

The Game Design “Game”: Engaging in Gameful Learning Through Goal-Driven Design Discourse

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<ABSTRACT>

In this paper, we present how a card game influenced a design discourse and learning of graduate students. In a graduate course on digital game-based learning at a Canadian university, students were asked to propose design concepts for educational games at the end of the course while collaborating in groups. In order to make the design process more gameful, we created a role-playing card game, which challenged the players to use various learning and design principles. The purpose of this design-based research was to examine how the card game play may facilitate the participants’ deeper design discourse in a gameful manner. With ethnographic data, we illustrate how the content and rules of the role-playing card game supported students’ goal-driven design discourse and their engagement in gameful learning.

Key words : Gameful learning, Higher education, Design-based learning, Card game

Introduction

We are constantly witnessing attempts to motivate student engagement using games and game dynamics at various levels of education (Sheldon, 2011; Rughinis, 2013; Leech, Laur, Bebbington, Code & Broome, 2014). Despite the motivating aspects of games (e.g., immediate feedback, situated meaning, modeling system) (Gee, 2008), we concur with concerns that adopting game mechanics centered on extrinsic rewards (e.g., scores or badges) to learning activities may not engage learners in intellectually

deep learning (e.g., Hanus & Fox, 2015). In our work, we focus on course activities where gamefulness would be emphasized through goal-driven efforts (McGonigal, 2011). McGonigal (2014), in defining the term “gameful”, emphasized how it draws attention to the positive quality of gamers (e.g., seeking challenges, overcoming obstacles) and brings forth their strengths and virtues in tackling real world challenges. This quality transcends their game play and becomes part of their identity or who they are. As facilitators of a master’s level course on Digital Game-Based Learning (DGBL) at a

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Canadian university, we, therefore, advocate engaging pre-service and in-service teachers in gameful learning activities. As gameful learners, educators and designers, they would be able to tackle complex issues in education in addition to experiencing and understanding the gaming context of their learners (Kim, 2015; McGonigal, 2014).

The course explored various forms of games, and their design and learning principles for possible classroom use (Kim, 2014, 2015; Kim, Gupta, & Clyde, 2015). Considering the potential of card-game-based pedagogy to foster collaborative learning and critical thinking (Reese & Wells, 2007), we designed a role-playing card game to support graduate students' design process of a DGBL environment. Gressick and Langston (2015) similarly used card games to help students examine their thinking through social negotiation. Our card game was designed for groups of 3-5 students where each player drew from a selection of cards to examine the soundness of their design ideas while collaborating on a game design. The purpose of this paper is to examine their goal-driven game design discourse facilitated by the card game they were playing and to understand how the content and rules of this card game supported their gameful learning.

Gameful Learning

Game players usually make efforts to understand the rules or constraints of a game to accomplish its goal, seek to become a confident player or co-player, and examine their strategies (Kim, 2015; Holden et al., 2014). Researchers suggested that, when playing good games, players show gamefulness through 'lusory

attitude' (Suits, 2005) toward unnecessary obstacles, identity exploration, and pursuit for improvement and progression (Holden et al, 2014; McGonigal, 2011, 2014). The gameful experience supports learners' cognitive, social, and emotional engagement in learning. Cognitively, players engaged in non-linear but 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). Such game play requires them to identify their area of improvement and actively seek solutions toward their goals. In this process, they project and conceptualize multiple explicit and implicit social identities that are pertinent to the game as well as their social worlds beyond the game environment (Holden et al, 2014; McGonigal, 2011). The players' lusory attitude of addressing these challenges is socially stimulated, especially when seeking solutions 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 sources for deeper engagement (Kim & Kim, 2010; Lazzaro, 2004). Mild frustration over failing a seemingly achievable goal, joy of figuring out a solution and curiosity towards competitors' solutions are some examples that could motivate deeper engagement. In the following, we briefly discuss the context for the role-playing card game, highlighting how it was played in the DGBL course for their design task.

