



STUDENT LEARNING AND ANALYTICS AT MICHIGAN

April 12, 2013:

GradeCraft: Exploring Online Use Data to Uncover Student Engagement

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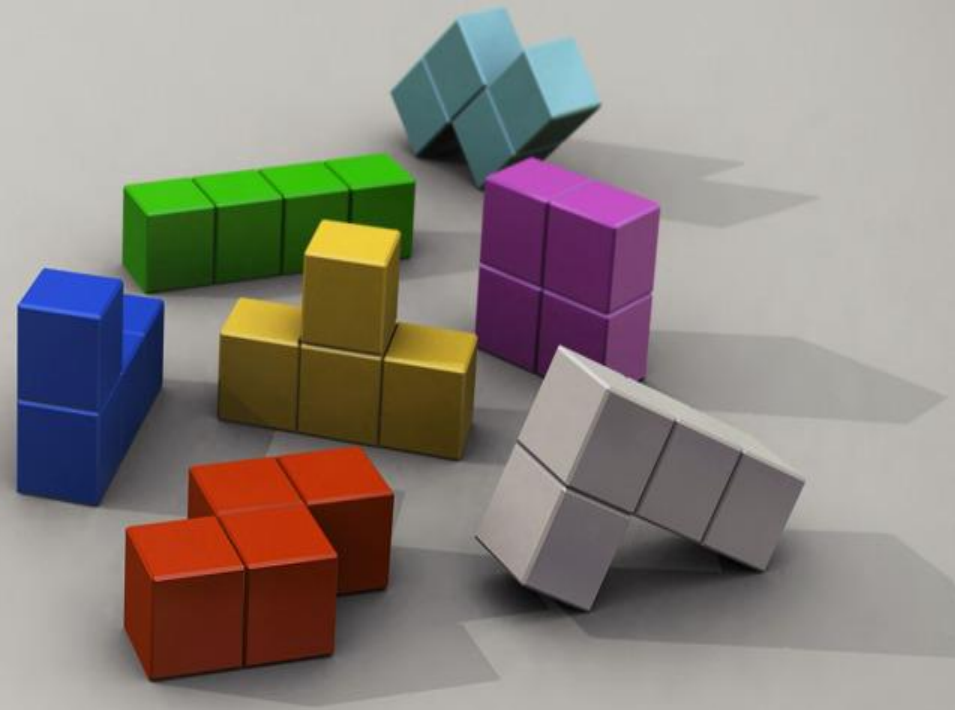


STUDENT LEARNING AND ANALYTICS AT MICHIGAN

www.crlt.umich.edu/slam

GradeCraft: Metrics for Motivation

Barry Fishman
Mika LaVaque-Manty
Seminar on Learning
Analytics at Michigan
April 12, 2013



Acknowledgements

Stephen Aguilar

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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



**Instead of "Gamified..." try
"Gameful" or "Game-
Inspired"**

GradeCraft

Badges



Badges you've earned will shine brightly!

Predict Course Grade

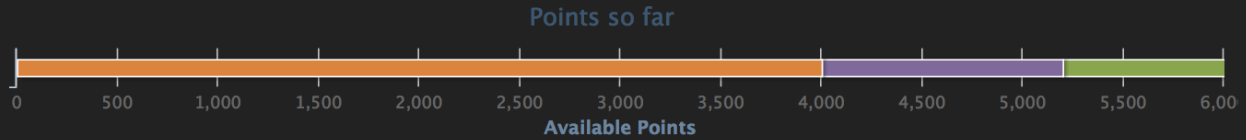
Check My Final Grade

To Do List ▾

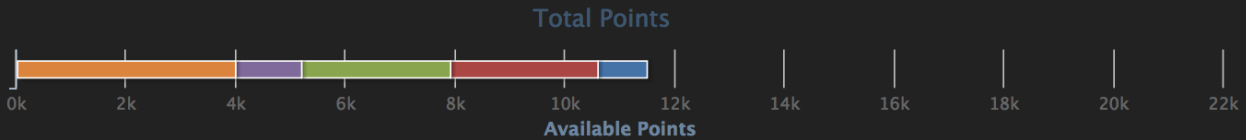
Learning Objectives

Scoreboard Badges

Your current score is **11,500**



Badges Solo Project Group Project Conventional Essays Blogging Section Readings Lecture



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!

