Bug-fixing Game-like Syllabi: Evaluating Common Issues and Iterating New Pedagogical Mechanics

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ABSTRACT
This article examines attempts at game-based courses over the course of several semesters from the spring of 2014 to the spring of 2015 to discover how the fissure between gameful course plans and/or syllabi and the day to day operations of the classroom might be overcome. It examines the creation of teaching goals for gameful courses and how pedagogical methods must be constructed to meet curricular goals while creating a playful classroom atmosphere. Previous investigations argued that syllabi patterned after role playing game reward systems failed to capture student attention due to several factors; confusion about how to use the syllabus, the lack of game mechanics in the classroom experience, and the lack of intrinsic student motivation for exploring topics. This article proposes other, more directly interactive, gameplay structures to add to courses that create gameful learning environments for implementation at a variety of learning levels.

Categories and Subject Descriptors
I.6.8 [**Types of Simulation**]: Gaming - K.3.1 [**Computer Uses in Education**]: Computer-Managed Instruction (CMI)

General Terms
Measurement, Performance, Design, Reliability, Experimentation, Human Factors, Verification.

Keywords
Gamification, game design, education, learning, intrinsic motivation, course design, iterative processes.

1. INTRODUCTION
A popular idea among game design instructors for the past several years has been the game-like or gameful syllabus. Often cited as an extension of gamification, these syllabi use game mechanics as a means for improving student engagement and enhancing student motivation to do industry-relevant coursework. De Schutter, in a review of gameful instruction methods, highlights the need for such efforts to go beyond adding a layer of what Ian Bogost calls "the easy, certain, boring aspects" of games [12] – rewards, badges, achievements, etc. - to add meaningful game elements to course syllabi [14]. Likewise, Cheong et al. argue for six engagement factors from digital games to be included in e-learning systems to be truly effective: fun (enjoyable experience), social (support from other students), identity (everyone has a visible role), challenge (competitive drive created by social pressure), structure (clear and acceptable objectives and constraints) and feedback (explicit feedback of achievements) [3] Likewise, Stott and Neustaedter, in their aggregate review of several gamified classroom methods, highlight successful gameful classrooms as providing freedom to fail, rapid feedback, creating a sense of progression, and storytelling [17].

A popular model for gameful classes are Lee Sheldon's "multiplayer classrooms", named for their shared design elements with massively multiplayer online role-playing games (MMORPGs) [15]. Sheldon's own syllabi center on MMORPG-styled grading systems that have students begin as a "level 1 avatar" with 0 experience points (EXP) – analogous to having a failing grade in the course – and working their way to higher levels by completing work tasks ("quests") both in and out of class. Sheldon's syllabi utilize the inherent challenge of classroom work as an environment for his games. Within this game/class world, he gives opportunities for player/students to gain points from a selection of both individual and group projects that are listed in the course syllabi. Likewise, opportunities exist for students to attempt certain assignments multiple times to both achieve additional points and fix previous mistakes.

This article gives a report of several semesters of gameful syllabi use from the spring of 2014 to spring of 2015 in which the instructor utilized *Multiplayer Classroom*-styled syllabi in a series of collegiate game design courses. These syllabi were created to solve existing classroom issues by combining the reward-system focus of gamified classrooms with more robust game mechanics integrated in how students would interact with the course content. By observing three semesters worth of activity, problematic patterns will be identified and the game syllabi will be subject to industry-style scrutiny and iteration for the purpose of creating a better-playing game for students.

2. DESCRIPTION OF COURSE SYLLABI AND STRUCTURE

2.1 Spring 2014

For the spring 2014 semester, referred onward to as semester 1.0, a client project-based course was to be redesigned. This course was typically a 25-student course with a majority second and third year student enrollment. In the course, students would work in teams of between three and five to create playable game prototypes in response to a real-world client need. The course was open to students in both the game design major and minor, as well as non-majors who had taken lower-level general education courses covering basic game design principles. A major obstacle for the course as taught under "non-gameful" course structures was the need to have students address client needs while also learning the development process.

