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Making Design Activities Gameful Using a Role-Playing Card Game

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Abstract

This paper presents our attempt at making a master's level course on Digital Game-Based Learning (DGBL) gameful. The students were expected to propose design concepts for educational games at the end of the course while collaborating in groups. In our effort to make the design activities gameful, we created a role-playing card game for designing DGBL, which challenged the players to use various learning and design principles. Adopting Holden and colleagues' (2014) conceptualization of gamefulness, we observed that learners showed a lusory attitude in designing DGBL when playing this card game. In this paper, we discuss our design of the course and the role-playing card game. We also argue that engaging in such a card game supports learners' gameful learning based on preliminary findings from using the game in the classroom.

Introduction

Educators are increasingly attempting to incorporate games and game dynamics for student motivation and performance at various levels of education (Johnson et al., 2014; Sheldon, 2011). The approach of changing classroom dynamics similar to that of games is often called gamification, which uses game design elements within a non-game context. Within educational contexts, it could be the productive interaction generated through simple game play for learners and educators (Rughinis, 2013; Leech et al., 2014). Gamification has gained popularity in higher education specifically in science and engineering-based disciplines (e.g., Barata et al., 2013). In the field of Education, there have been consistent efforts to make the courses on game-based learning more game-like by the instructors of in-service and pre-service teachers (e.g., Fishman & Aguilar, 2012). These efforts found that game scoring mechanics mapped to course assessment does not necessarily engage students (Fishman & Aguilar, 2012; Sheldon, 2011). We concur that an assessment-focused gamification of a course may not promote students' gameful engagement. Hence we focused on how course activities could be more gameful. The term 'gameful' was used by McGonigal (2011) to emphasize goal-driven and serious efforts in gameplay. Recent research on university course designs with gameful grading systems revealed that students not only perceived the grading system positively but it made them work harder and feel more control over their learning (Aguilar, Holman & Fishman, 2014).

As facilitators and researchers of a master's level course on Digital Game-Based Learning (DGBL) at

a Western Canadian university, we advocate engaging pre-service and in-service teachers in gameful learning activities (Kim, 2015). The course used game concepts and dynamics (e.g., experience points and multiple battles) (Sheldon, 2011), while exploring various forms of games, and their design and learning principles for their potential use for classrooms (Kim, 2014, 2015; Kim, Gupta, & Clyde, 2015). Building on the gameful experience framework proposed by Holden and colleagues (2014), we explicitly communicated with students that being gameful was an important element of the course. Considering how card-based games as a pedagogy foster collaborative learning and essential 21st century thinking skills (Reese & Wells, 2007), we incorporated a role-playing card game to support students' design of a DGBL environment. Gressick & Langston (2015) similarly designed and implemented card games to scaffold student recognition of fallacies in thinking and avoiding them through social negotiation. Our role-playing card game was designed to play in groups of 3-5 students where each player drew from a selection of cards from three categories – disciplinary, interdisciplinary, and multidisciplinary that determined their expertise in approaches, and encouraged collaboration on a game design using sound principles. In the following, we briefly discuss the multiple iterations of the course and our approach to gameful participation, including the role-playing card game. We then present the preliminary findings from using the game in the classroom.

Gamefulness in the Classroom

Players or learners who are gameful make efforts to understand the rules or constraints to accomplish game goals, negotiate their identities within and around the game, and cultivate curiosity and inquiry to overcome their ignorance (Holden et al., 2014; Kim, 2015; Salen, 2011). These three dynamic elements, namely 'lusory attitude' (Suits, 2005), identity, and ignorance, help experience gamefulness (Holden et al, 2014). The gameful experience through these dynamic elements also supports learners' cognitive, social, and emotional engagement in learning. Cognitively, players engaged in non-linear repetitive tasks, progressively discover overt or hidden game rules and gain expertise in both the content and rules of the game (Domínguez et al., 2013; Lee & Hammer, 2011). This requires them to cognitively identify their area of ignorance and actively seek solutions. In this process, they project and conceptualize multiple identities that are pertinent to the game as well as their social worlds beyond the game environment (Holden et al, 2014). The players' lusory attitude of addressing these challenges is socially stimulated, especially when players identify varying expertise (i.e., identities) as well as weaknesses while seeking solutions (i.e., ignorance) within the collaborative game settings. Similarly, gameful engagement accompanies and is intensified by a range of emotions. Emotions, from curiosity to frustration to joy, can be powerful source for deeper engagement (Kim & Kim, 2010; Lazzaro, 2004). Mild frustration for failing a seemingly achievable goal, joy of figuring out a solution with co-players, and curiosity toward what solutions competing players may come up with are some of the examples that could motivate players for deeper engagement. The design activities of a game or a course can support gameful learning, but these dynamic elements come into play when learners start interacting with the design. In this section, we discuss the design of course activities that may support learners' gameful engagement.

