Gamification in Blackboard Learn

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Gamification can be defined as "the use of game mechanics and experience design to digitally engage and motivate people to achieve their goals" (Burke, 2014). Another definition states it is "the use of game mechanics and dynamics in nongame contexts" (Deterding, 2012). The application of gamification in commerce is well known through customer loyalty programs, where purchases grant points and open rewards (Saran, 2015; Hofacker, de Ruyter, Lurie, Manchanda, & Donaldson, 2016). Websites often track activity and reward users, such as the community.blackbord.com site that grants badges and leaderboard status.

Engagement of a website user or a commercial customer can have tangible value in creating behaviors that lead to specific results, such as sales. How about academic classrooms, can we use more engagement there? Yes! Academic programs struggle with difficult problems rooted in engagement.

What is the problem we are trying to solve?

While the government warns about a deficit of skilled workers (President's Council of Advisors on Science and Technology, 2012), many academic programs, including STEM, report high attrition rates, low enrollments, and low program completion rates (Chen & Soldner, 2013). A report by U.S. Department of Education in 2013 showed that in STEM 48% of bachelor's candidates and 69% of associate degree candidates left field of study or left college all together.

Other problems leading to low engagement include student boredom, alienation, low achievement, and high dropout rates (Fredricks, Blumenfeld, & Paris, 2004; Swap & Walter, 2015). Attendance at college level continues to suffer despite the use of modern teaching methods (Kelly, 2012). Research studies report uninviting atmosphere, discouragement based on participation in weed-out classes, and perceived lack of relevancy (Lander & Gates, 2010).

Student engagement was shown to be linked statistically to the rate of student graduation (Price & Tovar, 2014).

If this wasn't enough, STEM fields are often seen as unwelcoming and chilly (Christe, 2013). Students report being humiliated and insulted by professors. An antagonistic long-term relationship is forged with faculty. Sometimes faculty view student withdrawal from STEM as a sign of successful instructions. Well-qualified students purposely abstain from careers in STEM (Chen & Soldner, 2013).

It is important to note that advanced college courses often experience fewer engagement problems. By the time students register for advanced courses they already committed to the subject matter and the academic program. They often were weeded-out in introductory courses and their determination to self-activate engagement may be high. However, college introductory courses are a prime candidate to adopting gamification strategies both in short-term through active learning within lectures, and in long-term by creating semester-long game mechanics. Faculty, who teach advanced courses, often tenured faculty, may not see the urgency and need for focusing on engagement. Faculty, who teach introductory courses, often contract or part-time faculty, may have a positive view of gamification or other modern instructional methods, however they may not have the permission from department authorities to innovate.

Why gamification and why now?

Key developments in recent history make gamification possible in schools. These include the emergence of positive psychology, popularized books about human intrinsic motivation, availability of digital gamification tools, and hiring faculty who interacted with computer video games in their youth.

At the end of 1990s positive psychology became a scientific field. In contrast to traditional efforts of making mentally ill people cope or improve, the new field focuses on helping healthy people grow and thrive. The theory of "Flow" by Csikszentmihalyi from the University of Chicago (1991) set the direction for the field in identifying a mindset of blissful productivity. The activities that produce the flow occur in the special zone between boredom and anxiety. The challenges are not too easy and not too difficult.

This direction was noted by many authors in the business field. Books were published on how to improve well-working companies and help to improve employee experiences at work. Some examples include: "Good to Great" by James Collins. (2001); "The Drive" by Daniel Pink (2009); "Reality Is Broken" by Jane McGonigal (2011); "Where Good Ideas Come From" by Steven Johnson (2010). These efforts helped to disseminate the principles of Positive Psychology and popularize it.

Gamification is also possible today because of the release of digital tools, which educators can easily adopt. Such tools include: ClassDojo (2011); Mozilla Open Badges (2011); ClassCraft (2013); GradeCraft (2013). Recently, as part of a case study involving 501 students in 4 semesters at Grand Valley State University a new tool was released called MyGame and faculty are invited to adopt it (Machajewski, 2017).

Finally, individuals who are being hired into teaching positions at universities during their youth had an opportunity to use computerized video games. The era of Atari in the 70s and 80s helped people realize the level of engagement that video games provide. Just as Prensky (2009) claimed that students get quickly bored at school because they know the high engagement experienced in games they play at home, similar idea applies to faculty. Faculty who remember the video game engagement may seek out opportunities to create it both for themselves and for

their students (Granic, Lobel, & Engels, 2014). The Entertainment Software Association reports that females make up about 41% of the sampled gamer population with the average age of 44 years (Entertainment Software Association, 2016). The average age of a male gamer is 35, compared with 30 years in 2013. Research from the American Psychological Association by Granic tells us that playing video games, even the violent ones, is beneficial to engagement and learning (Granic, Lobel, & Engels, 2014).

