MLT803(903)/MID834/MPS803(903): Technologies as Cognitive Tools

Dr. Wang Qiyun

Outline for Today

- Course objectives, outline and admin issues
- Platforms/tools
- Related concepts and theories
- Cognitive tools & productivity tools
- Break
- Hands-on

Course objectives

Participants should be able to:

- Analyze the affordances and demonstrate strategies to use appropriate cognitive tools to enhance learning in specific subject areas/domains;
- Select appropriate cognitive tools for learning; be able to justify the choice of tools in relation to classroom learning problems and assess the effectiveness of the implementation;
- Consider issues related to the integration of cognitive tools into teaching and training.

Main topics

- Definition of cognitive tool
- Affordances of technologies as cognitive tools
- Concept mapping
- CSCL
- Modeling
- Mobile learning
- VR/AR
- Emerging ICT tools as cognitive tools
- (Group project consultation and presentation)

Features of the course

- Blended learning approach
  - Face-to-face
  - Online
    - Video conferencing (synchronous)
    - Individual learning (asynchronous)
- Blended synchronous learning

Schedule

- 13 weeks
  - 10 face-to-face (F2F) sessions
  - 2 fully online sessions
    - CNY (08/2): Tools sharing
    - Concept mapping (01/3)
  - 1 online learning + video conferencing (1h) session
    - Model building
  - 7 individualized BSL sessions
    - Choose 2 sessions of no more 6 online participants
- Theory + Practice

Course evaluation

- Individual reflections (10%*3)
  - What have you learned? (5%)
  - How to apply what you have learned into your teaching and training? (5%)
  - About 500 words
  - Completed by the mid-night of the following Tuesday
- Group assignment (30%)
  - In groups of 3-4
  - Lesson ideas
  - Use the template provided
  - 2-3 IT cognitive tools should be involved
  - Design and description of learning activities (15 marks)
  - Justification: How the affordances of the tools help to support the implementation of the learning activities and achievement of the learning objectives (10 marks)

Course evaluation

- Participation (10%)
  - Class interaction
  - Online activities
- Online learning and discussion
  - Creating a concept map (10%)
  - Online sharing and discussion (20%)
- More information
  - Refer to the course syllabus and rubrics

Platforms

- Blackboard: http://lonline.nie.edu.sg
  - Validate email
  - Send mass emails
- Weebly: http://cogtools.weebly.com/
- Video conferencing system: www.zoom.us

3AU/4AU

	3AU	4AU
Each F2F session	• Read the online materials	• Read the online materials • Online discussion: give at least 2 comments and 1 reply on the websites
Online session: tool sharing	• Create a video of about 15 minutes	• Create a video of about 20 minutes
Online session: Concept mapping	• At least 40 nodes	• At least 50 nodes
Online session: Modeling	• Read online materials and do online activities	• Read online materials and do online activities • Online discussion: 2 comments and 1 reply

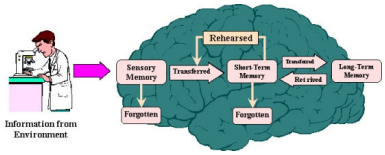
- Getting to know others
- Upload to Weebly web site (including sit-ins)

What is cognition?

- Cognition is a term referring to the mental processes involved in gaining knowledge and comprehension, including thinking, knowing, remembering, judging and problem-solving. These are higher-level functions of the brain and encompass language, imagination, perception and planning
  http://psychology.about.com/od/cindex/g/def_cognition.htm
- Cognition is the scientific term for "the process of thought" http://en.wikipedia.org/wiki/Cognition

Cognitive Psychology

- STM→LTM



- Cognitive Load Theory

Behavioral Psychology

- Skinner's Stimulus-Response

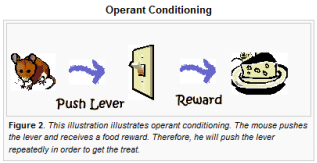


Figure 2. This illustration illustrates operant conditioning. The mouse pushes the lever and receives a food reward. Therefore, he will push the lever repeatedly in order to get the treat.