2.1.1 Pre-Semester 1.0 issues

Previous explorations of such courses have identified similar challenges. In one study, it was found that spending half a semester preparing for the design project through lectures and tutorials was more effective than beginning the course with the project and allowing students to work on it for the entire semester. In the semester with more guidance, students found better solutions to client problems in shorter amounts of time, contrary to previous assumptions that more time would yield more polished games [20].

In the non-gameful iterations of the client project course, a major challenge still present was balancing the necessity of learning development software with the understanding of what makes a well-designed game. While client-based persuasive game projects frame course content with easily-understood criteria for success, it was found that they further constricted the time that instructors could use to prepare students to develop games. Likewise, students felt that while they understood the goals of development, they had little notion of how they should best divide the work of game making. In some cases, in-class tutorials in game engine software was irrelevant for a student who had volunteered to create art or sound assets. Non- major students felt they had little to contribute as they did not have the training to confidently adopt a production role.

2.1.2 Summary of utilized gameful mechanics

For the redesigned course, gameful methods were proposed to solve three major issues: the need to juggle training and course content, vague roles for members of each student developer team, and unbalanced levels of experience between students in the game major and non-major students. The course would adopt a grading system styled after Sheldon's level-building style system where students would start at level 1 with no EXP, then move upward as they do course-relevant tasks. Where this course's design would diverge would be in team management: students would work in "guilds" of four where each member had a specific role. These roles were Mage (programmer), Warrior (artist), Summoner (sound designer/composer), and Paladin (team manager.)

Each of these roles came with a unique list of side quests the student could adopt to earn points. Accompanying the quests were web hyperlinks to relevant tutorials or content to help complete the quest. Each list of quests was a set of tasks that a person on a development team in the student's position would accomplish during a project [1]. For example, an artist could gain 15 points for creating a 2D environment art tile sprite that could be used to build levels in the group's game. This quest and others in each list could be repeated as many times as the student liked depending on how many of each asset needed to be produced.

2.1.3 Scaffolding goal structure

Beyond gamified quests common to other examples of gameful syllabi, this class utilized hierarchically structured quests to illustrate to students the requirements of a game development project. This structure creates a hierarchy of short and long-term quests such that content generated in a student's individual quest (an immediate, short-term quest) could be utilized to complete their teammate's quests, and ultimately contribute to final deliverables for the project [1, 21] (a long-term quest.)

Borrowing from Howard's "rod of many parts" narrative structure [8], where a hero must collect and assemble disparate parts of magic relic to complete a quest, the deliverables for the final game project were listed as "wizard's artifacts" that the students would have to craft to properly complete the game. These "artifacts" included creating a design document, building the player's method of interactivity with the game, creating the game's front-end UI, a trailer, and other elements.

2.1.4 Other additions to the Semester 1.0 syllabi

After creating the mechanics for the project-based course, other gameful syllabi were created for two lecture courses – one on basic game design principles (N= 45) offered to students outside the game major and another on game design history (N= 50.) These additional tests were created to try the gameful syllabus model with more traditionally structured college courses and to help manage a smaller scale game development project utilized in the history course.

Rule variants tested in these courses included "random guild battles" in the basic game design course, where guilds would be randomly chosen via die roll to debate a game industry-relevant topic. When students wrote papers, they had the opportunity to do up to 2 drafts of their paper for a flat rate of 50 points per draft. This emphasized gameplay-like behaviors of practicing a game until the player reaches proficiency. The history course likewise tested "earnable spells", which allowed students to earn the ability to modify their quiz scores in different ways as they leveled up in the class, and teamwork quests that encourage students to study together for quizzes and do research as a class.

2.2 Semester 1.0 outcomes

Viewed as a "first playtest" for these specific gameful syllabi, the semester 1.0 semester highlighted both pitfalls of the method but also many promising insights for future courses. As observed in Sheldon's own case studies [15], the added game "layer" both intrigued and excited students coming into the course. Likewise, the leveling-based grade system generated a measureable increase in student performance, reflective of Denny's studies of similar systems on student engagement [4]. In the basic game design course and game history courses, where student performance was typically in the B to C grade range, students were scoring in the B to A range.

