Building and Measuring Engagement in Online Discussions

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Overview

- Social Constructivism
- Transactivity
- Study #1 – Building engagement
- Assessment methods
- Participation marking scheme
- Study #2 – Measuring engagement
Computer-mediated Conferencing

- **CMC**: Computer-mediated Conferencing
  - Synchronous: “chat”, or instant messaging
  - Asynchronous: “discussion forum”
Learning Interactions using CMC

Learning Interactions Afforded by CMC Technology

Teacher-supplied Content

Facilitation

Facilitation

Teacher-supplied Content

Assignment

Collaboration

Student

Student

Research

Research

Research

Research

Internet Resources

Internet Resources

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The effective construction of knowledge is a product of a **functional** collaborative group.

Efficacy has been found to be linked to the **process** that learners utilize in working on the task together (Fischer et al. 2002).

John Biggs captured the educational value of discussion when he stated:

"Good dialogue elicits those activities that shape, elaborate, and deepen understanding“

(Biggs 1999 p. 5)
Transactivity: the method by which students build on the contributions of their fellow learners

(Berkowitz & Gibbs 1983)
Transactive online discussions

Transactive communication:
- Participants respond to and build on each other’s contributions
- Peer exchange of information and ideas
- Social negotiation of knowledge
- Each participant brings their own experiences to apply to a common educational goal
Transactivity

- A key theoretical construct for measuring collaboration
- How can we formulate the instructional design conditions which consistently result in more productive and transactive learning activities?
- How can we describe it in easily grasped ways?
  - Quantitative
  - Qualitative
Study #1 – 2007 – Building Engagement

- Case study of one course (Knutzen)
  - International school in Hong Kong – secondary level
  - 1-to-1 laptop blended learning environment
  - Introduction to Psychology course
  - Sample size = 24

- Investigation of instructional design conditions to achieve a highly productive online discussion

- At start of study, average student production in online discussions = 1 post
Productive Communication

Four conditions to achieve productive online discussions:

1. Teacher facilitated social formation of small groups
2. Class time to initiate oral and online discussion interaction
3. Setting open-ended, challenging topic questions that encourage discussion and debate
4. Assessment system that reinforces production and peer interaction

At end of study, average student production: over 10 posts per discussion!
Extensive use of discussion design

- Over the past four school years:
  - Extensive use of the online discussion design
  - Full-time instruction of secondary students
    - 1-to-1 laptop environment
    - IT classes
    - Psychology
  - Implemented at University of Hong Kong: 2009
  - Implemented in 12 courses at Lingnan: 2010
  - Planned for iPad project at Lingnan: 2011
- Design continues to result in good production
Designing discussion topic questions

- One to three questions around one topic or area of content / concepts
- Advantage of multiple questions:
  - Instructor can design a “gradient” of difficulty which can elicit a range of student answers
    - From basic knowledge -> higher-order thinking skills (HOTS)
    - Use a taxonomy of active verbs to specify the levels of understanding expected in answers (Blooms, SOLO)
    - Ex: from Multi-structural (*list, describe, classify*) to Relational (*compare/contrast, explain, analyze, relate*) to Extended Abstract (*hypothesize, generate, reflect*)
Objective of multiple questions:
- Make discussion accessible to all students
- Challenge the advanced students

Other topic question gradients found to be useful:
- Concrete facts -> abstract concepts
- Textbook context -> personal context (unique answers!)
Example of a Topic Question gradient:

Can you demonstrate what you have learned in your study of the Porter management models?

1. Can you **list** and **describe** the Porter models? *(Basic understanding)*

2. How can you **compare** Porter's models? *(Relational understanding)*
   Can you **relate** these models to each other in several ways, or on several dimensions?

3. Based on these models, can you **create** your own model?
   What factors do you **theorize** are important, and why? *(Extended abstract understanding)*
Discussion marking schemes

- Traditional – teacher-assessed subjective marking
  - Review contributions by each student
  - Award mark based on:
    - Participation – any contribution to discussion
    - Interaction - responding and seeking feedback
    - Transaction – sharing / exchanging useful information and resources
    - Transformation - ideas and understanding clearly develop as a function of interaction and transaction

- Best method for summative assessment
Problems with teacher assessment

- A highly productive discussion can easily produce over 200 posts!