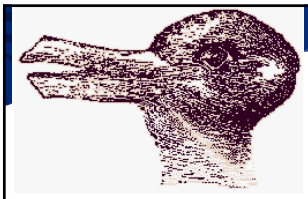
Objectivism vs. Constructivism

- What are objectivism and constructivism?
- What are the basic beliefs of objectivism and constructivism?
- What is the difference between them?

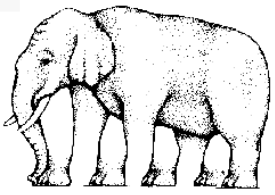
Objectivism

- The role of educators is to help students learn the real world.
- Students are not encouraged to interpret what they see and perceive; it is the role of teachers or institutes to interpret it.
- Students are told about the world and are expected to replicate its content and structure in their thinking.

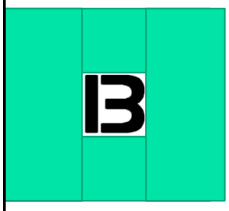
http://www.aynrand.org/objectivism/io.html



Constructivism



Constructivism



http://www.coolopticalillusions.com/

Constructivism

- Basic assumptions:
  - The reality is more in the mind of the knower
  - Knower constructs a reality based on his/her experiences.
  - We all conceive of the external reality somewhat differently based on our unique set of experiences
  - Constructivists emphasize authentic tasks in a meaningful context rather than abstract instruction out of context.

http://carbon.cudenver.edu/~mryder/itc_data/constructivism.html

What are cognitive tools?

- Activity: 15 mins
- Extract email addresses (as many as possible) from the txt file and put them into an excel file

What are cognitive tools?

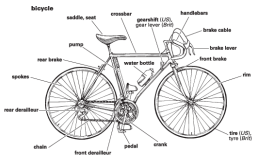
- Productivity tool

What are cognitive tools?

- Activity 2: 20 mins
- Retirement Estimator: How much do you need for your retirement?
- https://www.cpf.gov.sg/eSvc/Web/Schemes/RetirementEstimator/RetirementEstimatorLanding

What are cognitive tools?

- Cognitive tools vs productivity tools



What are cognitive tools?

- What is the difference/relationship between productivity tools and cognitive tools?

- Kirschner & Erkens (2006): Cognitive tools and mindtools for collaborative learning
- Hmelo-silver (2006): Introduction: cognitive tools for collaborative communities

- Problem: There is a long list of references in the APA format. Now it needs to be changed into another format (e.g. Harvard). How?

- Barron, B. (2000). Achieving coordination in collaborative problem-solving groups. *Journal of the Learning Sciences, 9*(4), 403-436.
- Bera, S., & Liu, M. (2006). Cognitive tools, individual differences, and group processing as mediating factors in a hypermedia environment. *Computers in Human Behavior, 22*(2), 295-319.
- Ilyoshi, T, & Hannafin, M. (2002). *Cognitive Tools and User-Centered Learning Environments: Rethinking Tools, Functions, and Applications.* Paper presented at the World Conference on Educational Multimedia, Hypermedia and Telecommunications 2002, Denver, Colorado, USA.

- Barron, B. (2000). "Achieving coordination in collaborative problem-solving groups." Journal of the Learning Sciences **9**(4): 403-436.
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Video Conferencing Platform

- Zoom.us Meeting
  - https://www.zoom.us/j/7767730553

For online students

- Get ready10 mins before the lesson starts
- Use mic and camera
- Mute your mic by default
- Don't turn off your camera
- Behave as in the classroom
- Indicate your engagement

For online students

- Indicate your engagement
- Download the Pollev app, or
- https://pollev.com/qiyunwang619
- Respond within a minute

- Choose which session to join via video conferencing: http://bit.ly/vcJan19

Hands-on: Diigo

- Diigo: https://www.diigo.com/
  - Sign up/sign in
  - Add bookmark, images, notes
  - Create lists
  - Download the diigolet
    - Explore: highlight, sticky note, and share
- Share:
  - How can Diigo be used as a cognitive tool?

Reminder for next session

- Characteristics and various types of cognitive tools