Supporting gameful participation

Every activity in a two-week summer intensive course on DGBL was positioned as meaningful experience, and participants could score experience points (XP) every day (for more details, see Kim,

2014). The instructor conducted this course for three years (2013, 2014, 2015), in which students participated in online (Google+) and in-class conversations and activities. There were a number of changes in subsequent iterations. For example, after receiving varying reactions to the leaderboard of XP in 2013, we started having participants create avatars for Google+ community for anonymity in their online activities and XP for the leaderboard (Kim, Gupta, & Clyde, 2015). This also reframed online conversations as a gaming experience (McGonigal, 2015; Ramirez & Squire, 2015). Students tried to figure out their peers and to hide their identities at the beginning but became less concerned about avatars and anonymity as the course progressed and they were more focused on their group work. Some students expressed their concerns during the second iteration over posting on Google+ during class time instead of participating in discussions. Hence the third iteration focused on exploring gameful participation during the class discussions and group design in addition to improving various existing elements of the course. For XP, "Gameful Participation" was introduced to put more emphasis on in-class activities with the guidelines in Table 1.

	Full Experience Points	Warning
Gamefulness	You will be rewarded by being fully immersed into the new rules of this course and contributing to everyone's (including facilitators) learning experience.	Engaging in other activities, such as checking your emails or social media, would distract you from being fully immersed. Tweeting or microblogging on social media, including our Google+ community, may help you only when the content is immediately relevant to the on-going activities/topics.
On-going leadership	Your leadership can be in many different forms and are essential for our learning. Share your expertise as teachers, gamers, designers, parents, experienced learners, etc. with us!	Having no voice or dominating the conversation may not give you the full experience of the class. Asking good questions to those who have different expertise will also give you a better learning experience.
Contribution to the guild	Contributing productively to your guild is also the process of finding and developing expertise. Exercise distributed leadership within your guild.	Again, simply following or dominating your guild's decisions may not give you the full experience of the collaboration.

Table 1: Guidelines for Gameful Participation XP

Gamefulness as the first guideline encourages lusory attitude. On-going leadership part of the guideline emphasizes developing their existing and other multiple identities. The third guideline, Contribution to the guild, focuses on the ignorance element by encouraging their development and identification of varying expertise of the group (i.e., guild) members. All three guidelines draw attention to their social and cognitive influence on other participants.

Students' gameful participation was put into test from the first day of the class. At the beginning of the class, the students had to play an icebreaker game by preparing clues (i.e., questions and drawings) about themselves based on how they wanted to introduce themselves in class. Out of the seven students, one team comprised of four students and another the remaining three. Each team received the opponents' clues (2 or 3 items, 8 total for each team), shuffled and drew them, and guess who the clues referred to. One group appeared more competitive based on their difficult questions. This gameplay led to a display of lusory attitude as the students engaged in conversations on why games are engaging,

the value of games, how games draw people together and help with problem solving. The students' multiple identities began to emerge as their clues highlighted not only their personal experiences (e.g., their hobbies, family) but also their relevant experiences such as expertise at gaming, exposure to digital games, experience at using games in their classrooms. Starting with this game, sparked students' identification of their areas of ignorance as they began taking a deeper interest in the types of games they would play for the course, while familiarizing themselves with game terms such as "battles", "avatars" and how that would play out in the course.