Study Context

The study discussed in this paper is a part of iterative investigations on the design of a two-week intensive summer course on DGBL for Master of Education students through

design-based research. The course had seven students with a range of teaching experience in Canada and other parts of the world. Conducting reflective inquiry into innovative learning environments in naturalistic settings (Brown, 1992; Collins, Joseph, & Bielaczyc, 2004), we designed the course to support learner's gameful engagement. The design activities of a game or a course can support gameful learning, but above dynamics come into play when learners start interacting with the design. Every activity in the course was positioned as meaningful, and participants could score experience points (XP) every day for various activities (Kim, 2014). The instructor conducted this course for three years, in which students participated in online (Google+) and in-class conversations and activities. There were a number of changes in each iteration. For example, after receiving varying reactions to the leaderboard, 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 reframed online conversations as a gaming experience (McGonigal, 2014; Ramirez & Squire, 2014). Students tried to figure out or hide their identities at the beginning, but as the course progressed they were more concerned about their design work and less so about anonymity. During the second iteration, some students expressed their concerns over posting on Google+ during class time instead of participating in discussions. In the third iteration, therefore, the emphasis was on exploring gameful participation during class discussions and group design activities in addition to improving various existing course elements.

Role-Playing Card Game for Design Activity

This course adopted the concept of game "battles" for different levels of tasks and goals to be accomplished by the learners (Sheldon, 2011; Fishman et al., 2012), which also included the final DGBL design project. In digital games, players engage in various battles to take on the boss battle, which is the most challenging part at the end of a level. This requires the players to use the skills and knowledge (about the enemies) they acquire. In this course, the 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. While completing the 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 boss battle a more gameful effort, we created a role-playing card game for the group's final design activity in DGBL. The goal was to design a game utilizing learning and design principles while developing their design expertise. We highlight three main features of the card game: game content, role-play, and progression.

Game content

The students received a deck of cards in four colours (red, brown, green and purple) that indicate the four broad categories of design principles for DGBL (See, Figure 1): Game Structure, Learning Principles, Game-based Learning and Game Aesthetics. The principles were based on the class readings and discussions. The card game intends to support students in actively designing their games by utilizing these key principles. They started this game design activity during the second week (Day 6), so they could examine their preliminary game ideas from the first five days. The players were expected to

elaborate upon their game design by using the principles listed on the cards. Each card had assigned points (1 to 9), considering its' expected complexity of addressing the principles. They were also required to fill out scoring sheets, with which they could record the evidence of using design principles (i.e., describing existing or modified design). Students could compete on their development of design expertise, good use of design, and towards a good design of an educational game (between groups). Both their scores and design products represented their achievements.

Role-play

The players could assume roles of disciplinary, interdisciplinary or multidisciplinary experts, by choosing one, two, or more than two categories of cards. This was an opportunity for participants to think about their own design expertise, and to strategize how they could productively design together, rationalize their design choices, and score better for the game. The participants used character sheets to record their information about their roles.



[Figure 1] A Deck of Cards

Progression

Students played this game for three days. The

progression for three days was for both game content and role-play. On the first day, students received the first three categories of cards that use readings and activities from the first week. They took turns to randomly draw a card, and suggested a design solution to address the principle. On the second day, they chose the three expert roles (disciplinary, interdisciplinary, multidisciplinary) and used the fourth (Game Aesthetics) category, which addressed the readings and activities of the day. On the last day, they had opportunities to create their own cards (up to 15 points within 2-3 cards) for their chosen categories. Through this structured progressive play, the students were expected to handle the complexity of game design.

Data Collection and Analysis

Our research goal was to understand how the role-playing card game, introduced as a design change in the third iteration, helped bring out the gameful efforts of the graduate students. Our conjectures for the card game design were that participants would develop their own design expertise, strategize productive design together, and rationalize design choices while playing the game. To understand this process and to create design implications, we took an ethnographic approach to observe and document their discourse for these three days.

