The Impact of New and Emerging Technologies on Cognition in Online Learning Environments

NADD 2013
Laguna Beach, CA
Phil Ice, Ed.D.
A Little Context
eLearning...

- Is a market characterized by consistent, double-digit growth
- Provides a means to reach new groups of previously underserved learners
- Can leverage new technologies to increase learning outcomes
Then and Now

- Henry Block authored the eBang Theory for Montgomery Securities, Bank of America, in 1999
- Hype exceeded the ability to implement
- Only the names have change
Privacy can’t be assured and even if it could students might learn about the Pacific Northwest Tree Octopus.
Learning Management System’s are far removed from the way contemporary learners access and act on information, however, they can form the base.
Pedagogical Framework

Community of Inquiry

- Grounded in constructivist, collaborative learning theory.
- The COI is a validated instrument based on the research around Social, Cognitive, and Teaching Presence.
- More than 1 million learners have used this instrument and created a strong baseline for further research.
triggering event (sense of puzzlement)

exploration (sharing information & ideas)

integration (connecting ideas)

resolution (synthesizing & applying new ideas)
<table>
<thead>
<tr>
<th>Program Director:</th>
<th>University</th>
<th>Arts &amp; Humanities</th>
<th>Faculty Name</th>
</tr>
</thead>
<tbody>
<tr>
<td># COI Responses</td>
<td>43,669</td>
<td>8,204</td>
<td>167</td>
</tr>
<tr>
<td>Status</td>
<td>Goal</td>
<td>Goal</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>*Net Registrations</td>
<td>74,475</td>
<td>N/A</td>
<td>216</td>
</tr>
<tr>
<td>*Withdrawal %</td>
<td>5.37%</td>
<td>N/A</td>
<td>7.41%</td>
</tr>
</tbody>
</table>

1. The instructor clearly communicated important course topics. 4.45 4.46 4.21
2. The instructor clearly communicated important course goals. 4.47 4.47 4.21
3. The instructor provided clear instructions on how to participate in course learning activities. 4.43 4.43 4.26
4. The instructor clearly communicated important due dates/time frames for learning activities. 4.54 4.53 4.26
5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn. 4.28 4.27 3.86
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking. 4.29 4.28 3.83
7. The instructor helped to keep course participants engaged and participating in productive dialogue. 4.27 4.26 3.78
8. The instructor helped keep the course participants on task in a way that helped me to learn. 4.28 4.27 3.84
9. The instructor encouraged course participants to explore new concepts in this course. 4.35 4.35 3.92
10. Instructor actions reinforced the development of a sense of community among course participants. 4.24 4.22 3.88
11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn. 4.30 4.30 3.93
12. The instructor provided feedback that helped me understand my strengths and weaknesses. 4.24 4.23 3.72
13. The instructor provided feedback in a timely fashion. 4.29 4.27 4
14. Getting to know other course participants gave me a sense of belonging in the course. 3.92 3.90 3.93
15. I was able to form distinct impressions of some course participants. 4.00 3.99 4.04
16. Online or web-based communication is an excellent medium for social interaction. 4.00 3.97 4.13
17. I felt comfortable conversing through the online medium. 4.38 4.36 4.43
18. I felt comfortable participating in the course discussions. 4.40 4.38 4.41
19. I felt comfortable interacting with other course participants. 4.37 4.34 4.46
20. I felt comfortable disagreeing with other course participants while still maintaining a sense of trust. 4.30 4.27 4.35
21. I felt that my point of view was acknowledged by other course participants. 4.29 4.27 4.32
22. Online discussions help me to develop a sense of collaboration. 4.17 4.13 4.23
23. Problems posed increased my interest in course issues. 4.15 4.12 3.99
24. Course activities piqued my curiosity. 4.22 4.21 4.12
25. I felt motivated to explore content related questions. 4.26 4.26 4.14
26. I utilized a variety of information sources to explore problems posed in this course. 4.40 4.37 4.34
27. Brainstorming and finding relevant information helped me resolve content related questions. 4.28 4.25 4.24
28. Online discussions were valuable in helping me appreciate different perspectives. 4.11 4.07 4.15
29. Combining new information helped me answer questions raised in course activities. 4.29 4.26 4.27
30. Learning activities helped me construct explanations/solutions. 4.27 4.24 4.2
31. Reflection on course content and discussions helped me understand fundamental concepts in this class. 4.30 4.29 4.23
32. I can describe ways to test and apply the knowledge created in this course. 4.30 4.27 4.13
33. I have developed solutions to course problems that can be applied in practice. 4.26 4.22 4.04
34. I can apply the knowledge created in this course to my work or other non-class related activities. 4.33 4.31 4.16

*All net registration and withdrawal percentages are based on courses starting in 2009 and ending by 6/30/2009*
What is the reality?

Facebook Leads Sharing

Source: AddToAny

Follow the Chart Of The Day on Twitter: www.twitter.com/chartoftheday
I hate “Game Changer” but...
I can access my...
WARNING – Changing Times
Lots of static around analytics

Rebranding what we have been doing

Not visionary enough

Ignoring the realities in the corporate sector
If Amazon can, why can’t we?
v\n
For disenrolled students, last grade of F = 31% and last grade of W = 15% of that population.