Therefore, the stage is set today to adopt gamification in Higher Education because of faculty who are welcoming the idea and students who demand it. It is not to say that games are not liked or welcomed by previous generations of faculty. The period of 1960s and 70s was full of game revival and focus on playful thinking. "The Well-Played Game" by Bernard De Koven (1978) is a cornerstone of ludic studies today. However, the coupling of modern technology in producing immersive feedback environments and scaling game dynamics and mechanics over large populations of students make this time in history especially fruitful for gamification.

Blackboard Learn: Quiz Tournaments

A simple use of gamification in Blackboard Learn are Quiz Tournaments. An assessment is setup based on a large pool of questions. Vendors, such as Cengage, often provide large pools of review questions based on the textbook. A pool of a thousand questions based on multiple chapters is not uncommon. The quiz then is marked as timed for 15 minutes and automatically submitted when the time runs out. This means that students can answer as many questions out of the pool as they can within the 15-min period.

The winner of the tournament is determined in the Grade Center by sorting the quiz column by results. Even if a student views many questions, but answers correctly only a few, the

score reflects only the correct answers. Another benefit of this playful activity is that students can perform it at the time convenient to them. This is not a synchronous activity.

A deadline is placed on the activity and results announced. Students can be rewarded by the recognition, granting extra credit, free points on the actual exam, or any other reward faculty specify. The Tournament can be executed multiple times or multiple quizzes can be created with the same random pool of questions. This Tournament does not require faculty supervision during execution.

Blackboard Learn: Course Reports

Another way to use gamification principles in Blackboard Learn is to turn Course Reports into a gameful activity. While some games are explained ahead of time, others can be executed without student knowledge. In the book "The Drive" Daniel Pink explains two approaches to rewards: "if then" and "now that". The first one is often shortsighted and works for physical tasks. If you do this, you'll get that. However, if students know what the game is about they tend to optimize toward this activity at the expense of more valuable tasks. Therefore, a reward of "now that" type can be of greater benefit. It rewards previous, self-motivated, and desired activity. It becomes a pleasant surprise that is reinforcing good habits.

An instructor in Blackboard Learn can run "All User Activity inside Content Areas" report under Control Panel anytime during the course. During the first week of an online class or classroom course, the report will rank students based on number of clicks reported. This creates a sorted list of students who used Blackboard Learn. The winning student can be announced or rewarded. This game does not have to be played repeatedly in the course, but it helps to create a mindset of immersive feedback in the course.

Blackboard Learn: Adaptive Release

John Fritz and John Whitmer in their article "Moving the Heart *and* Head: Implications for Learning Analytics Research" (2017) call adaptive release a "little known Blackboard tool". This tool lends itself well to creating immersive feedback environments. It creates an IF-THEN logic inside of the Blackboard Learn course.

Adaptive release can be triggered by a course grade, marking content as reviewed, or submission of an assignment before it is graded. One scenario of using this tool in a gameful way is to ask students to explore the Blackboard Learn course content in the first week of the class and find all "mark reviewed" buttons. These buttons would be scattered across the content of the course, but students would know the specific number they need to find. The moment all buttons are selected the adaptive release rules would make a new item available to the student with reward information. In context of the MyGame app (Machajewski, 2017), such feedback would include a text game code, which grants experience points.

Adaptive release can also be used in conjunction with the Grade Center. A game activity can be based on an assignment that students submit electronically. Some assignments, especially completed in external systems, may be difficult to intergrade. In the case study for MyGame in a STEM course (Machajewski, 2017) the external systems included code.org, codecombat.com, and NetApp University. Instead of waiting to verify the assignment, faculty can require that a student takes a screenshot of their progress and uploads the screenshot to the Blackboard assignment. The moment assignment is uploaded adaptive release would again make a game code available.

This does not need to be an academic integrity issue. Yes, screenshots can be digitally edited, but the external systems often allow faculty to login and verify student progress. When

this process is explained to students ahead of time, the problem of cheating is diminished. The benefit of immersive feedback is retained when screenshots trigger adaptive release.

Blackboard Learn: Achievements/Badges

Badges are a way to document skills with higher granularity than traditional degrees or certifications. Mozilla Open Badges allow for public display of the mini-credentials to demonstrate the breadth of interests and accomplishments of individuals. Blackboard Learn implemented badges through functionality called Blackboard Achievements. Instructors can create graphical badges and associated rules, which allow users to earn the credentials.

