CONNECTING THE DOTS: COLLABORATIVE LEARNING INSIDE AND OUTSIDE CLASSROOM

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Bridging…

“The idea of a division between social and cognitive processing in the brain is really pretty artificial. The two deeply interact with each other.”

Steven Quartz, a professor of philosophy in the Social Cognitive Neuroscience Laboratory of Caltech.
New? Groupthink

Wordle of 240+ online comments to The Rise of the New Groupthink
By SUSAN CAIN Published: January 13, 2012 by NY Times
The trend
Why groups?

- Students who have difficulty talking in class may speak in a small group.
- More students, overall, have a chance to participate in class.
- Talking in groups can help overcome the anonymity and passivity of a large class or a class meeting in a poorly designed room.
- Students who expect to participate actively prepare better for class.
- Students become more capable of understanding the problem by engaging in discussions about the problem.
Why NOT

- Waste of time
- Free loaders
- Outsiders
- Introverts
- Difficulty meeting outside of classroom (large projects)
- Impedes creativity (?)
Several studies demonstrated that small group learning can significantly improve mathematical problem solving and procedural abilities of students enrolled in remedial mathematics courses.

Attitude (Pre)Survey (another one)

When learning new material in the classroom, I would rather work
alone
with a partner
in a group
does not matter

When reviewing and practicing in the classroom, I would rather work
alone
with a partner
in a group
does not matter

During a quiz, I would rather work
alone
with a partner
in a group
does not matter

On a take home project, I would rather work
alone
with a partner
in a group
does not matter
## Mat096 (Basics Skills Algebra)

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<th>Project (out of class)</th>
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Magic Bullet

- Discovery (groups of 2-4)
- Practice/Review (pairs)
- Projects (pairs)
- Quiz (solo and pairs)

- Partners are matched
- Pairs are fixed unless dysfunctional
Two to tango

- Shared responsibility
- No free riding
- Best chance to listen and to be heard
- Simple dynamics
- Most suitable for all personality types and learning preferences
Back to USSR
Hybrid Course

The time spent in the classroom is reduced (typically halved)

Significant portion of the learning activities takes place online, often asynchronously
Upside

- Flexibility: suits different schedules and learning styles
- Encourages integration of out-of-class activities with in-class activities for more effective use of in-class time
- Promotes self-directed learning
- Enhances computer skills
- Promotes greater student involvement and engagement
Downside

- Limited opportunity for F2F interactions
- Disconnect between in-class activities and out-of-class activities
- Undermined by inadequate study skills: poor time management and weak self-motivation
- Jeopardized by insufficient computer skills
- Students feel alone and overwhelmed
- Lack of student involvement and engagement
A study was conducted to investigate the nature and quality of online mathematical communication that occurred during collaborative problem solving and its effect on mathematical achievement in college algebra. After controlling for initial differences in mathematical ability, the treatment group performed significantly better than the control group on the final examination.
Online Platforms

- ePortfolio
- Wiki
- Blogsite
- Piazza
Lab One: Question Four

4) If 1/2 is subtracted from 3 times a number the reciprocal of a number y, the result is 1. What is the equation that determines the correct value of y?

The students' answer, where students collectively construct a single answer

I think it might be 3y - 1/2 = 1

The instructors' answer, where instructors collectively construct a single answer

Click to start off the wiki answer

Follow-up discussions for lingering questions and comments

- dalia rosas (anon. to classmates) 1 month ago
- OR maybe 3 * 1/y - 1/2 = 1
Piazza Features:

- **Real-Time Q&A**
  - No need to refresh the browser, everything happens right before your eyes – designed to model face-to-face interactions

- **Post Notes**
  - Keep everyone in the loop with class announcements

- **Post Questions**
  - Spark discussions or let students take the lead

- **Post Polls**
  - Get quick results, answers, and/or feedback

- **Intuitive Answer Format**
  - Collaboration is proven to enhance learning – inspiring Piazza’s wiki-style, single answer sections for instructors and students

- **Follow-up Discussions**
  - There’s always room to be confused – foster new discussions and debates easily organized around class topics

- **Participation Statistics**
  - Sortable and exportable – everything you’d ever want to know about your class and students

- **Groups-based Learning**
  - Organize sections, project teams, study groups, and more

- **Multimedia Embedding**
  - Add images, files, videos, and more right into your discussion

- **Endorsements**
  - Don’t waste time replicating quality content – endorse student questions and answers

- **Anonymity**
  - Students can post, edit, and answer with their name hidden from peers – encourages more active participation from everyone

- **Advanced Notifications**
  - Choose the settings you want to always stay in the know

- **Mobile Apps**
  - iPhone, iPad, and Android – free and replicas of the web version

- **FREE! Now and forever for academic use.**
Research Questions

1. What is the nature and quality of the online mathematical communication that occurs in collaborative groups in a college statistics course?

2. Is there a relationship between mathematical achievement in college statistics as measured by a problem solving examination and the quality of online mathematical communication?

2. Is there a difference in quality of online mathematical communication and its effect on achievement between standard and hybrid model?
Reality Check

- Pre and post attitude surveys
- Analyses of quality of online communication
- Comparison of learning outcomes (retention, pass rate, grade distribution, quality of WA)
“Through communication, (mathematical) ideas become objects of reflection, refinement, discussion, and amendment. The communication process also helps build meaning and the permanence for ideas and makes them public”

NCTM’s Principles and Standards for School Mathematics, p.60 (2000)
References


Acknowledgements

- LaGuardia Community College
- Mathematics, Engineering, and Computer Science Department
- LaGuardia Center for Teaching and Learning
Thank You!

Questions?