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Gamifying History: Designing and Implementing a Game-Based Learning Course Design Framework

ABSTRACT

This paper analyzes the development and implementation of a game-based learning course design framework. Drawing inspiration from task-based learning, the framework is structured around four core gamified elements: narrative assignment design; learner discovery; team-based collaboration and competition; and choice through quests. The intended goal of implementing this framework is to improve learner engagement and foster greater learner investment in the course. The framework, developed at the University of Waterloo, was integrated into the course design for—and subsequently taught in—a third-year history course. A mixed-methods analysis was conducted in which students (n = 15) were surveyed, interviewed, and observed throughout the course at different intervals. The results of the study suggest that the team-based nature of the framework and the embedded gameplay elements are most effective at improving engagement for learners, while some form of extrinsic motivation is still beneficial to ensure all learners find completing additional tasks worthwhile.

KEYWORDS

higher education, game-based learning, course design, history education

INTRODUCTION

You are a studious young physician. You have read all the authorities: Galen, Hippocrates, Maimonides, Ibn Sina, and Pliny. You can calculate planetary conjunctions with ease and a mere whiff of someone's urine tells you whether they are too bilious or too choleric. But all your years of study have not prepared you for the sudden attack of plague that has swept through your town. The medical practitioners of the area have all come together to try to combat this fearsome foe. You find yourself a member of a Plague Hospital and with the assistance of the other staff members, you will go on quests, fight monsters, and learn the secrets of this great mortality in order to defeat it once and for all.

As a student in a third-year history course at the University of Waterloo, you are greeted with this message as you open your *game manual* (course syllabus). You and your 14 other classmates are tasked to complete *adventures* (in-class tasks), go on *quests* (assignments), face *monsters* (deliverables), and join a *Plague Hospital* (team of fellow students). These could all be components of any given course,

but are woven together with this overarching narrative to foster interest and inspire engagement through gamification.

Gamification and game-based learning in higher education are becoming increasingly popular (Burke 2016; Dicheva et al. 2015); however, there is little consensus on how best to gamify a learning experience (Girard, Ecalle, and Magnan 2013; Hamari, Koivisto, and Sarsa 2014). Existing models focus primarily on either the design or impact of a given gamification element (Attali and Arieli-Attali 2015; Landers and Landers 2014; Mah 2016) or guide the design of a digital game for learning (Kotini and Tzelepi 2015; Urh et al. 2015). They very rarely examine integration into the course itself (Whitton, 2014) and its alignment to learning outcomes, assessments, or teaching and learning activities. It is important to distinguish here between examples of gamified activities in a class of which numerous studies have been conducted (Attali and Arieli-Attali 2015; Landers and Landers 2014; Mah 2016), and a complete model of game-based learning implementation into a course. We are interested in models that focus on the entirety of the course, merging existing course design frameworks with game-based learning principles. A game-based learning course design framework should seek to create a learning environment that is engaging where learners will be eager to invest time in the course to learn to their fullest potential.

The terms gamification and game-based learning are often used interchangeably (see Hamari et al. 2016; Wood et al. 2013) to discuss a learning environment in which traditional game elements (such as the accumulation of points, tracking player competence with leaderboards, providing recognition via achievements or badges) are applied to a learning environment. We argue that these are discrete terms, with gamification referring to the addition of game-based elements—such as points and leaderboards, conflict, or competition (Whitton 2014)—onto an already established learning activity or assessment. Game-based learning, then, is the integration of game-based principles into the *design of* a learning activity or assessment. Our game-based learning course design framework, as developed in this study, employs the principles of game-based learning to foster engagement in the classroom.

This paper will begin by exploring existing literature on game-based learning and innovative course design practices, and then explain how we have drawn on this literature to develop the game-based learning course design framework. We then detail the results of a study in which we incorporated the game-based learning course design framework into a small third-year history seminar course, drawing evidence from student and researcher perceptions, and finally, discuss its influence and future directions for the framework.

LITERATURE REVIEW
Game-based learning in history
Games are enjoyed by many (Whitton 2014; Wilson et al. 2009), certain aspects of which resonate with different players. Some prefer games that breed competition between players, while others long to be immersed in a narrative that prompts player agency with real consequences. Regardless of the rationale and justification for one's enjoyment of games, the inherent qualities and characteristics of games that make them appealing are in many ways analogous to engaging learning experiences.

Arnab, Lim, Carvalho, Bellotti, de Freitas, Louchart, Suttie, Berta, and De Gloria (2015) align game mechanics with learning mechanics to demarcate which element of gameplay supports which level of cognition. Some are clear: immediate feedback received in games requires analysis similar to the benefits of feedback received in a learning environment. Similarly, collaboration between players is akin

to collaboration between learners, accomplishing goals that could not be achieved alone. Whitton (2014) goes even further by connecting game genres to learning skills, such as role-playing games to decision-making or critical thinking aptitude, and associating adventure games with the development of problem-solving skills.