The client project-based course showed a marked improvement over previous semesters. Where project completion rate was typically at 50-60%, all groups in the gameful iteration of the course had a functional game prototype to demonstrate to clients. The role-specific quests were cited as having a positive impact on students' ability to understand the work that needed to be done in a game project, allowing them to produce games that were more

complete than in courses where they were told to simply "make a game." Likewise, based on client needs, groups were also able to complete a non-digital game in addition to the digital project.

In the other courses, students who engaged with the game system felt that they could better explore the related material and had opportunities to find new material to utilize in class assignments. Students responded very positively to assignments which had low stakes but high payoff, such as the paper drafts, which improved their performance on major assignments like term papers, etc. Perhaps not surprisingly, students that undertook the paper draft side-quests also scored higher on the final paper submission and had better quality work than those students who did not do the side quests.

2.2.1 First playtest flaws

The flaws in this iteration of gameful courses were: a lack of prompt feedback for assignments, difficulty for some students understanding the concept of self-directed side quests, and a lack of motivation to take on collaborative class-wide quests. As noted in previous explorations of gameful syllabi, grading courses where students may freely explore content by doing non-scheduled quests can be a burden on instructors [3, 13, 17].

Previous solutions have included: utilizing student teaching assistants for grading while the instructor focuses on managing the game itself [3, 13] or implementing an online grade tracking or leaderboard system [3, 14, 17]. As neither was available, the instructor had to balance grading and game administration for multiple courses. In cases where assignments with longer grading time – quizzes, papers, essays, playable game projects, etc. – were utilized, feedback lagged and elements of the course's game feel were lost [18].

The next issue was one of perception of the gameful course format. In the client-project course, significant time was required to introduce students to the new format, though the explicitness of the quest lists for specific group members isolated this problem to the beginning of the course. The syllabi for other courses, however, did not have the same impact and reminding students of the format became an extra task throughout the semester. One student even inquired late into the semester what they could do to undertake "all those extra credit assignments in the syllabus" – highlighting a major problem of perception of quests' necessity as a core mechanic.

Student feedback showed that while there was an understanding that the syllabus had a unique new format, they ultimately did not read it in detail or keep it with them throughout the course. Students felt that they could rely on the instructor to remind them of all relevant deadlines. However, for many of the side-quest assignments deadlines did not exist, so many went unanswered. A major reason for this was once again – elements of regular classes impeding upon the game world and thus breaking its "reality" [24]. Despite its unique features, the syllabus was typed and printed in a format similar to syllabi for other courses, and thus visually communicated a message contradictory to its actual content. This created a perception problem for students that the course should be addressed like others in their schedules and not played as a game.

Lastly, while there was a variety of achievements and teamwork-based quests in the syllabus, few students in the basic game design and game history courses adopted more individual quests. As the purpose of these quests was to inspire teamwork and collaboration that was rare in previous iterations of these courses, gathering data on them was considered a priority. Likewise, Sheldon's case studies with similar mechanics showed an increase in class collaboration that would have direct repercussions in real-world contexts [15].

Student feedback showed that student bias against group work from previous classroom experiences negatively affected their willingness to address the quests. One ignored class-wide achievement gave every student in the course generous EXP bonus if 80% of students would give a short presentation on a useful tool or resource for game developers. In response to this, students argued that they felt it was unfair to reward the remaining 20% for work done by the 80% and thus the class generally agreed that they would ignore the mechanic. Likewise, students felt that the points gained from these quests were not enough of a reward compared to the needs of forming a team and collaborating.

2.3 Fall 2014

With the experiences from the first semester of gameful syllabus teaching, a second study, referred to onward as course 2.0 was proposed to confirm several of the results in a new teaching environment. A syllabus for a game history course (N= 20) was created for use at a different university from the one in the semester 1.0 study. To test the validity of the method itself, the content of the syllabus from previous courses was kept intact with minor balancing issues made to the points offered for quests. This allowed the instructor to record the semester as a control in the new academic institution and evaluate whether lacking mechanics from the previous semester were due to flaws in the game design or due to student personalities.

