Pedagogies of Engagement:
Preparing Students for an Interdependent World

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Age of Interdependence

Tom Boyle of British Telecom calls this the age of interdependence; he speaks of the importance of people’s NQ, or network quotient – their capacity to form connections with one another, which, Boyle argues is now more important than IQ, the measure of individual intelligence.

Platform for Collaboration
(1st Three Flatteners):
1. 11/9/89
2. 8/9/95
3. Work Flow Software

Horizontalize

NYTimes MAGAZINE April 3, 2005
It's a Flat World, After All
By THOMAS L. FRIEDMAN

Video – Think Global Series:
http://minnesota.publicradio.org/radio/features/2005/05/collaboration/
The World is Flat

“Clearly, it is now possible for more people than ever to collaborate and compete in real-time, with more people, on more kinds of work, from more corners of the planet, and on a more equal footing, than at any previous time in the history of the world”
The great question of this new century is whether the age of interdependence is going to be good or bad for humanity. The answer depends upon whether we in the wealthy nations spread the benefits and reduce the burdens of the modern world, on whether the poor nations enact the changes necessary to make progress possible, and on whether we all can develop a level of consciousness high enough to understand our obligations and responsibilities to each other.
Collaboration

Collaboration is a purposive relationship. At the heart of collaboration is a desire or need to

• solve a problem,
• create, or
• discover something

Within a set of constraints, including expertise, time, money, competition, and conventional wisdom (p. 36)

Preparing Students for an Interdependent World

• Please reflect on how best to prepare students for an interdependent world – jot down some of your ideas

• Turn to the person next to you
  – Introduce yourself
  – Share thoughts on preparing students
Pedagogies of Engagement
Pedago-pathologies

Amnesia

Fantasia

Inertia

Lee Shulman – MSU Med School – PBL Approach (late 60s – early 70s), Currently President of the Carnegie Foundation for the Advancement of College Teaching

What do we do about these pathologies?
– Lee Shulman
Activity
Reflection
Collaboration
Passion
Combined with generative content and the creation of powerful learning communities

Formulate-Share-Listen-Create (Think-Pair-Share)

• Individually read the quote “To teach is to engage students in learning. . .”
• Underline/Highlight words and/or phrases that stand out for you
• Turn to the person next to you and talk about words and/or phrases that stood out
To teach is to engage students in learning; thus teaching consists of getting students involved in the active construction of knowledge. The aim of teaching is not only to transmit information, but also to transform students from passive recipients of other people's knowledge into active constructors of their own and others' knowledge. Teaching is fundamentally about creating the pedagogical, social, and ethical conditions under which students agree to take charge of their own learning, individually and collectively.

Foundations for Pedagogies of Engagement

1. Learning is a social activity (John Dewey)
2. Innovative learning requires ambiguity (Stuart Pugh)
3. All learning requires un-learning (John Seely Brown)
4. Learning is situated (Jean Lave)
Foundations - John Dewey

John Dewey’s ideal school:

• a “thinking” curriculum aimed at deep understanding
• cooperative learning within communities of learners
• interdisciplinary and multidisciplinary curricula
• projects, portfolios, and other “alternative assessments” that challenged students to integrate ideas and demonstrate their capabilities.

Cooperative Learning

Kurt Lewin - Social Interdependence Theory (~1935)

1. The essence of a group is the interdependence among members (created by common goals) which results in the group being a "dynamic whole" so that a change in the state of any member of subgroup changes the state of any other member or subgroup.

2. An intrinsic state of tension within group members motivates movement toward the accomplishment of the desired common goals.
Student – Student Interaction

Lewin’s Contributions

• Founded field of social psychology
• Action Research
• Force-Field analysis
• \( B = f(P,E) \)
• Social Interdependence Theory
• “There is nothing so practical as a good theory”
Cooperative Learning

- Research – Randomized Design Field Experiments
- Practice – Formal Teams/Professor’s Role
Cooperative Learning

• Positive Interdependence
• Individual and Group Accountability
• Face-to-Face Promotive Interaction
• Teamwork Skills
• Group Processing
Cooperative Learning: Key Concepts

- Positive Interdependence
- Individual and Group Accountability
- Face-to-Face Promotive Interaction
- Teamwork Skills
- Group Processing

Cooperative Learning

Positive Interdependence

- Task Interdependence
  - Factory line
  - Chain reaction
- Identity Interdependence
  - Mutual identity (name, motto, etc.)
- Resource Interdependence
  - Limit resources (one set of materials)
  - Jigsaw materials
  - Separate contributions
- Environmental Interdependence
  - Designated classroom space
  - Group has special meeting place
- Duty (Role) Interdependence
  - Assign each member a role and rotate them
- Fantasy Interdependence
  - Hypothetical interdependence in situation
    (“You are a scientific literature prize team, lost on
    the moon, etc.”)
- Reward/Celebration Interdependence
  - Credit for group success
  - Bonus points
  - Nonacademic rewards
    (food, free time, etc.)
  - Single group grade (when fair to all)
- Outside Challenge Interdependence
  - Intergroup competition
  - Other class competition