History as a discipline is no stranger to innovative game-based learning approaches, and in fact has benefitted from embedding game-based learning into teaching for decades (McCall, 2013; 2016). History classes have simulated the economic, political, and social realities of the past through playing games such as *Civilization* (McCall 2016; Shaffer et al. 2005), or *Assassin's Creed* (McCall 2016). These games are not designed with educational purposes in mind; rather, they are employed in the learning experience as authentic gameplay requiring reflection to make connections between the gameplay and the historical content being taught.

Simulations and role play occupy a similar domain to game-based learning, encouraging play, agency, choice, social interaction, and an embedded narrative. These too have been employed in history learning contexts with studies suggesting that simulations and role play can be equally effective for learning gains as lecture-centric courses (Corbeil and Laveault 2011), but that practitioners need to account for unprepared students (Stevens 2015), and the experience itself ought to be accompanied by discussion and reflection with fellow students (Beidatsch and Broomhall 2010).

One need only look to Reacting to the Past (see Powers, Burney, and Carnes 2010) for how game-based, role-playing simulations in history have been well-received and iterated upon to create a wealth of different classroom-based games. Central to games developed for Reacting to the Past is students role playing a specific role and engaging in discussion with other learners to discuss, collaborate, and challenge their ideas while learning about moments in history.

Among these varied examples of game-based learning is a recurring need to allow learners to discuss what they played, interact while playing the game, solve open-ended problems—and due to the very nature of these games—encourage agency and choice for the players. We look then to course design frameworks to aid in formulating these core elements of game-based learning into a framework for course design.

Course design frameworks

There exist many course design frameworks, such as Wiggins and McTighe's (2005) well-respected, backward course design model. In this framework, instructors start with intended learning outcomes and then design appropriate assessments and learning activities to provide evidence that these outcomes have been met. Other course design frameworks have been developed for learning contexts outside of the traditional classroom environment, such as Toro-Troconis (2015) Blended Learning Design Framework (BLEnDT), in which instructors decide which learning outcomes are appropriate for the face-to-face classroom environment and which are better suited to independent work online. Garrison, Anderson, and Archer's (2000) Community of Inquiry framework, while not necessarily a course design framework in and of itself, has been foundational for blended learning course design with its focus on developing social, cognitive, and teaching presence in the online environment.

To date, limited research has been conducted that examines the integration of game-based learning approaches into course design. Mora, Riera, González, and Arnedo-Moreno's (2017) review of gamification frameworks is a useful resource, but of the 40 works analyzed, six were found to be targeted

towards educators, whereas the rest were intended for individuals working in design, business, human-computer interaction, etc. Furthermore, none of the six education-related frameworks explicitly connected the framework to a course design process. Some frameworks are more focused on digital game design: Tan, Ling, and Ting (2007) and van Staalduinen and de Freitas (2011) both propose different game-based learning frameworks, but these are intended for the design of digital games that can be used for higher education. Others are rooted in education, but gamify a single activity, rather than a broader course design (Kiili 2005; Pivec and Dziabenko 2004). Sheldon's (2011) concept of the multiplayer classroom focuses less on the design of the course, and more on gamified elements (experience points, embarking on quests, leveling up). The emphasis placed on collaboration between learners, working together to succeed against the most challenging of tasks, and the creation of a fully active-learning-oriented classroom environment, is of special interest in the multiplayer classroom.

Baldeon, Rodriguez, and Puig's (2016) LEarning-centred GAmification Design Framework (LEGA) (Baldeon, Rodriguez, and Puig 2016; Baldeon et al. 2017) employs backward course design principles to create a gamified course framework. LEGA has five stages: 1) define objectives and target behaviours; 2) describe players; 3) devise fun activity loops; 4) deploy, play-test; and 5) evaluate the effectiveness of the gamification (Baldeon, Rodriguez, and Puig 2016, 3). While LEGA does bear similarities to our framework, it employs grade-based incentivization and is situated in a singular class, not an entire course.

The University of Michigan's Gameful Pedagogy (Gameful Pedagogy 2019) and gameful learning approach shares 10 steps to "go gameful," including defining learning outcomes, choosing appropriate assessments, and establishing achievement levels and grading scales. Although there exist clear similarities between this and our framework, the gameful learning approach is perhaps more adaptable to any course context, whereas the framework we propose focuses explicitly on a team-based approach to learning with the *problem* as the central element of the course that learners work on throughout.