One change that was undertaken was the presentation of the syllabus material. Rather than a typed text document, the graphic design of the syllabus would resemble a role-playing game rule book similar to those in the *Dungeons & Dragons* series [6]. The intent was that this format would better communicate the necessity of the syllabus in day-to-day class interactions.

Rather than adding new mechanics, this semester also allowed the opportunity to apply selective gameful class mechanics to classes in other subject areas. The chosen mechanic to be studied was the low-stake practice assignment mechanic.

2.4 Semester 2.0 outcomes

Surveys were conducted to learn how students felt at both the beginning and the end of the semester with the game mechanics utilized for the course. These surveys measured students' level of motivation, curiosity for the method, skepticism, annoyance, intimidation, and excitement for the method at the beginning and end of the course on a Likert Scale. Similar to De Schutter's focus-group stylized method [14], students were asked whether side quests helped them feel motivated, whether they enjoyed them, whether they felt more engaged by them, or if they felt the quests were unnecessary. Lastly, students were asked a series of questions about what element of the course they felt most motivated by, which quests they did not choose to do and why, their perception of the level-building grade system, and the level of gamefulness in the course itself.

2.4.1 Student perceptions and reviews of content

Respondents feelings of motivation and excitement due to the gameful syllabus format were mixed at the beginning of the course,. This mixed reaction closely resembled the spread of initial assumptions about the course, where the numbers of

students reporting a lack of motivation was nearly equal to the number reporting the assumption that the course would be easy because it was about video games. Towards the end of the course, students reported feeling both increased levels of positive emotions such as excitement and curiosity about the course, but also increased anxiety and annoyance. Students also reported that the requirement to earn 2000 points to earn an "A" grade when starting from 0 was daunting.

Reviews of various side quests and grading methods were mixed. The majority of students enjoyed the rulebook syllabus, working in guilds, and having special roles for game projects. Students felt that assignments with strict deadlines, such as weekly homework assignments, were distracting and unnecessary when compared with freely adoptable side-quest assignments. Achievements and earnable bonus spells suffered from underutilization again, confirming that those elements of the system are themselves flawed and will have to be redesigned.

2.4.2 Student motivations and adjusting course content to meet them

When asked about their motivations in the course, earning a high grade was the most checked response, while there was an even split among 2 other choices: trying new things and game making. While this confirms what many believe to be a preconception in modern students towards a Grade Oriented (GO) approach to college courses [19], it also highlights an underlying Learning Orientation (LO) – a desire to more deeply understand course material.

These findings are consistent with in-class discussions with students regarding the final project for the course. Originally, the syllabus contained directions for creating a game pitch consisting of a PowerPoint presentation, a design document, and optional concept artwork. However, all but one guild requested the opportunity to create their own video games. The class/job quest system from the semester 1.0 client project course was added to the existing syllabus as an "expansion set" to the original rulebook. It featured directions for each guild to adopt job-specific roles, links to tutorial content, and directions for fulfilling each team role.

Despite common development difficulties, each group completed a game prototype for the course final. Students were encouraged to emulate the style of historic game consoles, and the results included a surreal ZX Spectrum-style maze game and a Sega CD-style adventure game about making good choices in college that featured full motion video (FMV) scenes.

Other observations confirm many of the findings from the previous semester. Quests that were not utilized by students were the resource-gathering achievement that was likewise ignored in the 1.0 iteration of the course, despite being worth more points. This, compared to the desire to take on game projects over game pitches, suggests that LO behaviors might best be gleaned when instructors design opportunities for collaborative content generation or research-backed design projects rather than pure research.

The paper draft quest was very successful in the fall semester as it had been in the spring. Coupling this with the observations about the LO response to game making, it can be theorized that students develop desired LO habits in response to low-stake exploratory projects that add up to a graded whole. In the case of the paper drafts, students understood that the optional drafts would garner points, but also improve the quality of the final product. Likewise, the game design students eagerly farmed points from repeatable game development quests even though doing so was much more work intensive than writing and presenting a pitch. These observations suggest future opportunities for more LO-responsive mechanics in gameful course syllabi.

