

Supporting Students' Autonomy through Gameful Course Design

Stephen Aguilar, Stuart Karabenick,
Barry Fishman, & Caitlin Holman
University of Michigan

USE Lab
Digital Media Commons



Game-Inspired Course Design

Research has shown that videogames can be very motivating (Ryan, Rigby, & Przybylski, 2006), and educators have begun apply game design principles (see Gee, 2003; Deterding et al., 20011) to classroom contexts in hopes of increasing student engagement and motivation. Researchers have also begun to study the effects of these designs (e.g., Salen et al., 2011; Martinez et al., 2012) and also support their development through online Learning Management Systems (e.g., *GradeCraft*: Holman, Aguilar, Fishman, 2013).

"Gameful" courses work because they support student autonomy—an adaptive student outcome (Ryan & Deci, 2000). This approach is different from "gamification," which simply adds extrinsic rewards to existing learning environments (Figure 1). The objective of the current study is to examine how a particular gameful design supported student autonomy, as well as understand other adaptive student behaviors it fostered.

Figure 1. To "gamify" a course one layers on extrinsic elements. To make a course gameful one must redesign it.



Methodology

Data were collected through an online survey administered to 299 students at the end of the term; 232 (78%) students completed the survey (see Table 1). A 1-5 Likert scale (Not at all true - Very true) was used on all survey items. Demographic, achievement (e.g., grade point average), and LMS use data were also included and matched to survey data for final analysis.

Table 1. Demographic information and items used to measure variables of interest.

Sample	Survey Measures
College Students (N = 299)	Autonomy: "I have more control over my final course grade because of the grading system."
60% Male 40% Female	Effort: "The grading system encourages me to work harder than I would in a different kind of grading system."
50% Freshman 36% Sophomores 11% Juniors 2% Seniors 1% Not Reported	Exploration: "The grading system encourages me to work on assignment types I would normally avoid."
	Fairness: "I believe the grading system is fair to students."

Assessment System Design

The grading system supported student autonomy by allowing students to determine how each of four possible assignment types were weighted towards 60% of their final grade (Figure 2). "Badges" were offered as a means to encourage certain academic behaviors (see Figure 3 for two examples). Figure 4 describes one possible assignment configuration within the course.

Figure 2. Students given control over 60% of their grade. 40% still determined by traditional assessments

