Using Badges for Test Prep in a Gamified Class about Games

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Overview

1. About the course
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4. Results
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COMM190: Gaming and Interactive Media

- Intro and overview of digital game industries
- Topics include:
  - History of games
  - State of the industry
  - Careers in the industry
  - Legal issues
  - Negative social impact
  - Positive social impact

COMM190: Gamification

- Students are placed in 'guilds' to collaborate on projects throughout the semester
- Assessment borrows terms from gaming:
  - Experience points (XP): points for grades
  - Crafting: in-class work and homework
  - Questing: research projects
  - Bosses: quizzes and tests
  - Bonus point: extra credit
- Course initially designed and gamified by Dr. Richard Taylor

The Research Project

- Carried out by College of Comm.'s Gaming Group
- Connected to COMM190 final exam
- Badges were awarded for studying behaviors
- Designed as control/treatment experiment
  - Treatment group was allowed access to PSU badge system
  - Control group was not
  - All students were allowed access to test prep materials
- Overarching rationale: Providing badges for studying should motivate students to study more and improve their grades on final exam
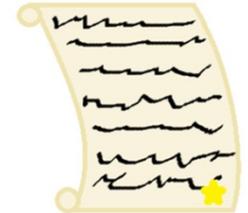
The Research Project: Study Materials

- Posted to ANGEL

- Included:
  - Review session during class period
  - Assignment during review session
  - Practice quizzes (one for each topic)
  - Option to create multiple choice test questions (one for each topic)
  - Discussion forum to post and answer questions for each other

The Research Project: Badges

- Created and administered via EGC's badge system
- Badges were awarded for:
  - Attending review session
  - Signing up for badge system
  - Completing study materials
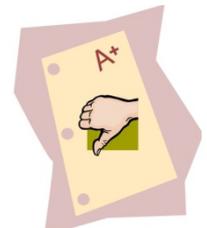 - Completing sets of study materials (e.g., all practice quizzes)

The Research Project: Variables

- Study materials (20 possible)
  - Completed any?: Yes = 80, No = 21
  - $M = 8.44$, $SD = 5.10$
  - Max. = 20, Min. = 0, Median = 11
- Badges (26 possible)
  - All participants ($N = 101$)
    - Completed any?: Yes = 16, No = 85
    - $M = 1.89$, $SD = 5.17$
  - Treatment ($N = 54$)
    - Completed any?: Yes = 16, No = 38
    - $M = 3.54$, $SD = 6.67$
    - Max. = 24, Min. = 0, Median = 0

The Research Project: Variables

- Motivation: measured on 7-point scale on final exam
  - Intrinsic motivation: personal motivation to learn
    - 4 items: $\alpha = .74$, $M = 4.75$, $SD = 1.01$
    - Ex.: "The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible."
  - Extrinsic motivation: motivated by external sources
    - 4 items: $\alpha = .75$, $M = 5.30$, $SD = 1.26$
    - Ex.: "I want to do well in this class because it is important to show my ability to my family, friends, employer, or others."
- Midterm grade: $M = 85.60$, $SD = 7.66$
- Final exam grade: $M = 80.24$, $SD = 9.18$

Results: Study Materials

H1: Treatment condition should study more

H2: People who engage with badge system should study more

H3: People who are motivated should study more

Results: Study materials

- All tested with linear regression

Variable	β	t	p
Condition[a]	-0.09	-0.80	.425
Collected badges[b]	0.36	3.31**	.001
Int. motivation	-0.08	-0.84	.406
Ext. motivation	0.05	0.48	.630

Note: [a]1 = Treatment; [b]1 = Yes; R^2 = 0.12; * $p < .01$; ** $p < .05$; *** $p < .001$

Results: Badges

H4: People who are motivated should collect more badges

- Total number of badges completed tested with linear regression

- All participants: Neither intrinsic (β = -0.09, p = .407) nor extrinsic (β = 0.02, p = .834) motivation predicted badges collected

- Treatment: Neither intrinsic (β = -0.11, p = .448) nor extrinsic (β = 0.01, p = .948) motivation predicted badges collected

Results: Final exam scores

H5: Treatment condition should score higher on the final exam

H6: People who collect badges should score higher on the final exam

H7: People who study more should score higher on the final exam

H8: Intrinsic motivation should be positively correlated with final exam score

H9: Extrinsic motivation should not correlate with final exam score

Results: Final exam scores

- All tested with linear regression

Variable	β	t	p
Condition	0.07	0.66	.512
Total badges	-0.14	-1.18	.240
Total study materials	0.14	1.33	.188
Int. motivation	-0.20	-1.98*	.051
Ext. motivation	-0.23	-2.33**	.022

Note: [a]1 = Treatment; R^2 = 0.11; * $p < .01$; ** $p < .05$; *** $p < .001$

Discussion: Collecting badges

- Students will not necessarily collect optional badges
  - 16 of 54 in treatment condition collected badges (29.6%)
- Those who do collect badges are likely to collect many badges
  - 10 of 16 collected 13 or more badges (out of 26 possible)
- Intrinsic and extrinsic motivations to learn did not predict badge collection
  - Measurement may have been problematic (more later)
  - What did motivate those who collected badges?
    - Completionism? Gaming habits? Something else?

Discussion: Study habits

- People who engaged in the badge system completed more study materials
  - Cannot establish causality – engagement was self-selected
    - Treatment condition did not increase use of study materials
    - Possible third variables?
      - Evidently not motivation
      - Completionism?
- Intrinsic and extrinsic motivations to learn did not predict study habits
  - Measurement may have been problematic (more later)
  - Again, what did motivate study habits?

Discussion: Final exam scores

- Treatment and number of badges did not improve final exam scores
  - Neither did use of study materials, which suggests study materials may not have been that helpful
    - Would badges improve scores if connected to better study materials?
- Intrinsic and extrinsic motivations predicted final exam scores in the WRONG direction
  - Problematic measurement?: Items measured during test
    - Social desirability?
  - Third variables (e.g., stress)?

Questions?

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Thanks!