2.5 Spring 2015

The insights from the semester 2.0 semester were integrated into two entirely new courses for the spring 2015 semester, referred to onward as semester 3.0: a fourth year undergrad and graduate-level game studies course (N= 17) and an introductory 3D modeling course (N=20.) For the 3D course in-particular, the instructor was interested in seeing how the gameful syllabus would work in a software-training course. Previous software-based courses suffered from students' different paces at which they learned tools – students proficient with the software would be far ahead of tutorial demonstrations while struggling students made moving forward impossible. It was hoped that setting goals via semi-weekly student projects while offering self-directed supplemental side-quests would help alleviate these issues.

For the game studies course, it was determined that rather than instructor-led lectures that had lessened the gameful feel of previous semesters, course content would be crowdsourced to the students. As argued by McGonigal, crowdsourcing not only alleviates individuals or small groups from managing large tasks, but creates a sense of agency for large groups to solve complex problems[11]. The hope is that by tasking a large group with complex tasks, such as creating lectures and leading class discussions, students will train one another to understand content – the pleasure from which is an emotion known as *naches* – and feel pride over the work they have done – known as *fiero*.

Each class tested a new variant on the RPG-based gameful syllabi for accomplishing their teaching goals. For the 3D course, every two weeks, students would have a 3D modeling project to accomplish such as modeling a chess set, texturing a space ship, creating an interactive scene, etc. These major class projects are supplemented with smaller-scale side-quests that offer instruction out of the classroom on 3D art techniques. For the game studies course, each student was assigned a number. The instructor would roll a 20-sided die at the end of each lecture and the chosen students would lead the class discussion of readings – typically notable game studies papers - for the following week. These students were also responsible for creating cards for a game studies-themed variant of Eric Zimmerman, Colleen Macklin, and John Sharp's game, The Meta Game based on the paper's material.

2.6 Semester 3.0 observations

As of this writing, the semester 3.0 semester is still active, so post-course outcomes are impossible. However, surveys were taken of student responses from the beginning of the semester, so insights from that feedback and the instructor's game mechanic adjustments will be documented here.

Like the semester 2.0 semester, the semester 3.0 semester's progress was tracked via surveys. These surveys tracked students' emotional responses to finding out that the course was using a gameful format and their emotional responses to it throughout the semester. For both courses, respondents' levels of motivation were mixed at the beginning. It was initially assumed that students would feel a higher level of curiosity about the format in the game studies course, since the 3D course was primarily a software-training course. However, survey answers showed that

both groups of students had positive feelings toward the format. Both courses were offered to primarily higher-level students – third year, fourth year, and graduate level – while the semester 2.0 courses that had a more mixed initial reaction had a larger first and second year student population. It is possible that higher-level students are more accepting of experimental course formats.

The game studies course, as an attempt at more classtime-centric and student-moderated gameful learning, is receiving mixed response. On one hand, students appreciate the random chance and opportunity to master the material rather than have it dictated to them by the instructor. From a classroom management standpoint, students are much more eager to discuss the material than in previous attempts with instructor-led lectures. However, some students have commented that they would be more comfortable with a class format in which there are more quantifiable grade-collecting tasks. In some ways, this shows a fundamental difficulty of the gameful syllabus – students are more comfortable in classes in which they are working for scores (under the GO mindset) and are not as comfortable with purely learning-oriented work. A potential method for promoting student-led mastery of material while giving students a notion of grade gathering in a game context may be to add competitive elements such as debate. In this way, students can be encouraged to not just develop presentations of source material, but also to articulate opinions about the material and find other resources supporting their findings.