GAME-BASED LEARNING COURSE DESIGN FRAMEWORK

The game-based learning course design framework is structured around four core elements that promote student engagement (table 1):

Table 1. Core elements of game-based learning course design framework and their rationale for inclusion

Element	Rationale
Narrative assignment design	Provides learners with a compelling narrative that illuminates the relevance of what they are learning beyond the theory.
Learner discovery	Prioritizes problem-solving; learners start with a problem and work towards a learner-driven resolution, rather than an instructor-supplied solution.
Team-based collaboration and competition	Students complete tasks in teams, supporting one another within the team. Teams then compete against other teams, rather than individual students against one another.
Choice through quests	Quests (tasks integrated into the course's overarching narrative) provide more complex challenges to students, and coupled with choice, allow them to select which are most meaningful to complete.

All four of these elements are intended to benefit student engagement in the course, not learning. Game-based learning does not necessarily result in meaningful grade-based improvement (see Perrotta et al. 2013; Whitton 2014). Perrotta, Featherstone, Aston, and Houghton (2013) specifically clarify that "the evidence suggests that game-based learning can improve engagement and motivation, but don't rely on games to improve attainment - there is still a lot we don't know about the impact of video games on learning" (ii). If we can engage learners in the course content better, however, their inclination to participate and learn may increase. Many studies focusing explicitly on the benefits of game-based learning make a similar assertion (see Jabbar and Felicia 2015; Ke, Xie, and Xie 2016).

The game-based learning course design framework (see figure 1) proposes a model that can be used to structure the design of an entire course with gamified principles in mind. This framework draws inspiration from task-based learning (Willis 1996), but emphasizes team cohesion and rewards team cohesion; the incorporation of narrative and task choice further immerses learners into the course so that they are invested in the success of their team. Many of these components may seem familiar to an instructor already invested in providing high-quality, active learning opportunities for their students. Indeed, as Stott and Neustaedter (2013) argue, "a good teacher already utilizes the power of game dynamics, whether they know it or not" (7). We agree, but an underlying framework can make the use of game dynamics more approachable.

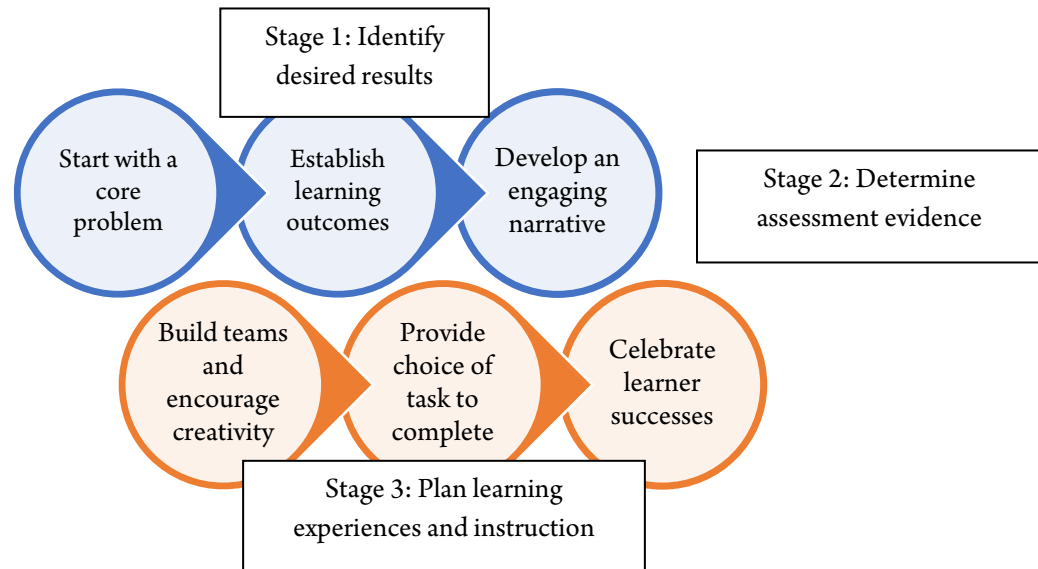**Figure 1. Game-based learning course design framework**
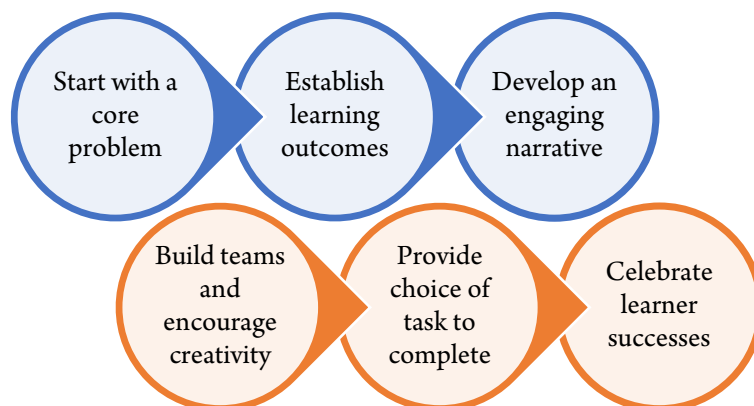
The design framework begins with a core problem, identified by the instructor, and relevant to the course. This is intended to create a meaningful connection between learner and content (van Staalduinen and de Freitas 2011). It also mirrors task-based learning approaches that begin with a task and allow the learners to decide how to approach completing the task. Afterwards, as in many respected course design frameworks (Gameful Pedagogy 2019; Wiggins and McTighe 2005), intended learning outcomes are necessary for both the instructor and learner to understand. The accompanying narrative to tie together the core problem with the learning outcomes is the crucial third step, as narratives can be seen as "an essential relationship between the learned skill and the fantasy context (engaging and educational)" (Habgood, Ainsworth, and Benford 2005, 484). These first three steps occur before the course has begun, and the remaining three guide the rest of the game-based learning experience.

