Automating Qualitative Assessment (from studio critique to art appreciation)

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large number of independent elements/agents
dynamic interactions between agents

- · local interactions / unaware of global behavior
- randomness / diversity

modeling emergence

murmuration

• Can learning be an emergent behavior?

system features that can lead to "complex outcomes"

- a large number of independent agents
- · heterogeneity (diversity, more is different)
- adaption (change based on desires and outcomes)
- local interactions
- feedback (negative and positive)
- external influences (randomness)

I teach a large class (250+ students)

- reading assignment before each lecture
- PowerPoint lectures each class
- all recorded in Tegrity
- online quiz after every class (quantitative)
- in-class essay during every class (qualitative)

Short essay (5 min.)

Put your name and your class id# in the *upper right corner* of your card. Please use the format: Firstname Lastname id#



When does "craft" become "art" ?

the question I asked myself

- do we really need to meet?
- No...if we can somehow "automate" qualitative assessment
- computer-based peer assessment makes that possible



computer-based peer assessment

- qualitative assessment can be automated
- studies show it can be *more effective* than faculty assessment
- now all aspects of a course can run automatically
- · asynchronous and tightly scheduled
- once the experience is designed, learning can occur without any "teaching" by faculty

Elements of the online learning environment include:

- a faculty designed curriculum —readings —recorded lectures (media rich) —pertinent links, other content
- a student cohort moves as a group through course materials on a regular assignment schedule, handled by the LMS

Elements of the online learning environment include:

- · regular quizzes (quantitative) graded by LMS
- · written assignments (qualitative) using online peer review
- · peer-assessments are randomly and anonymously assigned
- peer-assessments are also graded (meta-assessments)
- finished assignments are posted, ranked and sorted based on the peer-reviews (collaborative filtering)

Patterns and observations from successful computer-based peer assessment include:

- students learn from being graded by their peers and from grading their peers
- · peer-review is more effective if done anonymously
- meta-assessments (grading the grading) improves overall quality
- aggregating multiple reviews per project is better than a single assessment (6 seems to be the magic number)
- posting assessed work provides useful models of quality for the next assignment (adaption)



Imagine an "Intro to Music" course

• taught by Wynton Marsalis

- a lecture/documentary series with high production values (\$500,000+)
- all materials are online or on your phone (media rich)
- 5000+ students enrolled as a cohort (a large number of students is a feature, ensuring diversity in the system!)

- a 10x increase in student size, negligible increase in cost
- · for-profit universities (capitalism is going to drive this!)
- · venture capitalists are already investing













Moodle 2.0 Workshop module

- open source computer-based peer assessment
- · anonymous and aggregated
- faculty defined allocations and rubrics
- grading is graded via algorithms

<u>artMoodle</u>

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some observations

- students engage the process easily
- · aggregated assessments do work
- trust the system!
- give students example grading to review



possible variations

- grade across classes
- grade across institutions
- outsource the grading (Mechanical Turk)
- mix and match



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