The 3D modeling course exhibits the anticipated spread in student expertise with the software. However, lessening the instructor-led tutorials in favor of clearly communicated 3D art goals allowed students to work at their own paces. Despite difficulties with the software, most students reached majority of each project's goals by the first week of each 2-week sprint. A new mechanic has been proposed to encourage excelling students to help struggling students – unlockable content. This mechanic allows students to "unlock" added elements to each project that offer additional earnable points if the entire class can reach project goals within a week instead of 2. The hope of this experimental mechanic will be to increase student group work and add an element of *naches* to student collaboration.

3. ALTERNATE SOURCES OF INSPIRATION

These case studies highlight a dissonance in how gameful syllabi are evaluated by students and teachers. On one hand, Sheldon's framework and systems like it address classroom management concerns. In his writings, he reports his first several semesters using his model at various schools a success, citing higher average scores among the students than previous non-gameful classes [10]. Similarly, Stott and Neustaedter's case studies on the topic present games of different types that have been crafted for and reported as successful in their respective environments by instructors for many of the same reasons [17].

De Schutter, however, reports negative student feedback from his own efforts with gameful classes, citing struggles between intrinsic and extrinsic motivation, confusion over course requirements, and problems integrating a sense of gameplay into day-to-day class operations [14]. Observations from the three semesters of gameful syllabi explored in this article find similar problems. For the instructor, gameful syllabi can be a much more effective system for encouraging learning-oriented behaviors and managing class projects, but for students they still feel like class rather than game-like experiences. To understand how to better create playful classroom experiences, game design instructors using gameful syllabi may need to look towards gameful methods employed by instructors in other fields for inspiration.

3.1 Opportunities for deeper role-play

As Jenkins and Squire contend, games have the ability to create powerful procedural simulations of historical contexts that players can explore through their play [16]. Games such as those in the *Civilization* series and others that take cultural systems and embody them in game rules. Likewise, games with historical themes such as *Assassin's Creed II* have been used successfully to give students insight into the real personalities behind in-game narrative events [22].

Beyond utilizing digital games in class lessons, case studies such as those from Sheldon's *Multiplayer Classroom* show how gameful systems may be employed in non-game contexts for deeper role-play opportunities.

3.1.1 Geographic progress through classroom gamespace

One such study from a biology course at Marked Tree High School [15] in Arkansas, United States, demonstrates how classroom objects and teaching tools may be utilized as non-player-characters (NPC's) in a role-playing game system. Instructor Denishia Buchanan utilizes objects such as a replica of a human skeleton and other visual aids as game objects that students can receive "missions" from every day of class. In this way, Buchanan's classroom behaves like the towns in many computer role-playing games, where players earn missions by talking to NPC's. The consistency of Buchanan's space also allows the game to dynamically change and offers a geographic element to the gameplay – students must "travel" around the room to check on when quests are available. While such a model would be difficult for many university-level instructors who do not constant control over their teaching space, opportunities may exist in assignments where students function as NPC's with content mastery that other students must visit. The addition of geographic elements is supported by Squire's research, which shows that many students track progress in games via geographic markers [16].

3.1.2 Games and game-like activities as course content

Likewise, gameful role play in the classroom may be utilized as the "activity" of the course rather than non-game activities such as writing research papers or preparing presentations. Wiemeyer and Kliem recommend the use of "serious games" such as *Genius: At the Center of Power* as students' "hands-on" engagement with course materials. Their findings support previous assumptions of using games or gamification in courses - that they would increase engagement and provide a better understanding of course materials [3, 4, 13, 17] – while also providing a model for interaction with course materials that students found fun [23]. This model differs from gamification systems in how it applies the game to the course from within by making a game application the activity that students use to interact with course content, rather than being rewarded in a game-like fashion for doing typical classroom tasks.

Buckminster Fuller's *World Game* [2] and similar projects designed to have students engage in role-playing scenarios to solve real-world problems are likewise commonplace in social

science classrooms. Similar activities such as Model United Nations and Mock Trial organizations have students engage in simulated civic engagements for which they must research, prepare material, and debate one another for points. In these exercises, students are motivated by victory in the game-like structure of the activity to master provided materials – information on world events, argument procedures, case files, and witness testimonies. Instructors utilizing gameful syllabi should consider looking for opportunities such as these as formats for their own class activities.