In the fourth stage of the framework, learners are put into teams that persist throughout the course (Oakley et al. 2004; Whitton 2014) and then asked to embed creativity into their team's identity to further increase investment and engagement in the team's learning endeavours. Whereas many gamification endeavours ask students to design avatars, this removes the onus on the individual student to be creative and instead allows the team to collaborate and find an identity. We use the term "teams" rather than "groups" intentionally due to distinctions in the literature between teams and groups (see Oakley et al. 2004): a team being a consistent amalgamation of learners that has time to form over the entire length of the course, rather than a transient grouping of students for the express purpose of completing a singular assignment or task. The fifth step of the framework provides students choice in the tasks they complete each class so they can decide which task or deliverable is most meaningful to them (van Staalduinen and de Freitas 2011; Whitton 2014), or, in the team-based approach, which element of the task is most suitable to each team member. Finally, the framework concludes with a celebration of learner success; after the completion of each task, learners reflect on how well the team functioned and which students contributed (and how) to the success of the team. The final three steps of this framework then repeat as the course progresses.

Assessments are not explicitly detailed in this framework as there is flexibility with what the instructor of the course wants to implement. Certainly, with the majority of time spent solving problems in class, learners should complete assessments that are aligned with the inductive, task-based learning

approach. Assessments could therefore consist of evaluating team participation on a weekly basis, reflecting metacognitively, drawing connections between theory and task, creating a poster, or writing a paper, amongst other possibilities. Figure 2 maps Wiggins and McTighe's (2005) three stage backward course design framework onto the proposed game-based learning course design framework to better understand the similarities and differences.

Figure 2. Comparison of game-based learning course design framework with Wiggins and McTighe's (2005) backward course design framework

STUDY

The implementation of the game-based learning course design framework occurred in fall 2018 at the University of Waterloo, a large, public research institution in Ontario, Canada. Our project received research ethics clearance (ORE: 23218). The research team was comprised of the instructor of the course; an educational developer who worked on the design of the course and framework; and a PhD candidate who supported the data collection and analysis. The instructor of this course is an Assistant Professor who taught this course on the Black Death at her previous institution as an independent research course. Designed by the instructor herself, the first half of the previous course was conducted as a seminar with weekly discussions on assigned readings, and the second half transitioned to an independent research project with no contact hours between students.

Although the course was successful in its initial format, we were intrigued by the potential of games for learning about history. We recognized, however, that we needed more than just a game on its own. As McCall (2016) writes:

> The discipline of history is about working with varied interpretations of the past and developing a strong, evidence-based claim for what happened in the past, why, and to what effect. A historical game really should never be the only interpretation referred to in class. Rather, students should compare the

> *game's models to other sources of evidence: primary sources, secondary sources, and the teacher's instruction (535).*

We therefore endeavoured both to employ the potential of games for history education, but also to ensure interpretation opportunities were core to the educational experience. The course was redesigned as a research seminar scheduled for two consecutive contact hours per week. The third contact hour was available to students for their research. Teams of four to five students worked collaboratively on weekly learning tasks. At the end of the course, students were individually responsible for synthesizing the large amount of information gathered by their team in the writing of a final paper.

To build team rapport and align with the course narrative, the teams became Plague Hospitals, the students Plague Physicians. The ability of the team to succeed or fail along posted metrics resulted in their Hospital gaining or losing points. Metrics consisted of a mix of individually earned (e.g. an assignment submitted free of typos) and team earned (e.g. the first Hospital to have all members submit an assignment) possibilities. Importantly, student marks were calculated separately from Hospital points. The Hospital that earned the most points by the end of the course received a small prize, the nature of which remained unknown to learners until the end.