Badges



Badges you've earned will shine brightly!

[Predict My Grade](#)

[Check My Final Grade](#)

[Class Standings](#)

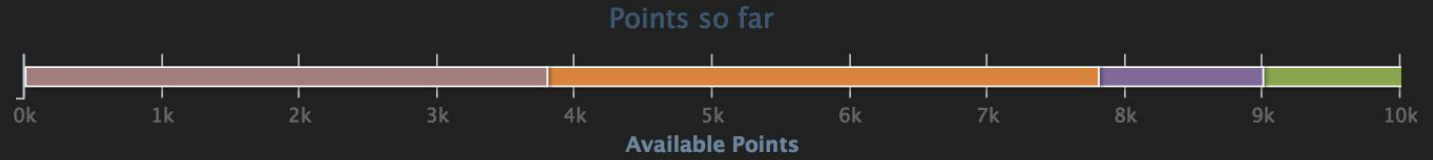
[Learning Objectives](#)

[To Do List](#)

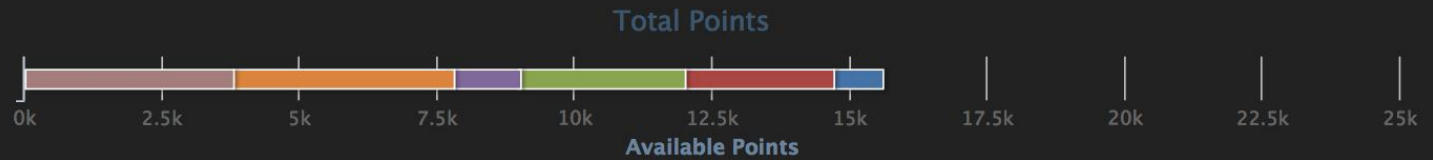
Scoreboard

Badges

Your current score is **15,600**



Badges Solo Project Group Project Conventional Essays Blogging Section Readings Lecture



Badges Solo Project Group Project Conventional Essays Blogging Section Readings Lecture

Class Standings



Readings

900 / 1,400 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

RANK	NAME	EMAIL	ATTEND	LOG INS	PAGE VIEWS	PREDICTOR VIEWS	BADGES EARNED	SCORE	LAST PREDICTED GRADE	CURRENT GRADE
1	 Andrew Garcia	andrew.garcia@umich.edu		12	20	3		49385	A	A
2	 Thomas Jenkins	thomas.jenkins@umich.edu		9	20	0		45300	A+	A
3	 Stephanie White	stephanie.white@umich.edu		32	52	14		40750	A	A-
4	 Sylvia Whitty	sylvia.whitty@umich.edu		11	21	2		40480	A+	A-
5	 Jack Cissell	jack.cissell@umich.edu		19	34	3		38030	B+	A-
6	 David Bell	david.bell@umich.edu		15	23	3		38020	A	A-
7	 Ida Pharr	ida.pharr@umich.edu		85	115	2		37690	A-	B+
8	 Barbara Butler	barbara.butler@umich.edu		56	155	4				

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

- "Experience points"
- Small variance in possible points

OPTIONAL COMPONENTS

Essays

Blogging

Group project

New media project

- Students select two
- Students allocate weights
- Scored for quality: high variance