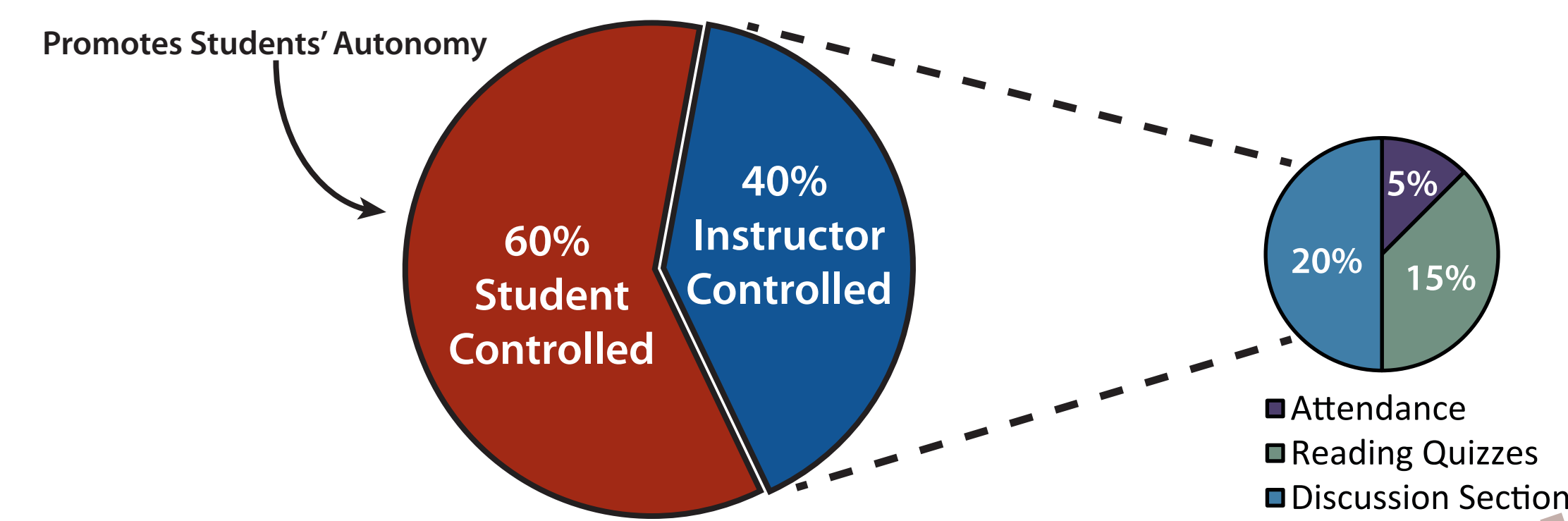


Figure 3. Examples of optional badges