Throughout the course, game and quest terminology was employed for immersive effect. The syllabus was rewritten as a game manual and individual elements, such as assignment descriptions, were printed on a deck of playing cards for each learner. Learners named their Hospitals and selected team colours, which the instructor then fashioned into team flags. The metrics used for awarding or subtracting points existed as Potions (*positive*) and Poisons (*negative*). Each was represented by a pin with the icon of a common medieval potion or poison ingredient. When earned, these pins were attached to a Hospital's flag for display in the classroom. As a result, learners had a weekly reminder of their Hospital's status relative to others'. Throughout the course, learners were provided with choice as often as was feasible. Students had to complete a minimum number of assignments (fight a given number of monsters), however they had a list of potential assignments from which to select. Certain assignments included the possibility of re-doing them for better grades; to create learner buy-in, these monsters could "respawn," enabling players to "fight" them again.

The final core game element was a two-week-long role-playing game. Learners selected characters representing members of a town council faced with the task of avoiding the Black Death. Each role included a character sheet consisting of a biography; game objectives; win and loss conditions; and supplemental readings. Learners ran the classroom, engaging through their characters with the dilemmas, consequences, limitations, and fears concerning the Black Death that they had been reading about and researching. The role-playing game ended with a communal decision for how to keep the plague from reaching the town and a debriefing session where the gameplay and its historical value were examined.

With the above context in place, we focused our study on the following research questions:

1) *How does the game-based learning course design framework function as an approach to teaching, and which aspects of the framework resonate most with learners?*
2) *To what extent does implementing the game-based learning course design framework result in increased student engagement?*

We operationalize engagement not as a pre-existing construct, but rather solely within the confines of this class context. In effect, this means that engagement is defined as a learner's active participation in

not only class and team discussions, but also in one's willingness to go above and beyond in the course, completing additional assignments (which result in bonus contributions to the team's success), or accessing external material that is not being assessed. Kuh (2009), examining how the engagement construct has evolved over time, claims that "today engagement is the term usually used to represent constructs such as quality of effort and involvement in productive learning activities" (6), which our definition follows closely.

METHODS

Our study employed numerous tools to analyze the efficacy of the game-based learning course design framework. Using a combination of pre-/post-questionnaires, focus groups, and in-class observations, we studied the implementation of this framework and the impact it made on students, both in their own perceptions and in actual observed behaviour throughout the course. In a small class of 15 students, 14 participants provided insight into their impressions and actions in the course. Twelve agreed to have their data used for the purposes of this study. These students were all undergraduates, 11 enrolled in the Faculty of Arts, and one in the Faculty of Math. Six identified as female, and six identified as male. As the course was an elective course, students from any Faculty could enroll. Importantly, the game-based nature of the course was unknown to students when they enrolled.

The researchers designed the pre-questionnaires to understand participants' orientations towards gamification, various teaching approaches, and preconceptions as to how they learn best. These notions were revisited in the post-questionnaire to collect feedback on the game-based learning course design framework and to determine how these perceptions on the experience may have changed. Two focus groups added more extensive data, especially in detailed qualitative statements, to the information gathered from surveys. The first focus group was held partway through the course so as not to focus solely on initial perceptions. It provided valuable insight into early effects of the framework and how the participants foresaw the rest of the course developing. The final focus group held outside of class, after the class had finished but before final grades were released, further highlighted the significance of some observable trends.

During the course's progression, third-party observations of the class were conducted by the research assistant on two occasions. Monitoring the in-class behavior of students and comparing to their answers from questionnaires and focus groups allowed the research team to observe how closely their perception of learning preferences correlated to their actual performance. We employed an observation protocol in order to study what exactly occurred in the classroom. The observation protocol assessed what the instructor, teams, and individual students were doing throughout the lesson. When an interaction of note occurred, the researcher indicated the time at which it occurred and explained briefly what was observed.

The study looked for several broad themes throughout the progression of the course: motivation, especially the efficacy of an extrinsic source of motivation; engagement, including when participants were most and least engaged; the most beneficial type of learning for students; teams and how well they functioned; and gamification, including prior understanding of the term, experiences during the course, and perception upon completion of the course. After feedback from the first focus group, we began to look for issues of clarity or confusion related to the course or to gamification in general.

The pre-/post-questionnaires, focus groups, and classroom observations were all coded by the research assistant and reviewed for consistency by the research team. The research assistant transcribed all focus group data and coded the results from all sources of student data and observation. The following six codes emerged through an open coding process (Strauss and Corbin 1990): motivation, engagement, learning type, teams, gamification, and confusion. Within these six codes are generated sub-codes, as seen in table 2. These broadly defined but flexible codes were checked by the other researchers for consistency and then analyzed for continuity and change across each data point. These codes, their meaning, and evidence from the learners to support these codes, will be expanded upon in the results section.