3.2 Systems for structuring in-class interaction

A challenge for instructors with difficult-to-simulate course topics or topics whose simulation would involve significant technical expertise, game-like simulation may not be an answer for classroom activities. However, other interactive methods may offer useful supplements for course material.

3.2.1 Debate

Debates offer the benefits of team-based learning with a competitive goal. By framing performance in the classroom activity as something students can win, lose, or be less-prepared for than an opponent, students have an easier understanding of their performance.

The debates undertaken in the semester 1.0 gameful semester required students to work in teams and argue game industry-relevant topics. Each team in the debate would be responsible for providing alternate points of view on topics such as the merits of ludological or narratological approaches to game studies, the virtues of current game genre systems, and others. Team debates offered students opportunities to not only present on existing information, but provided incentive to do further research that could give them tactical advantages.

Similar to the semester 3.0 student-led lectures, debates had the added benefit of encouraging spectator discussion and involvement. On one hand, students not in the debate were encouraged to ask questions of the teams and form their own opinions. Many of these students were themselves caught in the spirit of the competition and became debaters themselves.

3.2.2 Rule or format-based competitions

For writing courses, creative writing professor Hunter Hoskins suggests format-based scoring systems for in-class activities and assignments [7]. The proposed scoring system would take noteworthy writing systems such as Noam Chomsky's Syntactic Structures and others as criteria for rating students writing.

In a column for *Education World*, teacher Brenda Dyck likewise advocates for the use of poetry slams, poetry competitions modeled after popular events at New York poetry clubs in the 1980's, as a format for in-class demonstrations of content mastery [5]. Under Dyck's model, students are given strict rules for how they should formulate their poetry – often style, length, or by having to write it with words clipped from articles, etc. These restrictions force students to concentrate less on the act of writing and more on executing class material through their work. Hoskins's suggestions of theory-based scoring methods may provide opportunities for crafting similar poetry-slam like in-class student competitions. Through such competitions, it is hoped that class periods may both be more playful and offer students clearer systems for success than current gameful classroom activities.

3.3 Not designing like a game designer

Physics professor Phillip Johnson offers an alternative to traditional course gamification by centering his system on teaching goals rather than grading mechanics such as those used by Sheldon and others [9]. Under Johnson's system, students are offered a rubric of what their skills with utilizing course content and methods at different "skill levels." Level 1, which corresponds to a grade of "C", shows the minimal expected expertise that students will have after taking the course, assuming that they participate in all class activities during the semester. Level 2 students, who will earn a "B" grade, are those who apply course materials to in and out of class projects. Level 3 students, who will earn an "A" grade, are those who not only employ course materials in projects, but also apply those materials in new contexts or search out additional resources. An experience point-based grading system is still utilized, but assignments that evaluate whether a student is at level 1, 2, or 3 according to the skill level system provide the most points, and the class is not passable without participating in these evaluations.

Johnson's system is notable as it focuses not on reward mechanics and in-game tasks, but aspirational goals for student skills. In many ways, this method is still game-like in how it emphasizes player capabilities – many RPG players look forward to the day their character earns a new ability – but few game designers would begin from aspirational goals and would instead begin design with mechanics for how students adopt quests. Such an approach more directly addresses LO behaviors by showing students what skills people at each grading level possess rather than rating students on tasks they've accomplished.

4. NEW MECHANICS FOR CLASSROOM ENVIRONMENTS

Both the case studies of gameful syllabi from 2014-2015 reported earlier in this article and the examinations of the non-game design, elementary education, and secondary education efforts demonstrate new possibilities for future forms of gameful syllabi. As stated in the beginning of this article, subjecting previous attempts at gameful syllabi to industry-style iteration and learning from efforts outside of game design can help suggest new directions for gameful syllabi.

4.1 Different styles of RPG

One primary issue with gameful syllabi as found in this article's studies and in De Schutter's work is confusion on the part of students about the requirements for receiving high grades in the course. In many ways, the gamified grading system, where students earn grades by building up from 0 EXP, is to blame. As reported by survey respondents, doing so can seem daunting for students.

