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Collaborative Peer Learning Supports Cognitive Affordances of Technologies

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PEER LEARNING RESEARCH

History of Peer Learning

- **Patterns of Learning**
- **Metacognition and Peer Learning**
- **Active and Passive Learning**

Bloom's and other Taxonomies

- **Filling in the Gaps**
- **Fitting in Peer Learning**

Peer Learning and the Online Modality

For the things we have to learn before we can do, we learn by doing.

- Aristotle



IMPLEMENTING PEER LEARNING IN ORG 6300 – HUMAN DEVELOPMENT

Planning: Michael and Kristin met and shared materials on the peer learning approach.

Researching/Analyzing:

- Discussed the need for peer learning to be implemented.
- Discussed how to introduce peer learning opportunities.
- Reviewed the scaffolding of content through peer learning.

Collaborating/Designing:

- Kristin and Michael collaboratively constructed ORG 6300.
- Identified approximately 6-10 opportunities for peer learning.
- Material built week by week through ongoing discussions.
- Scaffolding student knowledge through the 6 week, asynchronous format.



PEER LEARNING – INSTRUCTOR PERSPECTIVE

CHRONOLOGY/PROCESS:

Teaching:

- Taught the course independently to two different cohort groups simultaneously.
- Consulted regularly with Michael to report obstacles, issues, concerns, and successes.

Evaluation:

- Re-evaluated, revised as needed and taught the course again.



TEACHING PEER LEARNING IN ORG 6300

Struggles as an Instructor:

- Student Issues
- Course Material Issues

Successes as an Instructor:

- Student Successes
- Course Successes



CATS: A TOOL FOR IDENTIFYING THE COGNITIVE AFFORDANCES OF LEARNING TECHNOLOGIES

CATS includes seven multi-disciplinary research supported categories of cognitive affordances that can be harnessed to enrich student learning experiences in technology supported learning environments: experiential learning, discourse or dialogic learning, supportive learning, learn by doing, critical thinking, conceptual change, and self-regulated learning. Each category contains a list of cognitive criteria and each criterion is operationally defined and cited.

October 2013 AECT presentation by Nada Dabbagh, Professor & Director
Division of Learning Technologies at the College of Education and Human
Development George Mason University and Susan
Dass, PhD Candidate, George Mason University



Cognitive Affordances

Cognitive Affordance	TSLE Affords (Also, a Definition)	In-Text Citation/
Authentic Learning	Learners engage in tasks that have "real world relevance and utility, that integrate across the curriculum, that provide appropriate levels of complexity, and that allow students to select appropriate levels of difficulty or involvement"	Herrington, Oliver
Ill-Defined Dilemmas	Learners engage with dilemmas that must be either ill-defined or defined loosely enough so that students can impose their own problem frames	Jonassen & Land,
Multiple Perspectives	Learners evaluate and negotiate varied sources of meaning in order to form new knowledge	Jonassen & Land,
Multiple Representations	Learners deal with material from different perspectives and with different strategies in order to construct coherent knowledge structures.	Seufert, 2003, p. 2
Open-Ended Tasks	Learners devise different plans, explore multiple paths, and come up with legitimately different solutions that are either well or loosely defined	Lotan, 2003, p.72
Situated Learning	Learners are placed in a setting replicating culturally authentic contexts and activities	Alnuaim, Caleb-S
Experiential Learning	Learners go through a process whereby knowledge is created through experience	Kolb, 1984, p. 38
Cognitive apprenticeship	Learners learn in a real-world context and are encouraged to engage in meaningful and purposeful activities by being invited into the actual practice as an apprentice or intern.	Dabbagh & Banna

- Experiential Learning,
- Discourse/Dialogic Learning,
- Supportive Learning,
- Learn By Doing,
- Critical Thinking,
- Conceptual Change,
- Self-Regulated Learning



EVALUATING ORG 6300 WITH CATS

Michael and Kristin reviewed ORG 6300 to determine cognitive impact.

Evaluated CATS applicability to University of Rockies courses:

- **Modifications to CATS**
- **Modified categories and observations**

Discussed the impact of peer learning.