Table 1. Coding of participant data

Primary code	Sub-code
Motivation	Extrinsic
	Most motivated
	Least motivated
Engagement	Most engaged
	Least engaged
Learning Type	Most beneficial
Teams	
Gamification	Experience
Confusion	Assignments
	Format/schedule
	Prizes/reward
	Names/symbols
	Group work
	Historical context

RESULTS

Participants predominately entered the course with preconceived notions of course structure expectations. Eighty percent of students in the pre-questionnaire said they chose the course because they found the topic or the time period interesting, and 20 percent because they needed a credit that fit their schedule. Due to the course not being advertised as being gamified, the format of the course did not influence the students' decision to enroll in the course. Upon learning of the game-based nature of the course, they reacted neither positively or negatively, but were interested overall in the concept, and with only a couple of exceptions, had no prior experience or even a clear idea what the term meant. By the end of the semester, however, all respondents in both focus groups and the exit questionnaire ranked the role-playing game during the last two weeks of class as the most engaging part of the course. Universally, students stated that they would have liked even more game-based learning of that nature. Qualitative responses, especially in the focus groups, highlighted several key strengths of the role-playing game, such as the clear objectives and rules, the chance to compete and engage with their peers, and that it felt the most "like a game." Even more significantly, they expressed strong interest in "putting themselves in the shoes" of the past people. They also stated that the historical empathy this encouraged helped them

understand the content and find other areas of research to pursue beyond the class. Participants expressed noticeably less confusion about gamification as the course progressed.

In the pre-questionnaire, students indicated that they held ideas about the benefits of certain learning preferences, but results from the observations and post-questionnaire demonstrate changes between those opinions and actual participation in the class. When asked about what teaching approaches they believe are most helpful for their learning—not just in this history course, but in their entire higher education experience—students consistently ranked their preferences highly in favour of lectures and negatively toward group work. Ninety percent of students in the pre-questionnaire selected lectures as the most, or among the most, helpful type of learning for them, and group work as the least helpful (table 3). Quantitatively, especially when asked to rate learning preferences on a scale, this showed little change over time; the students overwhelmingly claimed that they prefer a lecture-style classroom. In-class observations, however, showed that even though students seemed consistently engaged by the material, within 10 minutes the majority had stopped taking detailed notes. In this case, the students indicated their belief in how they wanted a classroom to function, regardless of their actual performance in such an environment. Students overwhelmingly and consistently ranked a "groupwork-like" presentation on their sources as the least engaging part of the course. Furthermore, in the first focus group, when asked about progress in the course, students stated that they did not plan to pursue bonus assignments, or "side-quests," as they did not feel they would have time to coordinate with their peers. They generally felt the teams functioned well but were of limited utility.

Table 2. Percentage of students who found certain teaching approaches helpful in pre-questionnaire

	Extremely helpful	Very helpful	Somewhat helpful	Not so helpful	Not at all helpful
Lectures	89%	11%	0%	0%	0%
Large class discussions	45%	22%	22%	11%	0%
Small group discussions	33%	45%	22%	0%	0%
Group work	22%	11%	11%	45%	11%
Individual work	33%	33%	33%	0%	0%
Demonstrations	56%	22%	22%	0%	0%
Technology enabled learning	44%	12%	22%	22%	0%

In the final focus group and post-questionnaire, after team dynamics had developed and prizes were awarded, students showed a more favourable view. They stated that their teams motivated them, helped them research sources, and provided inspiration to succeed against other teams. Desire to win and support their team meant that, at least among teams closely competing for the prize, multiple students completed "side-quests," and at the end of the course many expressed that they wished there could have been more teamwork.

The study shows preliminary evidence for variation in participant responses when asked about "group work" versus how their "teams" functioned. We posit that the actual, or at least implied, difference in structure fostered improved cooperation along with a sense of independence and choice. Oakley, Felder, Brent, and Elhajj (2004) note that "a group of students coming together to work on an assignment is not the same thing as a well-functioning team" (13), and describe multiple distinctions

between groups and teams, suggesting that teams work on long-term projects that require significant time and effort.

The students valued teamwork highly because they could work independently toward a shared goal. The elements of a gamified course, including interpersonal competition, extrinsic motivation, and cooperative goal-oriented tasks, allow for opportunities to explore these sorts of team dynamics and student engagement. As a student in the last focus group expressed: "We got closer as a team and worked together more… Individually we got better but that was also because we didn't want to let our team down." Therefore, we argue that although students may still view this type of work as "group work," the intrinsic value of such work emerges when probed and their interaction in the class is observed.