- A teacher can become a victim of their own success
  - How much time can they devote to quantitative marking?
  - How much time remains for qualitative feedback?
Peer-assessment

- Desired graduate attributes:
  - Critical thinking skills
  - Excellent cooperative skills
    - Integrity
    - Personal responsibility

- Subjective peer-assessment can directly address the development of these attributes
  - Requires student training
  - Requires review and evaluation by teacher
Possible problems:

- Revenge grading: 報復
  - “you gave me a low grade, I will give you a low grade”

- Back-scratching: 賄賂
  - “If you give me a high grade, I will give you a high grade”
Peer-assessment – Objective?

- One solution: **objective** peer-rating based on participation

- No subjective judgment, just rating using a systematic method:

<table>
<thead>
<tr>
<th>Post #</th>
<th>Rating</th>
<th>Type of Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>Notes / Summary of content</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>Question</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
<td>Answer</td>
</tr>
<tr>
<td>4</td>
<td>10</td>
<td>Reflection</td>
</tr>
</tbody>
</table>

- Moodle can automatically **average** these grades!
Moodle averages the peer-awarded ratings

Grades produced by participation:

- One post = 6 → D-
- Two posts = 8 → B-
- Three posts = 8.6 → B
- Four posts = 9 → A-
- Five posts = 9.2 → A-
- Six posts = 9.33 → A
- Seven posts = 9.42 → A
- Eight posts = 9.5 etc

More participation = higher grade
More participation -> higher grade
Peer-rated, Participation-based

- Students cannot mark own work, only others
  - Awareness of contributions by other students
  - Team-building incentive

- Teacher has plenty of time to:
  - Monitor progress
  - Provide qualitative feedback

- Name: the “Participation Forum”
Measures of discussion activity

- **Quantitative:**
  - Production = Total number of discussion posts / $n$
  - Interactivity = Total number of feedback posts / $n$
  - Group Activity = Total number of discussion posts / # topics
  - Transactivity = Production $\times$ Interactivity

- **Qualitative:** a new type of graphical representation – the “BushGraph”
The BushGrapheR Moodle plug-in

- New Moodle plug-in automates the production of the BushGraph display of discussion activity:
  - Quantitative statistics
  - Qualitative graphic display: a “data portrait”

- Example Study #2: comparing two sections of same course
  - Section #1 did field study with service-learning component
  - Section #2 did field study without service-learning
  - How did the S-L component affect their online discussions?
Section with Service-Learning
Section with Service-Learning

- Quantitative Statistics:

**BushGraph 2.0**
Research and design by Brant Knutzen
Moodle plugin developed by Thomas Lextrait

Course: BUS-301-4 (CRN:401), Strategic Management BUS-301-4
Forum: Discussion 3- Porter's models
Ratings restricted to dates From: October 4, 2010 to October 20, 2010
Number of course participants: 27
Average number of posts per student (production) = 7.7
Average number of feedback posts per student (interactivity) = 6.6
Average number of posts per discussion topic (group activity) = 29.9
Transactivity score (production x interactivity) = 50.8
Section without Service-Learning

Quantitative Statistics:

BushGraph 2.0
Research and design by Brant Knutzen
Moodle plugin developed by Thomas Lextrait

Course: BUS-301-5 (CRN:402), Strategic Management BUS-301-5
Forum: Discussion 3: Porter's models
Ratings restricted to dates From: October 4, 2010 to October 20, 2010
Number of course participants: 22
Average number of posts per student (production) = 9
Average number of feedback posts per student (interactivity) = 8.8
Average number of posts per discussion topic (group activity) = 32.8
Transactivity score (production x interactivity) = 79.2
Results from BushGraph analysis

- Students in section doing service-learning were LESS active in online discussions

- Survey results showed that students in section doing service learning preferred face-to-face, in-class discussions

- Possible correlation between S-L activity and a preference for face-to-face discussions
Assessing Service-Learning

- I recommend a mix:
  - Participation-based discussions (formative)
  - A reflective statement about transformative learning (summative)

- Each discussion informs the next

- “Harvest” the discussions to seed the reflective statements
Assessing Service-Learning

- Example - three discussions:
  1. What did we do on our S-L experience?
  2. What is critical reflection? (see Mezirow)
  3. How did my S-L experience transform my understanding of this class?

- Each discussion should end with short reflective posts by each student

- The reflection posts seed the summative reflective statement (teacher evaluated)
Future directions for research

- Currently developing a custom Moodle block to automate the participation-based rating scheme

- The Participation Forum plug-in
  - No need to train the students
  - No need to monitor rating accuracy
  - No need to motivate student ratings of posts
  - Pilot program begins in Sep 2011
  - Available as free download in Dec 2011
Questions and Discussion

- Q & A
- Send me an email to get more info:
  - BKnutzen@LN.edu.hk
- Thanks for coming!