BADGES

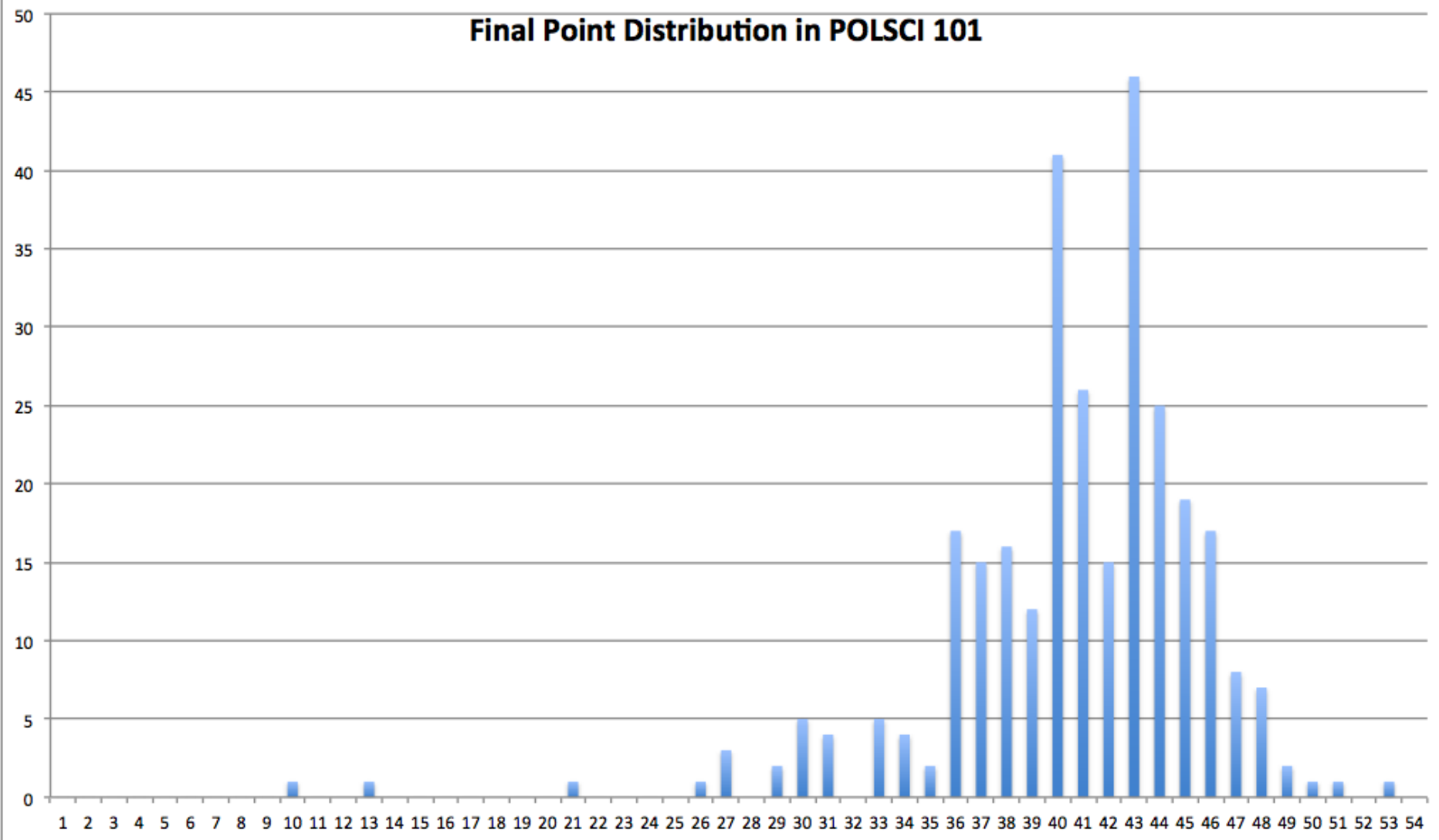


- "Positive externalities" for going above and beyond
- Rewards good "studenting"