4.0 GPA may be related to students transferring to other institutions. Represents 9% of disenrolled students.
Data has a limited lifespan in predictive analytics.

IBM Intelligent Data Management

At-Risk Students by Program

Student Attrition Confidence Levels

<table>
<thead>
<tr>
<th>Student ID</th>
<th>Program Name</th>
<th>Risk Groups</th>
<th>Program Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>4132768</td>
<td>Masters in History</td>
<td>High, Low, Medium</td>
<td>Associates</td>
</tr>
<tr>
<td>4096740</td>
<td>Masters in Intelligence Studies</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4074624</td>
<td>Masters in History</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4123551</td>
<td>Masters in Military Studies</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4057235</td>
<td>Masters in History</td>
<td>Medium, Low</td>
<td>Masters</td>
</tr>
<tr>
<td>4095049</td>
<td>Masters in History</td>
<td>Medium, Low</td>
<td>Masters</td>
</tr>
<tr>
<td>4030205</td>
<td>Masters in Military History</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4069931</td>
<td>Masters in Education: Teaching Reading and Literacy</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4021561</td>
<td>Masters in Education: Teaching Elementary Education</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>3080057</td>
<td>Masters in History</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4061599</td>
<td>Masters in History</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4069536</td>
<td>Masters in Education: Teaching Instructional Leadership</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4080071</td>
<td>Masters in Intelligence Studies</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
<tr>
<td>4077041</td>
<td>Masters in Intelligence Studies</td>
<td>Low, Medium</td>
<td>Masters</td>
</tr>
</tbody>
</table>
Granularity Model

Masters of Science Integrated Marketing Communications
MKT 300 Marketing Management
- Principles of Marketing
  - Understanding Marketing & The Marketing + Creating Customer Value
  - - What is Marketing
    - Market
    - Need
    - Value
    - Exchange
  - - Marketing Management
  - - Marketing Philosophy
  - - Modern Marketing
    - Strategic Planning
    - Marketing Environment
- Developing Marketing Opportunities & Strategies

Molecular Learning Object
- Concept Content Asset
- Concept Interactive Asset
- Concept Video/Audio Asset
- Concept Relevant Article
- Concept Check Quiz
- Concept Challenge Quiz
- Case Study
- Case Summary
- Questions for Discussion
- Questions for Review
- Suggestions for Further Study
- Additional Exercises
- Objective
- Class Plan
- Take-home Assignment
- In-class Case Discussion
- Role-Play Assignment
- Analysis
- etc
Community of Inquiry Survey Instrument (draft v15)
Developed by Ben Arbaugh, Marti Cleveland-Innes, Sebastian Diaz, Randy Garrison, Phil Ice, Jennifer Richardson, Peter Shea & Karen Swan

Teaching Presence

1. The instructor clearly communicated important course topics.
2. The instructor clearly communicated important course goals.
3. The instructor provided clear instructions on how to participate in course learning activities.
4. The instructor clearly communicated important due dates/time frames for learning activities.

Facilitation of Discourse

5. The instructor was helpful in identifying areas of agreement and disagreement on course topics that helped me to learn.
6. The instructor was helpful in guiding the class towards understanding course topics in a way that helped me clarify my thinking.
7. The instructor helped to keep course participants engaged and participating in productive dialogue.
8. The instructor helped keep the course participants on task in a way that helped me to learn.
9. The instructor encouraged course participants to explore new concepts in this course.
10. Instructor actions reinforced the development of a sense of community among course participants.

Direct Instruction

11. The instructor helped to focus discussion on relevant issues in a way that helped me to learn.
12. The instructor provided feedback that helped me understand my strengths and weaknesses.
13. The instructor provided feedback in a timely fashion.
Globalization

- Students have to be retrained – they know nothing about the world
- Means more than having a campus in another country
- Why aren’t there programs with multiple international components?
Common Problems

- Programs, Courses, Components, Analytics, Emerging Technology, etc, etc. all require:
The CoI Survey at APUS

• Used as the end of course survey since January 2009
• 45% return rate
• To date \( n \approx 130,000 \)
• Data analyzed using comparative descriptive statistics, regression analysis and factor analysis at the University, School, Program, Course and Instructor levels
• Recognized as Sloan-C's effective practice
Gartner Hype Cycle

- Peak of Inflated Expectations
- Plateau of Productivity
- Slope of Enlightenment
- Trough of Disillusionment
- Technology Trigger

Gartner Inc.'s Hype Cycle
Roger’s Diffusion of Innovation Adoption Curve

- 2.5% Innovators
- Early Adopters 13.5%
- Early Majority 34%
- Late Majority 34%
- Laggards 16%
When Hype Cycle Meets the Innovation Adoption Curve

- Interest/Hype vs. Number of users
- Early Adopters
- Mainstream adoption
Leveraging economies of scale

Programs, Courses, Infrastructure, Resources, Research

There will be winners and loosers – California as an example vs. for-profits
The greatest change, and the one we are the least prepared for, is that the school will have to commit itself to results.

- Peter Drucker, 1993
Thank You!

Phil Ice, Ed.D.

VP, Research and Development
American Public University System
pice@apus.edu