Making design activities more gameful

This course used the concept of game "battles" for different levels of tasks and their goals (Sheldon, 2011; Fishman et al., 2012), especially for their DGBL design project. In digital games, a boss battle is the most challenging part at the end of a level, which would require players to use varying skills and knowledge (about the enemies) they acquired. In this course, students needed to fight three battles, including forming and introducing the teams, sharing on the project with in-class playable components, and producing the DGBL project document. In the course of completing first two battles, students shared parts of their prototypes on Google+ and received feedback from other students and the instructor. To make their preparation for the final battle a more gameful effort, we created a role-playing card game for the group's DGBL design activity. The goal was to design and pitch a game with sound learning and design principles while developing their design expertise. We would like to highlight three main features of this card game: game content, role-play, and progression.

Figure 1: A Deck of Cards

Game content

The students were given a deck of cards with key design principles for DGBL (See, Figure 1), drawn from the previous course discussions on readings. They were categorized as Game Structure, Learning Principles, Game-Based Learning, and Game Aesthetics. Categories were written on the card, and also

indicated by different colours. They started this game during the second week (Day 6, 13th of July) of the course, so they played it with their preliminary game ideas from the first five days. The players were expected to use the cards to elaborate upon the design principles for their game design. Each card had assigned points (1 to 9), considering its expected complexity of addressing them. They were also required to fill out scoring sheets, with which they could record the evidence of using design principles (i.e., describing relevant existing or modified design). The competitions were implicit in the game in varying levels, including developing their personal design expertise, better addressing design principles (within and across groups), and creating more sound educational game designs (between groups). Both their scores and design products represented their achievements.

Role-play

Based on the four categories of design principle cards, each player was asked to take on a disciplinary, interdisciplinary or multidisciplinary expert role, by focusing on one, two, or more than two categories. This was an opportunity for participants to think about their own design expertise, and at the same time, to strategize how they could productively design together, rationalize their design choices, and score better for the game. The participants were provided with character sheets to record their individual information about their roles.

Progression

Students played this game and with their game designs for three days. The progression for three days was for both game content and role-play. On the first day (Day 6, 13th of July), students received the first three categories, as they were relevant to the readings and activities from the first week. To focus on understanding the cards and initial gameplay, they took turns with different cards without assigning any role. On the second day (Day 7, 14th of July), the fourth (Game Aesthetics) category was added as it was relevant to the readings and activities of the day, and students were introduced to the three expert roles. On the last day of the role-playing card game (Day 8, 15th of July), they had a chance to create their own cards (up to 15 points within 2-3 cards) for the categories they chose. They could also change their roles with the new cards. Through this structured progression, students were expected to increase the complexity in their game design and the way they played this card game.

Preliminary Findings

For their design activities or multiple battles, they formed two groups. They named their teams with their game titles, *The Castaways* (CA) and *The Sorcerer's Apprentices* (SA). We observed that using the role-playing card game was effective in students' deeper appreciation for DGBL literature and relevant design principles and gameful engagement in their design of DGBL for both groups. CA team consisted of three female teachers of Western Canadian schools whereas SA team had two female and two male teachers with diverse teaching assignments across the world.

Lusory attitude toward playing and designing

The CAs decided to design a science game for elementary students (Grade 2) involving concepts from boats and buoyancy (see Figure 2a). They decided that their students would learn this content well through experimentation in the game. From our observation, the CA members carefully followed the game rules, including taking turns to read the card and identify the evidence of using the principle in their game, and deciding if each of them scored the assigned XP in each card. In the effort of better playing this card game and finding their design evidence, they chose fewer cards but of higher point values. On Day 6, this group also chose to incorporate features from games played or observed during the class. While discussing game structure (Navigation and Clues), the group decided that the AI or the monkey provides instructions when the players are unable to progress, similar to what they experienced during their game play of *Portal*. In discussing the principle of Immediate Feedback, they focused on incorporating the feedback into the narrative, that is, boats will not make it to the next island if not built or repaired properly. On Day 7, their discussion on the principles was centered on better incorporating the content into gameplay. For example, when they discussed problem solving (game-based learning category), they delved into how AI can offer hints at the beginning to better explain what the players have to do. Similarly for sense of agency or ownership (game-based learning), they discussed how the creation of avatars and the opportunity to assemble their own boats would work well with elementary students. The lusory attitude was therefore visible in their effort to incorporate major learning principles while interpreting and following the rules of the card game.