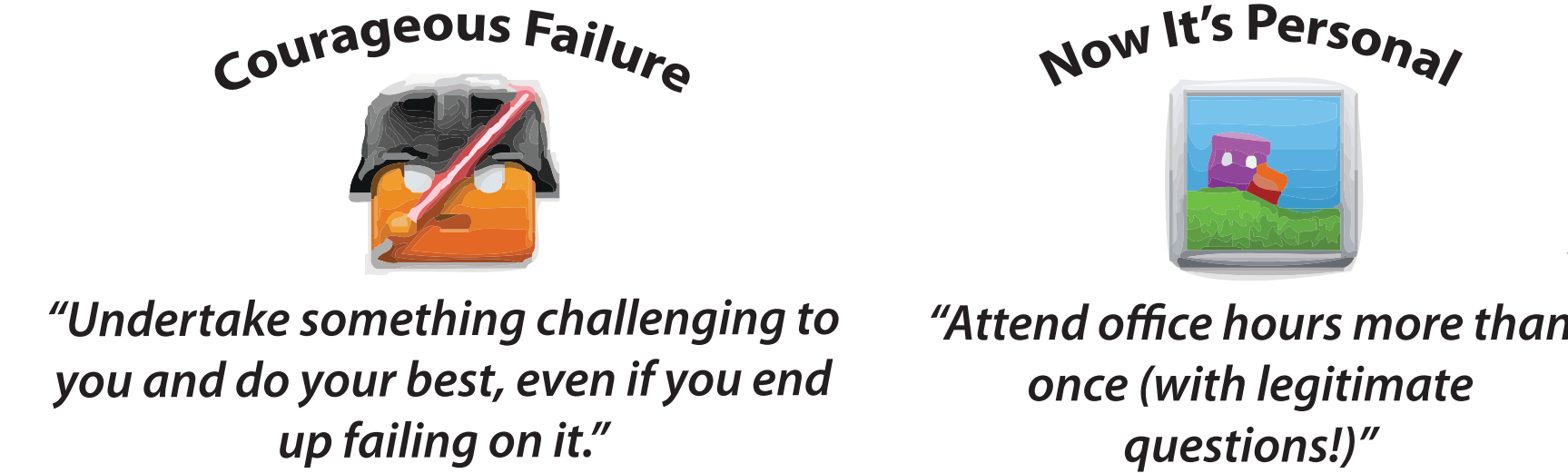
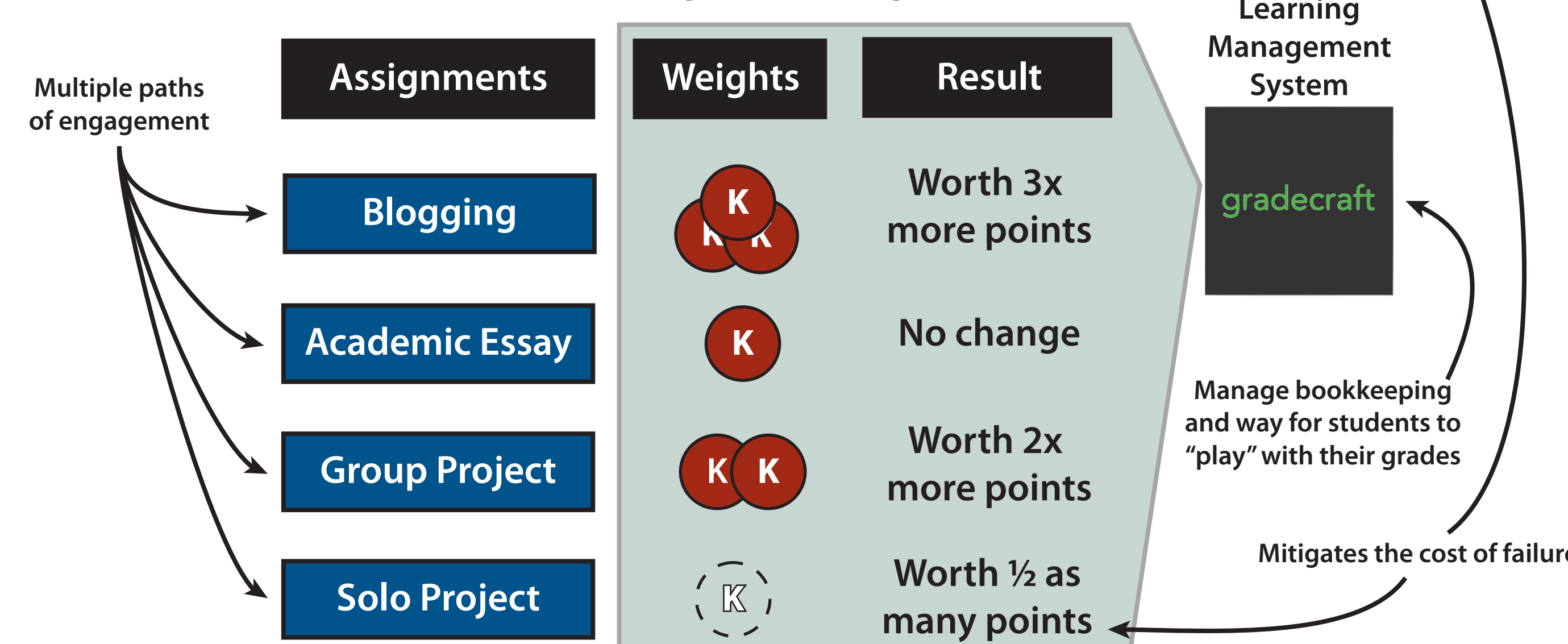


