prefer organized, linear, and structured lectures
  - what must be known
  - application-theory-application

- Intuitive
  - seek out patterns and relationships among the facts they have gathered
  - trust hunches and intuition and look for the "big picture"
  - must have the big picture
  - prefer the traditional Theory-Application-Theory or
  - the A-T-A approach using discovery learning.

Thinking (T) versus Feeling (F)

- **Thinking**
  - value fairness
  - focusing on the situation's logic
  - placing great weight on objective criteria in making a decision
  - like clear course and topic objectives
  - objectives are precise and action-oriented

- **Feeling**
  - value harmony
  - focus on human values and needs as they make decisions or arrive at judgments.
  - good at persuasion and facilitating differences among group members
  - like working in groups, especially harmonious groups
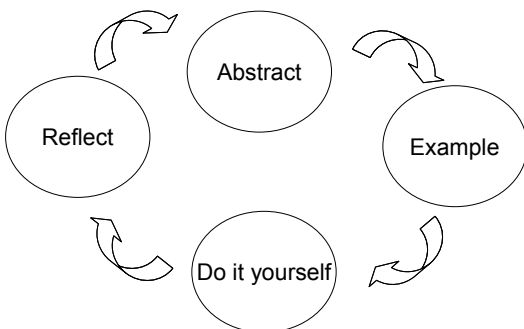 - enjoy the small group exercises

Judging (J) versus Perceptive (P)

- Judging
  - are decisive, planful and selfregimented
  - focus on completing the task, only want to know the essentials, and take action quickly (perhaps too quickly)
  - plan their work and work their plan
  - Deadlines are sacred
  - Their motto is: just do it!

- Perceptive
  - are curious, adaptable, and spontaneous
  - They start many tasks, want to know everything about each task, and often find it difficult to complete a task.
  - Deadlines are meant to be stretched.
  - Their motto is: on the other hand ... .

Learning by …

Reading	Listening
Writing	Talking

Phases of learning

Reflect → Abstract → Example → Do it yourself → (back to Reflect)

Technology + Society + Learning

=

Process

Keep in mind

Input

Content

Technology

Process

Student

$f_{(input)}$

Output

Role

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