April 12, 2013:
GradeCraft: Exploring Online Use Data to Uncover Student Engagement

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GradeCraft: Metrics for Motivation

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Mika LaVaque-Mantz
Seminar on Learning Analytics at Michigan
April 12, 2013
Acknowledgements

Stephen Aguilar
Caitlin Holman
Ben Peterson
Why Play? The Four Freedoms

- Freedom to Experiment
- Freedom to Fail
- Freedom of Perspective
- Freedom of Effort

- Scot Osterweil, MIT and Learning Games Network
Games Create a "Magic Circle"

- We are willing to accept arbitrary rules *because* they exist with a game space
  - Example: Golf
- The classroom is also a "game space," but it is a poorly designed one
  - Students understand "the rules," and they accept the bargain of playing the game in order to get the grade
  - Many students (especially at UM) have become so good at the game that they are uncomfortable with other approaches
- But we really need a better game to play...
Underpinnings of an Improved Grading Game

From Motivation:
- Emphasize mastery over performance (Goal Theory)
- Support autonomy, belonging, and competence (Self-Determination Theory)

From Game Design:
- Multiple routes to success
- Productive failure & risk taking
- Level up (vs. losing ground)
A Tale of Two Assessment Systems

Traditional
- Lack of control
- Instructor chooses focus
  (one size fits all)
- Learners receive grades
- Disincentive to stretch
- High-stakes evaluation
- Incentivize avoidance

Playful
- Self-determination
- Student chooses focus
  (different strokes)
- Learners earn "grades"
- Encourage risk-taking
- Lowered cost of failure
- Incentivize progression
More than just "gamification"

(A video example with leader boards - sorry, we can't make the video available)
"Gamification is bullshit."
- Ian Bogost, GA Tech

A tool used to:
- impress
- conceal
- coerce

Source: Gizmodo.com
Instead of "Gamified..." try "Gameful" or "Game-Inspired"
Your current score is 11,500

Points so far

Available Points

Total Points

Available Points

- Badges
- Solo Project
- Group Project
- Conventional Essays
- Blogging
- Section
- Readings
- Lecture

Lecture
900 / 1,400 possible points

Readings
2,700 / 4,200 possible points

Section
2,700 / 4,200 possible points

Blogging
1,200 / 3,000 possible points

Group Project
4,000 / 4,000 possible points

Solo Project

Note: This is not a real student!
Your current score is **15,600**

**Available Points**
- Badges
- Solo Project
- Group Project
- Conventional Essays
- Blogging
- Section
- Readings
- Lecture

**Total Points**
- 0k
- 2.5k
- 5k
- 7.5k
- 10k
- 12.5k
- 15k
- 17.5k
- 20k
- 22.5k
- 25k

**Available Points**
- Badges
- Solo Project
- Group Project
- Conventional Essays
- Blogging
- Section
- Readings
- Lecture

**Class Standings**
- Readings: **2,700 / 4,200 possible points**
- Section: **3,000 / 4,200 possible points**
- Blogging: **1,200 / 3,000 possible points**
- Group Project: **4,000 / 4,000 possible points**
- Solo Project: **0 / 4,000 possible points**

Badges you’ve earned will shine brightly!
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Note: None of these students are real!
Research Approach

Design-Based Research
- Start with the theory (small "t")
- Design intervention to test theory
- Evaluate with appropriate methods
- Revise theory/intervention and iterate, iterate, iterate

Design-Based Implementation Research
- A focus on persistent problems of practice from multiple stakeholders' perspectives
- A commitment to iterative, collaborative design
- A concern with developing theory and knowledge related to both teaching/learning and implementation
- A concern with developing capacity to support change in systems
Big Data vs. Big Enough Data

"When you say 'big data,' you really just mean 'data''
- Bogost (again; maybe)

- We are taking a course-centric approach... with big data leanings
- A bottom-up approach to designing the analytics, seeking what is most useful for both instructors and for students
- Trying to create something useful and scalable (recognizing that the pedagogy is the hard part)
LA Objectives of GradeCraft

- Use data to create a "virtuous feedback loop" for both learners and instructors
- "Student-facing" analytics that:
  - enhance students' feelings of autonomy
  - enhance students' feelings of belonging
  - enhance students' feelings of competence
  - direct students towards desired learning behaviors
- "Instructor-facing" analytics that:
  - enable monitoring of individual and group progress
  - focus attention where it is needed
  - make it easier to manage the course
Badges Serve Multiple Ends

- As Assessments (Formative & Summative)
  - Rapid feedback on progress towards goals
  - Overview of accomplishments
- As Instructional Tools
  - Better info. about prerequisite knowledge
  - Establish expectations about learning progressions
- As Instruments for Personal Growth
  - Provide multiple pathways to goals
  - Support self re/presentation of achievement
- As Signals
  - "Nerd cred" (akin to "letter" jackets)
  - Help teams/groups self-organize
  - Improvement over "thin" grades and transcripts
Findings from Fall 2012 PoliSci 101

- Dependent Variable: Grade in Course

- Independent Variables
  - Frequency of checking Predictor
  - Timing of checking Predictor (in class/out of class; time of month)
  - Survey responses (motivation variables)
  - Declared major (poli-sci non/poli-sci/undeclared)

- But first… an overview of the PoliSci 101 grading system
COMMON COMPONENTS
- Readings
- Lecture
- Discussion

OPTIONAL COMPONENTS
- Essays
- Blogging
- Group project
- New media project

BADGES
- "Experience points"
- Small variance in possible points
- Students select two
- Students allocate weights
- Scored for quality: high variance
- "Positive externalities" for going above and beyond
- Rewards good "studenting"
More Context for the Course

- 15 sections of 20; 5 GSIs
  - Students with A's = 210/299
  - Students with B's = 81/299
  - Student's Below a B = 8/299
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What's Next?

- Research on what instructors and learners want
- Research on which behaviors produce useful insights for instructors and learners
- Research on how instructors and learners make use of process/progress data
- We need better grading tools - GradeCraft is only useful with current, frequent updates
- We need common real-time analytics tool kits that are FERPA-compliant and can be plugged into GradeCraft and others
Thank You