Johnson's learning outcome-based skill system offers an alternative to GO gameful systems by offering a system based on LO accumulation of skills. A successful student under this system learns new things rather than merely completing tasks. In this way, we can see how the RPG metaphor apparent in previous gameful syllabi is insufficient for building intrinsically motivated students. Previous systems offer rewards for performing tasks, as is common in RPG's, but as we have seen in surveys, GO students care less about the experiences that tasks provide and more about earning rewards.

In this way, we should look for alternative RPG metaphors for gameful classroom systems. In Johnson's model, a point system

similar to what has been popularly used runs concurrent with a skill-based system that communicates significant progression through the course material. Games that use similar systems include creature-training RPG's like *Pokémon*, where players can develop their monsters via a traditional leveling system, but specific levels are rewarded with an increase in monster power and capability through "evolution" to a new form.

Purely emulating this system risks becoming another underutilized reward. However, Johnson's utilization suggests potential uses of "unlockable content" in the form of new side-quests that open up for students when they master core competencies in the course. A minimal version of this has already been suggested for the semester 3.0 3D art course, but further iterations will test this idea as part of the course's actual grading system.

4.2 Are RPG's the right type of game?

Given the difficulties of managing large numbers of players and the imbalance between the level of effectiveness for teachers with the level of fun for students in RPG-styled gameful courses, it is possible to wonder that if these types of courses are to continue, are RPG's the correct type of game to model classes after? Already we have seen new mechanics emerge through studies of poetry-slam style competitions and suggestions over rule-based content generation criteria. Rather than framing these exercises as player vs. players (PvP) role playing battles, it may be worthwhile to find other models for more dynamic in-class competitions.

Using Hoskin's suggestions of rule-based writing styles as criteria for measuring students' skill with course material and competitive classroom activities as models, we can begin to draft new types of classroom mechanics around popular action game genres. For example, an instructor might create a slam-formatted writing competition where two teams of four students each represent a style system. Each member of each team has a member of the opposing team that they are responsible for "blocking." If one member of the team representing Chomsky's method creates a passage, the member of the opposing team representing Strunk and White's *Elements of Style* set to block them must respond or the Chomsky team scores a hit. If the *Elements of Style* player blocks, their team can then return the attack. This pattern continues until one team loses their hit points (HP) and is knocked out. In this way, the teams' competition represents a fighting game like *Street Fighter II* much more than an RPG and can be more dynamic in how it utilizes the mechanics of attacking, blocking, and parrying.

This theoretical method has other advantages regarding how it structures goals for students and what kind of learning it encourages. Student teams who excel at this style of classroom competition will be motivated by the desire to be the best players in class, rather than earning points for high grades. Likewise, they will have to work together to internalize their content rather than performing it by rote on due dates then abandoning it. This is just one potential example, but it shows how creative instructors may find new ways to create gameful exercises that utilize what is successful about current models while creating fun classroom dynamics.

5. CONCLUSION

Through these explorations, we have explored previous attempts at gameful courses to understand how they attempt to move beyond gamification to have more meaningful interactive elements. We have seen several semesters' worth of iterations on one set of gameful syllabi to learn how such syllabi may react to differences in student population, course requirements, and student perceptions. Likewise, we have seen how despite iterative efforts, these courses may still be improved upon. We have learned that some consistent challenges remain such as difficulty of managing large amounts of course content without either human or computer assistance, struggles with students' motivations in courses, and problems with students understanding of new course formats.

Lastly, we explored several formats and ideas from outside the typical sources of research in gameful syllabi to discover opportunities for implementing new game systems in gameful syllabi. Among these were systems that encouraged experimentation with more in-depth role plays, alternative formats of role-playing-game, rule-based content generation systems, and systems that abandoned the RPG to adopt the mechanics of other game genres. It is hoped that instructors will find these explorations useful in planning their own gameful courses and creating new fun learning experiences.

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