MODIFYING CATS

Eliminating or consolidating elements:

- Goal Setting
- Time Management
- Motivation
- Decision Making - redundant
- Cognitive Analysis - redundant

Learning elements that can be improved through CATS:

- Experiential
- Discourse/Dialogic
- Supportive
- Application
- Critical Thinking
- Conceptual Change
- Self-Regulated



INSTRUCTOR REFLECTIONS

PEER LEARNING & CATS IN ORG6300

- Reflection 1: Experiential learning
- Reflection 2: Discourse/Dialogue
- Reflection 3: Supportive
- Reflection 4: Learning by doing
- Reflection 5: Critical thinking
- Reflection 6: Conceptual Change
- Reflection 7: Self-Regulated Learning
- Reflection 8: My self-reflection of the process



CATS FOR COURSE DEVELOPMENT

Michael and Jodie shared our use of CATS with Dr. Dabbagh and her George Mason students.

- Discussed other ways that CATS could be used.
- Considered how the variety of activities and their associated cognitive affordances could lead to improved diversity of activities in courses.



MODIFIED CATS FOR COURSE DEVELOPMENT

Feedback from course review and the discussion with Dr Dabbagh was implemented.

- Activities were edited to reflect practices currently in use.
- The CATS document was reconstructed to be used as a development tool as opposed to evaluation tool.

The intent was to facilitate the designing of course activities based upon Cognitive Affordances.



MODIFIED CATS FOR COURSE DEVELOPMENT

Activity Types	Possible Applicable Blooms Levels	Cognitive Affordance Addressed	Definition of Cognitive Affordance
EXPERIENTIAL LEARNING			Experiential learning, also known as exploratory learning, is based on the... which learners are provided with a scientific-like inquiry or an authentic pr... hypothesis, gather relevant information using a variety of resources, and pr...
Scenarios	Application, Analysis, Evaluating	Problem Solving	Learners engage in a complex activity or project in which they organize idea... Planning, decision making and explanation are components of the problem... of actions, and analysis of results. It often starts with a driving question as...
Simulations, games, microworlds, decision trees	Application, Analysis, Evaluating	Hypothesis Generating	Learners predict an outcome from a number of possible actions based upon... processes - memory, thinking, evaluation, etc. Mapping the likely consequ... and developing alternative approaches or strategies for problem solving or... generalize their personal model to expert models for further refinement an...
DISCOURSE/DIALOGIC LEARNING			Dialogic learning emphasizes social interaction through discourse, dialogu...
Discussion forums, document sharing tools, communication tools	Comprehension, Application, Analysis	Collaboration	Collaboration or collaborative learning is the joint construction of knowled... advances the knowledge of the community and the individual within that c... advancing the knowledge of the individual as a contribution to the group p...
Blogs, peer evaluations, discussion forums	Application, Analysis, Evaluating	Reflection	An activity that gives cause for a student to analyze their state of knowledg... reflection, knowledge gaps can be identified for subsequent filling.
SUPPORTIVE LEARNING (INSTRUCTOR or SYSTEM INITIATED / DRIVEN)			Cognitive affordances initiated by the expert, coach, mentor, instructor, or e... desired performance, skills, or process, and observing and supporting learn...
Cognitive tutors, games, peer-learning	Comprehension, Application,	Coaching	Observing students while they execute tasks offering hints, challenges, fee... achieve expert knowledge or performance. Provide scaffolding in the learne...
Automated gated content (available as learning progresses), iterative & summative assignments	Comprehension, Application, Analysis	Scaffolding	Support provided to the learner to achieve cognitive goals within the Zone o... modeling a task or giving advice so the learner can engage in authentic act... conduct their own way through the task sequence.
LEARN BY DOING			Students apply the objective concepts and skills in a realistic activity which...
Student-relevant scenarios, peer teaching	Comprehension, Application,	Personally Relevant	Activities based on information that is personally relevant to the student w... by taking into account how they think about that domain.
Real-world scenarios or case studies	Comprehension, Application,	Authentic	Activities that allow students to think and act in accordance with the authe...

PEER LEARNING & CATS

Peer learning as one aspect of education.

Peer learning and the seven categories of cognitive affordances.

- **Experiential learning,**
- **Dialogic learning,**
- **Supportive learning,**
- **Learning by doing,**
- **Critical thinking,**
- **Conceptual change, and**
- **Self-regulated learning.**



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