As an example, a course that teaches Excel with vendor content from Cengage (Machajewski, 2017) a number of options exist for assessment that can trigger badges. Hands-on projects can be graded in the cloud system, theory exams can be delivered through multiple choice questions, and simulation examinations can provide a summative assessment with virtual Excel emulator in the browser. For students who reach 95% or better on the Excel emulated exam a badge is then issued. In turn, students can export the badge into Mozilla Backpack and include it in their LinkedIn profile or personal portfolio.

Other vendor systems such as Duolingo, Pearson, or lecture response system such as Kahoot can be integrated with Blackboard Achievements. The integration takes place through exporting spreadsheets with detailed activity from the vendor system and importing it into Blackboard Learn. The offline grade book export as a spreadsheet makes this possible in Blackboard Learn.

Blackboard Learn: XP Ledger

A new opportunity for gamifying activities in Blackboard Learn is available through the MyGame system. This is an XP ledger software available from game.dataii.com. While Blackboard Learn tracks the official grade, the MyGame system tracks Experience Points (XP). The Blackboard Learn grades and XP are independent. Such points can be granted in any amount to students for peer-instruction activities, Blackboard Learn Quiz Tournaments, Adaptive Release explorations, and other gamefully designed activities. The rewards in the MyGame system include the privilege of requesting late assignments, peer-recommendation for classmates, LinkedIn recommendation by the instructor, and others.

The XP points can be converted into Blackboard Points before the final exam at a conversion rate set by the instructor. In some versions of the game a Boss Level event determines the conversation rate for specific students. Instead of calling the points "Extra Credit", the points are called "Peace of Mind Points" (PofM) in relation to the final exam. Each PofM point is an approximation of a value for an exam question. Therefore, the PofM have a realistic value for students and are associated with relieving anxiety, not focusing on the course final grade.

Blackboard Learn: ECP Program

The next gamification strategy is the Exemplary Course Program maintained by Blackboard Inc. A foundation for gamifying courses is a well-designed course from the perspective of instructional design (Machajewski, 2017). Gamifying poorly designed courses or poorly delivered courses may be a mistake and a setup for failure. Games have a tendency of amplifying good features of a course and amplifying poorly designed areas.

Just as a game requires well-written instructions, a course game requires clear instructions, a statement of purpose to appeal to epic meaning of a game, opportunities for growing competence in the subject matter content, and opportunities for relating to other students through discussions, blogs, or social media channels. The ECP program allows faculty to have their courses reviewed by peers and receive detailed feedback. To set clear expectations for the program an ECP rubric is published with suggestions and expectations for a well-designed course. Courses that meet the rubric requirements receive an award.

Recommendations for Faculty Seeking to Adopt Gamification

When considering gamification in college courses instructional designers and faculty should take advantage of existing frameworks. One such framework was authored by Andrzej Marczewski, a leader in the field of gamification. The Gamification Design Framework Toolkit (Marczewski, 2017) prompts faculty with steps to define the problem, users, and define success. Next, attention is given to the user journey in order to design experiences including behaviors, mechanics, motivations, emotions through action and feedback loops. The process is meant to be continually refined. Using a framework is very helpful in immersing the designer in specific questions and keeping in mind the entire game as an environment for the student experience.

Another framework useful in evaluating the level of gamification in an academic course is the Octalysis framework by Yu-kai Chou (2015). The faculty would ask questions about specific core drives such as Epic Meaning, Empowerment, Social Influence, Unpredictability, Avoidance, Scarcity, Ownership, and Accomplishment. In an Octalysis web resource faculty can assess the level of gamification in their course and visualize it through a graphical display.

In another recommendation, faculty can explore the custom software developed for the Introduction to Computing course at Grand Valley State University (Machajewski, 2017). The

mobile app is free to faculty, who apply for adoption at game.dataii.com. This approach gives faculty a custom mobile application with options for creating their own game missions and long-term player journey development.

Conclusion

A game is well-designed work. This is why instructional design and Blackboard ECP program are important in adoption of gamification in Blackboard Learn. The reciprocal quality of engagement means that as students are engaged by gameful activities, faculty also have an opportunity to rediscover their joy of teaching (Skinner & Belmont, 1993). The self-determination theory asks for purpose, competence, and relatedness in order to validate activity as engaging and satisfying (Ryan & Deci, 2000). When faculty can share with introductory students pieces of their advanced research as game missions, when they can extend a mandated curriculum to findings they are interested in, when they feel they share with students knowledge of a deeper value, when they experience social engagement with students in the classroom, their teaching is revitalized, they are engaged.

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