The SA members, on the other hand, loosely followed the rules by having conversations on the design principles in each card regardless of their turns. They designed a game for English language learners and focused on improving the game mechanics. They used ten principles focusing on conveying “meaning” by players using vocabularies within the game. The overall design was to generate various pictorial mazes (see Figure 2b) within the game either through levels or through failure states. Another example is from their discussion on how learners relate to facts and their associated themes while comprehending a narrative on Day 6. They created an overall narrative of collecting and delivering items to the sorcerer, in order to create potions to defeat attacking poisonous creatures. After examining the design principle of themes and narratives, they decided that each level would have a thematic collection of vocabularies. The narrative would evolve with the elements of non-player characters, setting, rising complication, climax and resolution. These characters came in the form of poisonous creatures and at the initial levels the setting involved easy mazes with easily achievable goals. Similarly in order to retain the interest of the players as new language learners they worked on how to make failures interesting on Day 8. They discussed various design choices for the failures (i.e., wrong match between a word and an object) in the game, such as a more complex maze with creatures of stronger poison or faster speed, the changing colour of the wizard (darker and darker) or sudden appearance of enemies who they would have to fight. By going through each principle card, they had an opportunity to be much more critically about their design of the game. Even though they were less careful in following the rule of the card game, they showed lusory attitude towards understanding how game design relates to creating engaging learning experience.

a: CA, The Second Island Challenge

b: SA, Game Level 2

Figure 2. Sample mock screens of two groups' game designs.

Group members' identities

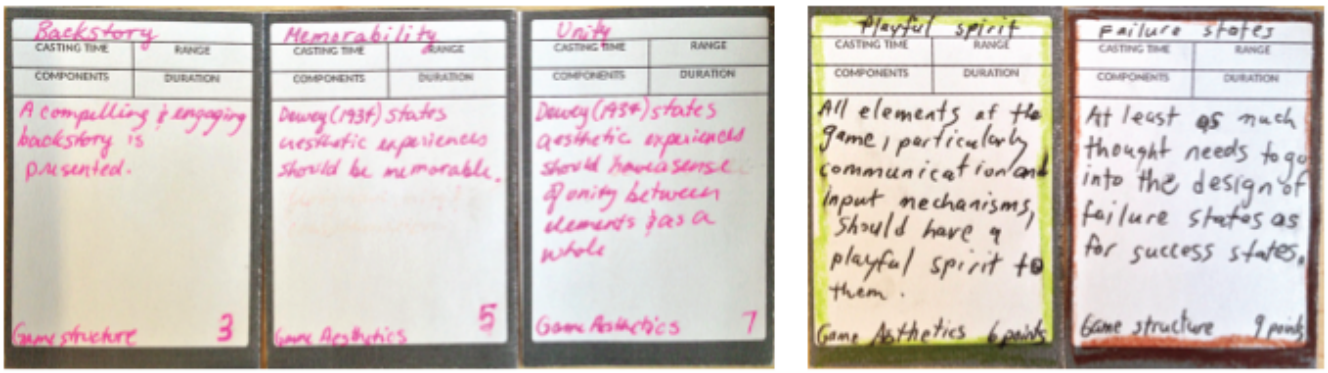
During this card game play, it was apparent that each one of them contributed based on their ideas and experience of playing games, and working with children on particular subject areas. In CA group, one member was viewed as a content expert whereas other members emerged as a leader and supporter of the project, according to their reflection papers. As elementary teachers, they showed their understanding of how children would prefer dealing with avatars such as "the monkey" asking players to work in teams or even inducing creativity battles in the game where the children would have fun decorating and naming their boats. As mentioned above, it was clear that CA group members carefully follow new rules presented. For example, on the second day (Day 7), each of them took on disciplinary, interdisciplinary, or multidisciplinary role as our example showed three facilitators taking on one of them without overlapping. It was unclear from this preliminary analysis that they were choosing cards based on their existing area of expertise.