Individual Accountability

Ways to ensure no slackers:
- Keep group size small
- Assign roles
- Randomly ask one member of the group to explain the learning
- Have students do work before group meets
- Have students use their group learning to do an individual task afterward
- Everyone signs: “I participated, I agree, and I can explain the information”
- Observe & record individual contributions

Ways to ensure that all members learn:
- Practice tests
- Exit each others work and sign agreement
- Randomly check one paper from each group
- Give individual tests
- Assign the role of checker who has each group member explain their load
- Simultaneously explaining, each student explains their learning to a new partner

Face-to-Face Interaction

Structure:
- Time for groups to meet
- Group members close together
- Small group size of two or three
- Frequent oral rehearsal
- Strong positive interdependence
- Commitment to each other’s learning
- Positive social skill use
- Celebrations for encouragement, effort, help, and success

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Cooperative Learning Research Support

- Over 300 Experimental Studies
- First study conducted in 1924
- High Generalizability
- Multiple Outcomes

Outcomes

1. Achievement and retention
2. Critical thinking and higher-level reasoning
3. Differentiated views of others
4. Accurate understanding of others' perspectives
5. Liking for classmates and teacher
6. Liking for subject areas
7. Teamwork skills
Small-Group Learning: Meta-analysis


Small-group (predominantly cooperative) learning in postsecondary science, mathematics, engineering, and technology (SMET). 383 reports from 1980 or later, 39 of which met the rigorous inclusion criteria for meta-analysis.

The main effect of small-group learning on achievement, persistence, and attitudes among undergraduates in SMET was significant and positive. Mean effect sizes for achievement, persistence, and attitudes were 0.51, 0.46, and 0.55, respectively.
Strategies for Energizing Large Classes: From Small Groups to Learning Communities:

Jean MacGregor, James Cooper, Karl Smith, Pamela Robinson

New Directions for Teaching and Learning, No. 81, 2000.
Jossey- Bass
Pedagogies of Engagement: Classroom-Based Practices

http://www.asee.org/about/publications/jee/upload/2005jee_sample.htm
Throughout the whole enterprise, the core issue, in my view, is the mode of teaching and learning that is practiced. Learning ‘about’ things does not enable students to acquire the abilities and understanding they will need for the twenty-first century. We need new pedagogies of engagement that will turn out the kinds of resourceful, engaged workers and citizens that America now requires.”

Russ Edgerton (reflecting on higher education projects funded by the Pew Memorial Trust)
Shaping the Future: New Expectations for Undergraduate Education in Science, Mathematics, Engineering and Technology – National Science Foundation, 1996

Goal – All students have access to supportive, excellent undergraduate education in science, mathematics, engineering, and technology, and all students learn these subjects by direct experience with the methods and processes of inquiry.

Recommend that SME&T faculty: Believe and affirm that every student can learn, and model good practices that increase learning; starting with the student’s experience, but have high expectations within a supportive climate; and build inquiry, a sense of wonder and the excitement of discovery, plus communication and teamwork, critical thinking, and life-long learning skills into learning experiences.
Active Learning: Cooperation in the College Classroom

- **Informal**
  Cooperative Learning Groups
- **Formal** Cooperative Learning Groups
- Cooperative **Base** Groups

See Cooperative Learning Handout (CL College-804.doc)
Book Ends on a Class Session
Book Ends on a Class Session

1. Advance Organizer
2. Formulate-Share-Listen-Create (Turn-to-your-neighbor) -- repeated every 10-12 minutes
3. Session Summary (Minute Paper)
   1. What was the most useful or meaningful thing you learned during this session?
   2. What question(s) remain uppermost in your mind as we end this session?
   3. What was the “muddiest” point in this session?
The “Hake” Plot of FCI

![Graph showing the "Hake" Plot of FCI with data points and trend lines for different groups such as ALS, SDI, UMn-CL+PS, UMn Cooperative Groups, UMn Traditional, ASU(nc), ASU(c), WP, WP*, and PI(HU).]
Maya Lin Boundaries

I feel I exist on the boundaries

Maybe I’m just asking you to pay closer attention to the land.
Mitakuye Oyasin

"We are all related"

Education is an art of process, participation and making connection.

Albert White Hat, Sr. & Cheryl Medearis
Sinte Gleska University, Rosebud, South Dakota
Formulate-Share-Listen-Create (Think-Pair-Share)

• Please reflect on the session
• List things that are memorable
  – Useful, valuable, provocative, etc.
• List questions that you have and comments you’d like to make
• Turn to the person next to you and compare notes