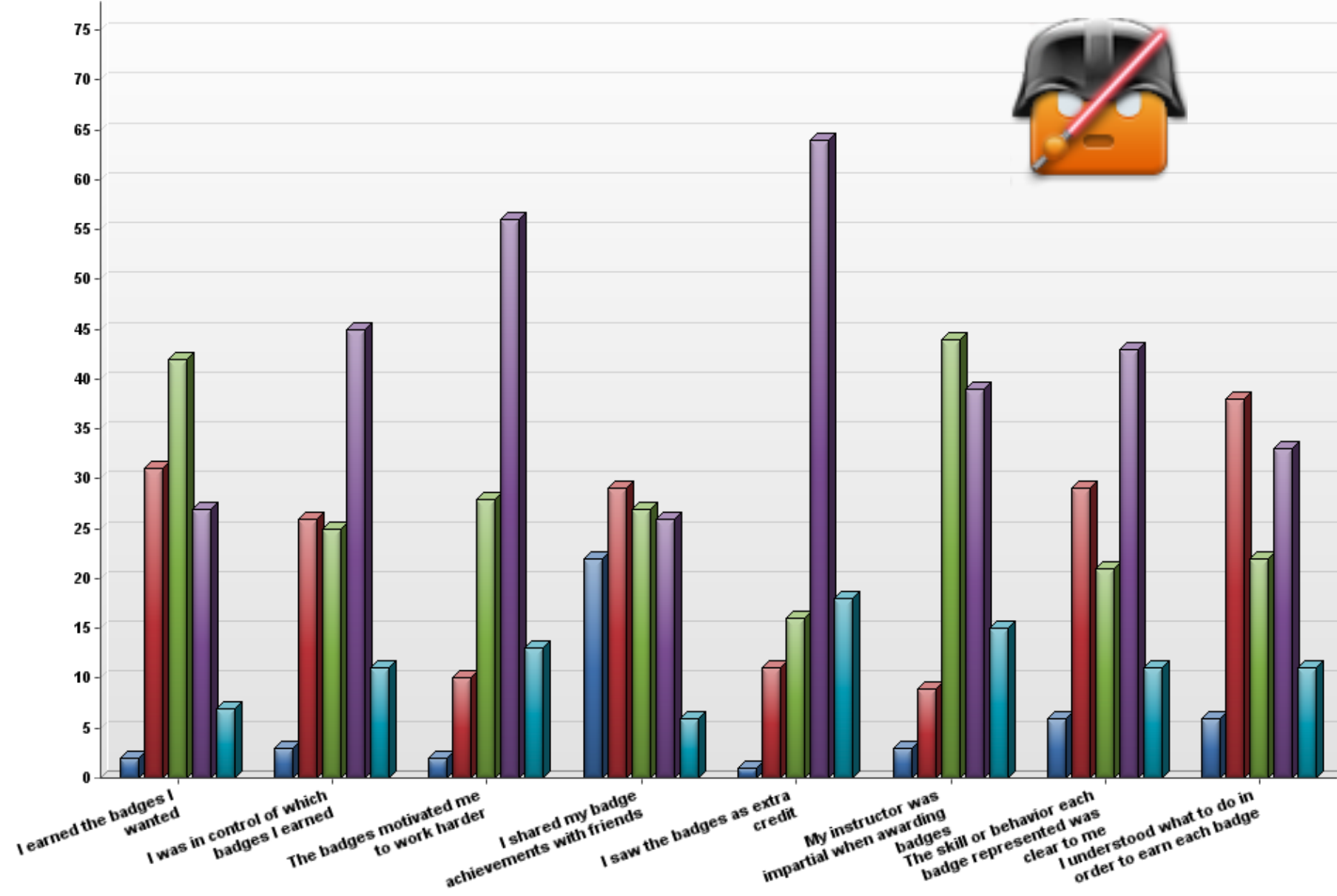
More Context for the Course

- 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

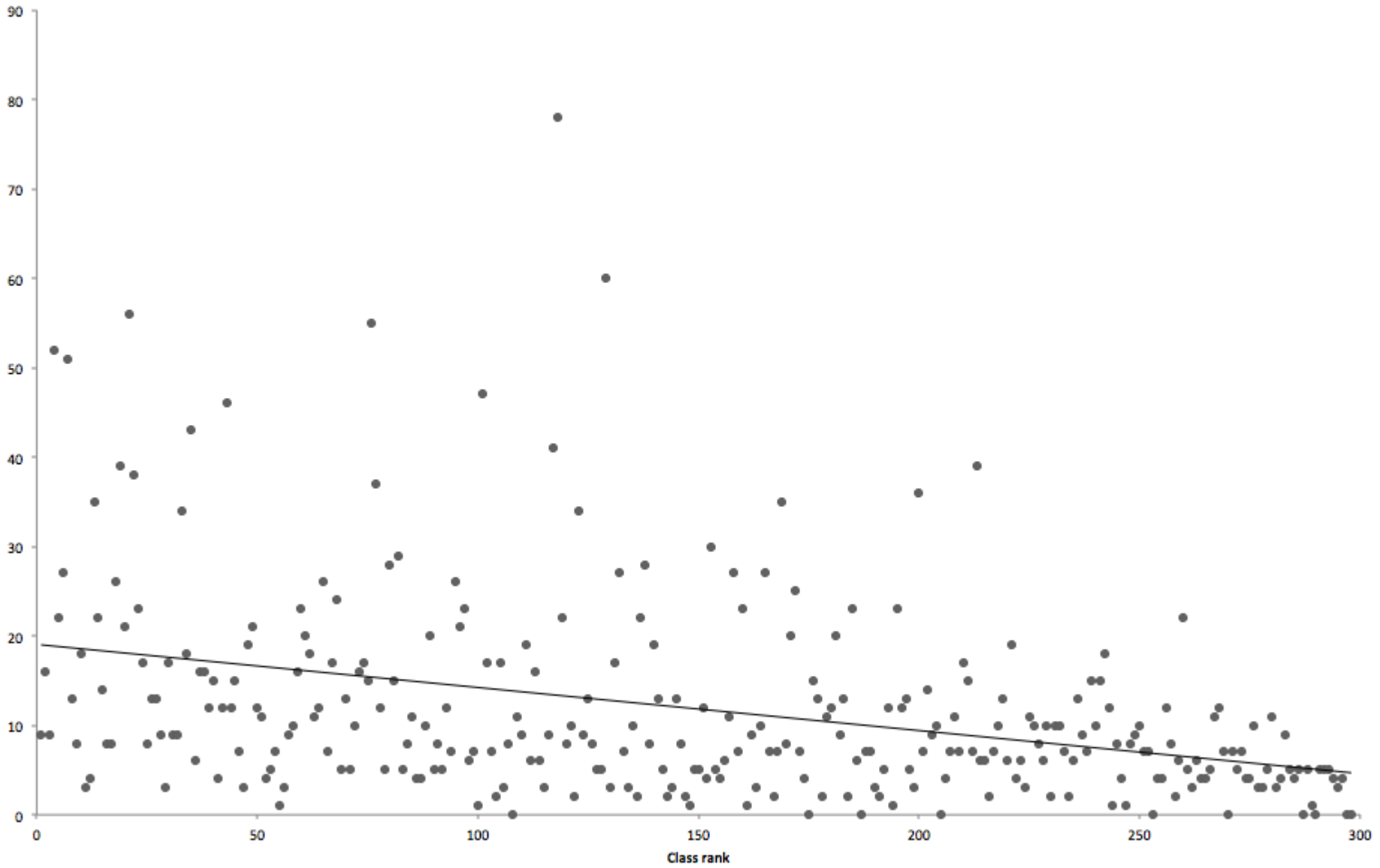
Final Point Distribution in POLSCI 101