Comparatively, students found they were least engaged when presenting their team's information to other teams, or in turn, when they were listening to other teams share their research findings. These are decidedly less gamified elements and, in turn, may have appeared as rote and not as meaningful to the success of their own team.

DISCUSSION

We return now to the four core elements of the game-based learning course design framework – narrative assignment design, choice through quests, learner discovery, and team-based collaboration and competition. Much of the participant feedback and our own observations connect to these core elements to help explain their relevance to the game-based learning course design framework.

Narrative assignment design

As the overarching narrative of students as members of a Plague Hospital was embedded throughout the entirety of the course, students referenced it frequently as a compelling course component. Of all the elements of the course, the role-playing game was cited as the most engaging aspect due to its combination of historical narrative with immersive role play. Interestingly, many learners discussed how the gamified elements blended as the course progressed; indeed, when operating well, what makes the game-based learning course design framework "gamified" becomes less noticeable (Stott and Neustaedter 2013). We believe that these gamified attributes lend to the engagement of the course without distracting from the intended learning. Students noted this as well. During the first focus group, when speaking of playing the mini-game within the course, one student claimed: "And I feel like there was, for me at least, there was some sort of reward you could get. It was not real, but if you got your objective it felt good," to which a second student responded, "Oh it definitely felt good. Felt like you won the game." Jabbar and Felicia (2015) suggest that games like this with an immersive narrative "are considered to support and improve engagement and learning, and role-play serves as a major source of immersion in [game-based learning]" (763).

Of the codes that emerged in our analysis of the student responses, confusion frequently surfaced, though the learner's state of confusion was never asked explicitly in any of the data collection practices. The assignments in the course, the format/schedule, and the names of creatures in the monster guide were all cited as causing initial confusion. One must consider the balance between immersive narrative and its potential to mask the intended learning outcomes of the course. In this instance, however, the instructor crafted a separate course outline that functioned like a traditional syllabus with all assignments and tasks laid out in standard academic nomenclature. It is also imperative to note that confusion declined substantially between focus groups and during the post-questionnaire.

One student in the post-questionnaire said they were least engaged "early on when it was most confusing… that confusion was quickly replaced by the fun of the course structure."

In many ways, the narrative of the course and the accompanying assignments sustained engagement for most students, even when confusion inevitably spawned as students were introduced to the gamified structure of the course.

Learner discovery

Students engaged with activities that promoted learner discovery on a routine basis. As early as the fourth week of class, students were accustomed to the course routine by quickly transitioning into their teams and discussing what they read for class. Team presentations allowed another opportunity for learners to explain what they discovered, rather than await the instructor's interpretation, but some students found them to be the least engaging part of the course. Despite early observations that students sat attentively and took notes, the observer noticed less engagement when students listened to multiple presentations in a row. As the course progressed, students' impressions of the course's design and the relevance of learner discovery changed. As one student expressed:

The structure of the class in terms of the amount of research required and the in-class minigame helps to give students more opportunities to hone their research skills and apply lecture concepts in an interesting and memorable way.

Learner discovery can indeed encourage engagement and foster a deeper commitment to learning. It needs to be a strong, consistent focus of the course environment, however, to remedy any initial confusion that may stem from the game-based learning course design framework. Unsurprisingly, being confronted with an unconventional teaching and learning paradigm resulted in early trepidation. Forming teams and solving historical "problems" with no set solution may have been seen as contrary to expectations for a history course, and, as some expressed, students believed they learned best through lectures, not activities. As with many innovative teaching approaches, however, learners often require sufficient time to become accustomed to a new learning paradigm. Therefore, it is integral not to sway from the gamified course direction and revert to traditional teaching approaches. As one learner explained with this approach to the course: "You study things you wouldn't think to study sometimes, about everyday lives. It's not something I read about often in history."

Team-based collaboration and competition

Some of the most surprising results emerged when learners discussed the utility of the team-based nature of this gamified course. Initially, many students expressed reservation or outright disdain for group work (see table 3). Even in the post-questionnaire, when students were asked which course aspects were most beneficial for learning, teamwork and team building were considered less beneficial in comparison to the course content or the lectures themselves. And yet, as the term progressed, many viewed team-based collaboration as the hallmark of the course when asked in the focus groups. One student expressed that although the course felt less gamified as the term progressed, they wished there was an even stronger emphasis on team collaboration. Another, when asked what aspect of the course they would change given the chance, expressed a desire for more team-based games. Jabbar and Felicia

(2015) note too that both collaboration and competition can engage learners in games, but recommend that collaboration is likely better than competition due to the socializing aspect.

