

DELPHINIUM CASE STUDY 1

1. WHAT WAS THE PROBLEM?

TECH 1010, Understanding Technology, was a gateway general education class that had high failure rates.

2. HOW DID THE PROJECT LEADERS APPROACH SOLVING THE PROBLEM?

Increase student motivation through Delphinium gamification inside Canvas courses, specifically the elements Grade Tracker, Outcome Tracker, and Prize Boxes (see Figure 1).



Figure 1: Images of Delphinium's Grade Tracker, Outcome Tracker, and Prize Boxes. Grade Tracker is a data visualization showing a blue bar for how many points a student has earned and the resulting grade. Students start at 0 points and an E grade, as points are earned, the bar raises. Outcome Tracker presents the student with a matrix view of course content and at a glance, students can see their progress on all modules, assignments, and course outcomes. Prize Boxes are 10 celebrations that are unlocked when students earn specific point thresholds.

3. WHAT WERE THE RESULTS?

This study included 451 (n = 317 in the control group, n = 134 in the treatment group) undergraduate students enrolled in 14 sections which had 13 different teachers. Students in gamified sections outperformed those in non-gamified sections on every academic measure of interest for this study. They remained in the class at a higher rate, passed the class at a higher rate, and averaged higher scores.

Withdrawals

Gamified sections showed a 67.6% change improvement in withdrawal rate over non-gamified sections (13.9% in non-gamified sections and 4.5% in gamified sections) [$p < 0.005$, $d = .30$].

Failures

Gamified sections showed a 47.4% change improvement in failure rate over non-gamified sections (28.9% in non-gamified sections and 15.2% in gamified sections) [$p < 0.000005$, $d = .48$].

Dropouts

Gamified sections showed a 65.8% change improvement over non-gamified sections (18.7% in non-gamified sections and 6.4% in gamified sections) [$p < 0.00005$, $d = .47$].

Performance

Gamified sections showed a 10.1% change improvement over the non-gamified sections (67.2% in non-gamified sections and 74.0% in gamified sections) [$p < 0.005$, $d = .40$].

Note, two other measures were explored to explain the intrinsic motivation that gamification elicits (Self Determination and Flow Theory) and the evidence did not support these theories.

4. WHAT ARE THE NEXT STEPS?

This study provided further evidence that gamification can improve academic outcomes significantly (Asiksoy, 2018; Chapman & Rich, 2018; Hamari et al., 2014; Koivisto & Hamari, 2019; McGonigal, 2011; Seaborn & Fels, 2015; Vansteenkiste et al., 2009). Continue more deployments of Delphinium to build evidence of its use to improve student learning outcomes and satisfaction. Conduct further research exploring the theoretical framework of gamification such as cognitivist and behaviorist theories in addition to the humanist (Self Determination and Flow) theories considered here.

5. WHO TO CONTACT FOR MORE INFORMATION?

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