Strongly Disagree Disagree Neither Agree nor Disagree Agree Strongly Agree

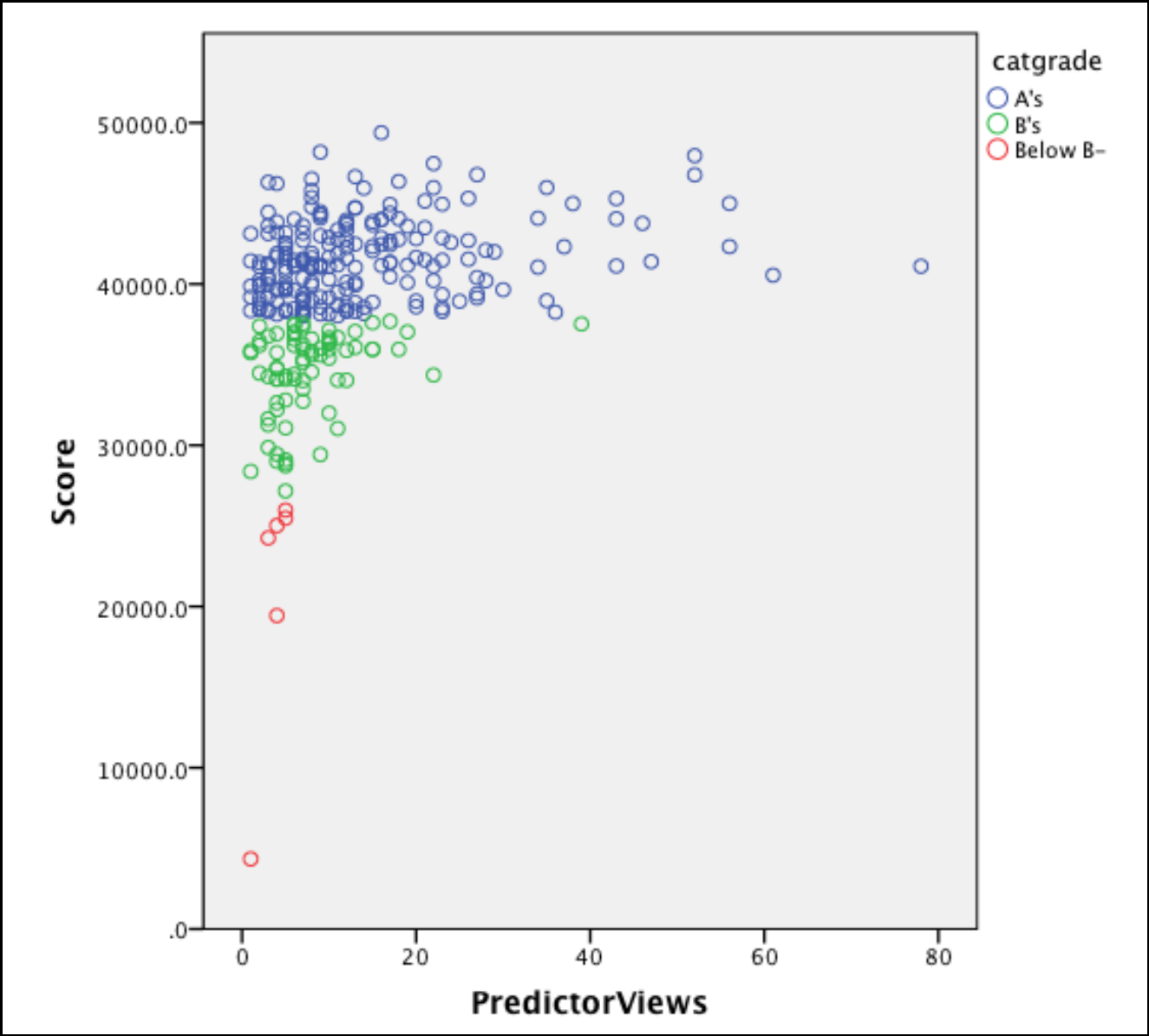


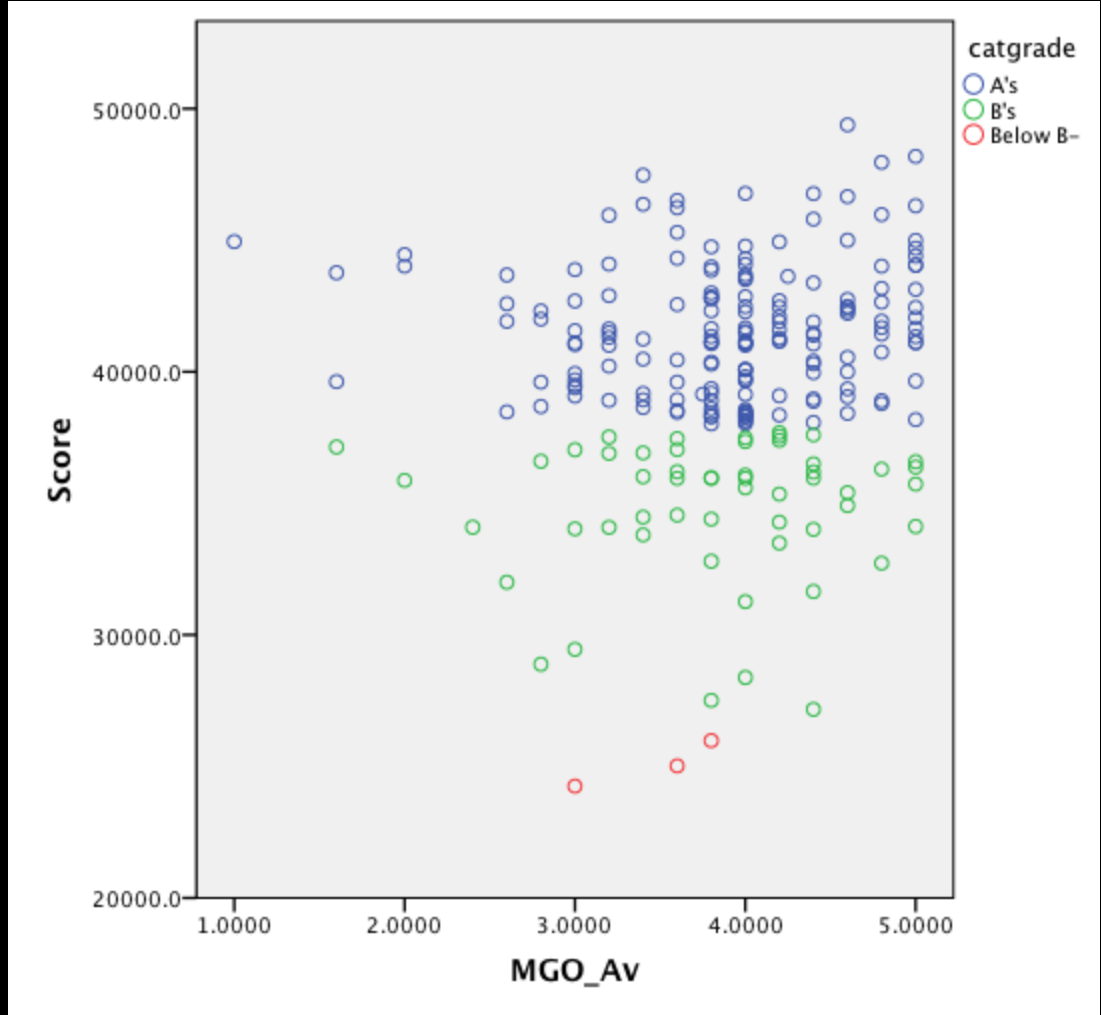
Predictor views by class rank



Correlations

		Score	Logins	PageViews	PredictorViews
Score	Pearson Correlation	1	.327	.460	.338
	Sig. (2-tailed)		.000	.000	.000
	N	299	299	299	289
Logins	Pearson Correlation	.327	1	.552	.276
	Sig. (2-tailed)	.000		.000	.000
	N	299	299	299	289
PageViews	Pearson Correlation	.460	.552	1	.536
	Sig. (2-tailed)	.000	.000		.000
	N	299	299	299	289
PredictorViews	Pearson Correlation	.338	.276	.536	1
	Sig. (2-tailed)	.000	.000	.000	
	N	289	289	289	289





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