The benefits of collaboration extend beyond completing work. During both course observations, before the class had begun, students were good-natured and laughing with one another, sitting with their fellow team members, and appeared genuinely interested in being present. This persisted even throughout the final observation in the penultimate week of the course, suggesting, from a community building perspective, that the teams had benefitted from working together throughout the length of the term. As one student expressed in the final focus group, they would have liked even more activity in teams, emphasizing that the team meshed better, bonded, and worked more effectively as the term progressed.

Interestingly, the extrinsic rewards for successful team collaboration were not as motivating as expected. The winning team received a Black Death microbe plushie, but members expressed that it had no real bearing on their intention to succeed as a team. One student explained that:

> *The prize was good for what it is… I like the prize but I could see people being more incentivized… if they kinda knew that the prize affected the course. Even something simple like taking out the lowest assignment."*

Another student admitted,

> *I enjoy coming to class all the time. I personally think an hour lecture would be nice just to have on top of the two-hour game. And then I feel like a reward should be easier or more instant gratification. People play games for that reward.*

In both cases, although the course itself remained intriguing and worthwhile in the eyes of the students, a more tangible reward would have evidently further engaged the learners and been more akin to a game.

Team-based collaboration and inter-team competition provide a strong motivational basis for engagement in the gamified course. When that motivation is nurtured and accompanied by the overarching narrative, learners find a heightened sense of belonging and willingness to exceed expectations to help their team succeed.

Choice through quests

The side-quests that were introduced into the course—optional assignments that students could choose to complete in order to gain more points for their team—proved inconclusive in terms of engagement generated. For some students, the side-quests were intriguing and provoked a level of excitement and motivation to complete them. Six of the 12 students participating in this study elected to complete at least one additional side-quest, suggesting that the game itself, and the integrated team-based competition, promoted the completion of ungraded activities. One student expressed:

> *Well, once I knew we had a chance at winning (we had like a 30-point deficit before the last wave of assignments), I really wanted to win the prize so I did a side-quest to win. I did not know what the*

prize was, but I just knew I wanted, in case it was something like "you get to drop your lowest assignment."

For students such as this, side-quests were another advancement method in the course, with a sufficiently engaging (albeit ambiguous) incentive to participate. For others, however, the incentive for completing these quests could have been more enticing.

This highlights the need to consider thoughtfully how to incentivize gamified learning processes that are not assessed. Although the team-based nature of the game-based learning course design framework evidently worked well and engaged students throughout, the side-quests were less effective due to the ambiguous nature of the reward. The success of the team alone—while useful for some participants—was not motivating enough for others. An idea that some students proposed—to "opt out" of an assignment should they complete enough side-quests—is one worth considering in the future. If an instructor can reasonably determine that a student has met an intended learning outcome by completing side-quests, perhaps the student could opt-out of an assessment, thereby making the side-quests themselves more rewarding and further promoting learner choice.

CONCLUSION

We recognize the limitations of a study with the number of students who provided feedback (n = 12), as well as the results coming from a single institution. In the future, we hope to see this game-based learning course design framework applied to other contexts within various disciplines of different class sizes. It remains our belief that this framework is scalable to a class of any size, and applicable to any discipline, depending on resource and logistical support. This may present an unrealistic challenge to some instructors or institutions, but the framework is intended to be widely adaptable.

At this point, we return to our initial research questions. First, our question "*How does the game-based learning course design framework function as an approach to teaching, and which aspects of the framework resonate most with learners?*" is understood through the various student responses that underscore that learning *did* indeed occur, and students were primarily encouraged through the teamwork and the engaging narrative to draw them into the course, particularly with the mini-game. The second question, "*To what extent does implementing the game-based learning course design framework result in increased student engagement?*", presents a starting point for discussion, but the answer remains unclear. For some, certainly engagement was increased as they saw the benefit of team-based collaboration and competition as motivation to complete additional work. Other students, however, were unphased by elements of the game-based learning course design framework, such as the inclusion of side-quests, and required additional incentivization to complete them. Therefore, we need to consider whether game-based learning alone can be sufficient to engage all learners, or if we will be reliant on alternative forms of incentivization (such as explicit assessment) to benefit all learners.

Game-based learning need not be conceptualized as merely the adaptation of pre-existing "gameful" principles. While there is certainly utility in these tools—their prominence in higher education over the past decade is evidence as such—there is perhaps greater feasibility in incorporating the game-based learning course design framework as it necessitates neither in-depth knowledge of gaming conventions nor requires inauthentic application of game principles. Rather, the game-based learning course design framework relies on existing, effective teaching approaches such as task-based

learning, combined with the affordances of gameful principles like a compelling narrative and player/learner agency, all positioned within a collaborative team environment to improve and propel learner engagement.

ACKNOWLEDGMENTS

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