Figure 4. One possible distribution of assignment weights.

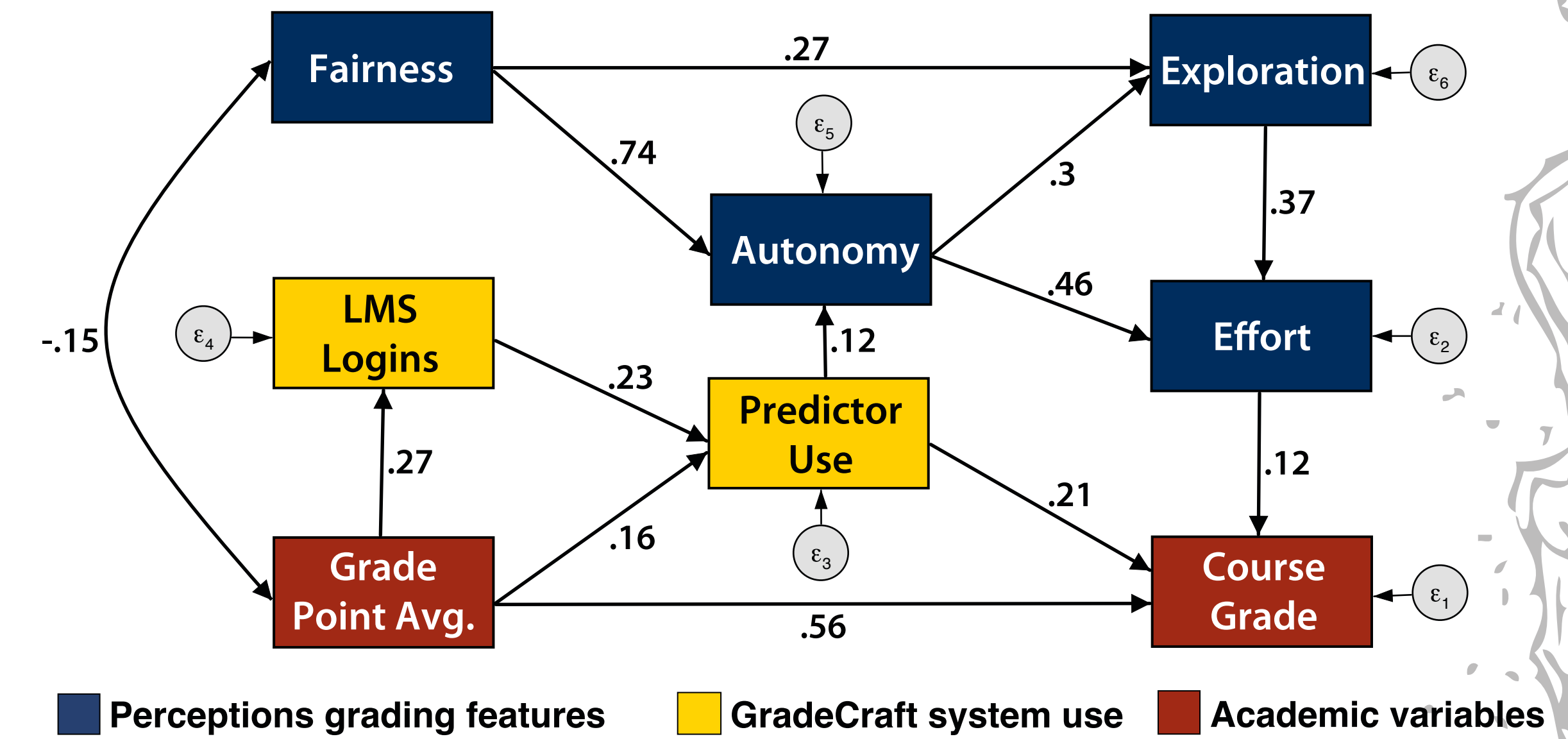


Note: In this example, weights were not assigned to the solo project. Students were given roughly 5 weeks to determine their optimal configuration before being "locked in."

Results

Path analysis (Figure 5) indicates that autonomy is both an outcome of students' perceived fairness of the assessment system, as well as a direct predictor of student exploration, student effort, and an indirect predictor of final course grade. Grade point average understandably predicted final course outcome, as well as students' engagement with the LMS. Students' use of *GradeCraft*'s "grade predictor" tool also had a direct and positive relationship to autonomy.

Figure 5. Path model indicating the central role autonomy plays in adaptive outcomes



Note: only significant paths and their standardized coefficients are shown. The model fit well: $\chi^2(24, N = 226) = 26.6, p = .34, CFI = .99, RMSEA = .02, SRMR = .04$, suggesting that the proposed model is consistent with the observed data. "Predictor use" refers to students logging into the *GradeCraft* LMS and using it to "play" with various configurations to determine their optimal path.

Discussion

The core orientation behind much of this game-inspired design work is the willingness to reimagine—to change—the nature of the tasks given to learners, and to do so in a manner that supports their autonomy.

Evidence indicates that gameful approaches support student autonomy and provide the "space" for learners to feel encouraged be more effortful which leads to more engagement. Self-Determination Theory provides an appropriate theoretical frame in which to examine game-inspired design. Future studies will include greater attention to how gameful designs can support competence and belonging.

Acknowledgements

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