In SA group, there were three teachers working in Asia and the Middle East and based on some of their design ideas it appears that they took cultural perspectives of their contexts into consideration. For example, they thought of including a sense of urgency and stress to relate to real world problems of not understanding a foreign language within the DGBL principles such as rewards, motivation, or sense of urgency and ownership. On Day 7, they made provisions for players to notice that their vocabulary is increasing through the Learning and Identity card. Of those who chose the Learning and Identity card one is a science teacher in the Middle East and hence took on the role of an interdisciplinary expert focusing on knowledge being transferable, active, and critical and players progressing through rewards and levels. Again, with game mechanics principles such as Focusing Attention & Balance, they specified how the magic balls added time pressure or the timer gave points that created stress for language learners since the learners already had to deal with more words and more enemies at each level. We also found that one of the members took on the role of technology design and gaming expert based on her experience as a *Minecraft* player. She chose to be a disciplinary expert on "game aesthetics" and contributed to the design conception of monsters and zombies attacking the players while learning language, as seen in Minecraft adventure or survival mode. Thus the collaboration became evident

through the way each participant thought through the game design utilizing the principles from the cards and infusing their own experience garnered through various identities.

Identifying areas of ignorance

Both groups showed their curiosity or ignorance through their game designing activity. CA group made multiple changes to their game design throughout the three days of the role-playing card game to improve their game. On Day 8, students created new principle cards for their games. These cards may indicate their identification of what was lacking in their games. Their discussion centred on what principles to add so that they could score on what they were able to improve upon during these three days. CA members created a card on Game Stucture about Backstory, which reads, 'A compelling & engaging backstory is presented' with 3 points. They created two cards on Game Aesthetics based on Dewey's (1934) account on aesthetic experiences. They initially assigned 5 points to all three cards, but upon further critical examination realized how it was a challenge for them to address Unity in their game design and how backstory was not as a complex principle. They finally decided to give Unity principle 7 points and Backstory 3 points (See Figure 3a).



a: Three Cards by CA **b:** Two Cards by SA

Figure 3. New cards created by two groups on the last day.

SA group, who were designing a language learning game started to identify literature on language learning to better rationalize their game design as they examined their game much more deeply by playing this card game. They realized after an in-depth discussion how their game could not fulfil many of the principles in the cards without completely changing its design. They came up with the notion of embedding a "Playful Spirit" in all elements of the game and especially in communication and input mechanisms. And this playful spirit was reflected in their consistency with retaining interest in the game because they were aware how vocabulary mastery games placed lower in the order of Bloom's taxonomy could be monotonous experiences. They categorized it under Game Aesthetics and assigned the card 6 points. Similarly they felt that there need specific design elements to incorporate failure in order to motivate the players to attain success. They categorized this card under Game Structure and assigned it 9 points. This also exemplifies how they were trying to contextualize and add to the game design principles in a broader context to make the design more relevant from a gamer's perspective. Both groups' work indicates their engagement in critical inquiry that challenged the relevance of creating educational games for present day learners.

Conclusion

The earlier iterations of the course had identified the need for more playable in-class activities. Hence this third iteration was designed to accommodate in-class design activities through a role playing card game, which would facilitate learning through play. The role-playing card game itself utilized most of the design principles of DGBL in the cards, which forged stronger alignments between course activities and game design principles thereby making the in-class activities more playable. The assignment or choice of cards by the players also allowed for meaningful roles highlighting collaboration and multidisciplinary work towards the gamefulness of the players. Although it was not clearly visible through course activities, their gameful participation was encouraged as XP were granted based on on-going leadership and contribution to the guild. Students self-assessed their XP throughout the course. This helped bring out their identities, their interests and their expertise, which added to their gamefulness. It also became easy to determine the lusory attitudes that emerged from players' voluntary and focused attempts to play with academic content of the course in relation to their identities as educators and emergent identities as designers (Holden et al, 2014). The lusory attitudes towards playing the card game also helped understand their need to question the articles or principles they were learning in relation to the games they played in class taking into account their relative experience at playing digital games. The inquiries covered a wide range of topics on the connections between game design and digital game-based learning and learning in general. This helped measure their gameful learning from the curiosity or ignorance (Holden et al. 2014) that they generated during their discussions or class debriefs. Since the classroom was also a place the learners could explore and take risks with low real-world consequences it helped us to comprehend their multiple identities – real world, virtual and projective identities that fostered new ways of thinking about themselves, their potential and their social relations (Holden et al. 2014).

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