The data was collected through video recordings, artifacts and in-class observations by two researchers during the course. The video recordings were transcribed to analyze the discourse and how students exhibit gamefulness using Gee's (2014, 2015) framework of discourse analysis. Gee (2015) exemplifies how discourse of a game can be analyzed by considering conversational partners and the histories and complexities they bring to the encounter. We

examine students using the card game with conversational partners, the co-players, who bring their expertise or experience to the forefront through their discourse. In the initial phase of the analysis, we chunked observation notes and video data into meaningful episodes and activities (i.e., logs) of two groups. We specifically noted for students' conversation around each card (i.e., a design principle), and discussed them between the two researchers. We compared how two groups were taking the card game differently and examined how they were making decisions about their game.

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) (see Figure 2 and 3). CA was comprised of three female teachers from western Canadian schools, two elementary and one secondary levels. Their avatar names were Insyts Avator, Curious George, and Hariti. SA, on the other hand, had two female and two male teachers with diverse teaching assignments across the world, one in secondary school in Canada, two males teaching English as second language in Asian contexts, and another in health education. Their avatar names were Green Plesiosaur, Green Forest, King Fisher, and Monster Den. In the next section, we describe how the card game facilitated learners' engagement in gameful learning as they utilized the game towards their design task.

Findings: Design Discourse Guided by Game Rules

One of the more notable activities was the card game to ensure we had addressed the design principles of a good game. It was such a fun and engaging way to solidify our understanding of

good game principles.

- Hariti, Reflection Paper

I found us in deep conversation about each aspect of the game as directed by the cards.

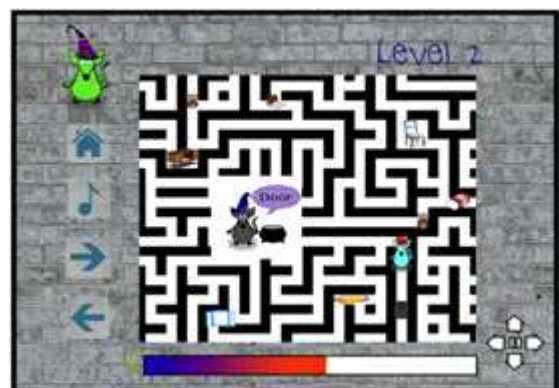
- Insyts Avator, Reflection Paper

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.



[Figure 2] CA: The Second Island Challenge

During the first week, students used their experience as educators and gamers/non-gamers to analyze and incorporate learning and design principles appropriate for their game design. Our analysis identified four emergent themes in the discourse of both groups. These were (1) figuring out how to play the card game, (2) alignment of the current design with principles, (3) modification of the design to incorporate principles, and (4) rationalizing for non-alignment of principles.



[Figure 3] SA: Level 2

Figuring out How to Play the Card Game

We found that the discourse of both groups was initially centered around figuring out the syntax and semantics of the card game (Gee, 2015) as in its' rules and content towards this design cum play activity. Both groups showed the lusus attitude of using the card game in their own ways. This brought out their identities as game players, game designers and engaged learners. The CA members was designing a science game for elementary students (Grade 2) involving concepts from boats and buoyancy (see Figure 2). They decided that their students would learn this content well through experimentation in the game. The CA members carefully followed the card game rules, by taking turns to read the card and identifying the evidence of using each design principle in their game, and deciding if each of them scored the assigned points in each card. On the second day (Day 7), each of them took on disciplinary, interdisciplinary, or multidisciplinary role as there were three options.

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 concentrated on conveying thematic "meaning" for players to learn vocabularies within the game. The game would progress through generation of various pictorial mazes (see Figure 3) at different levels or after failing a level.

Both groups examined the meaning of each design principle, such as "sense of agency" while figuring out the turns and points of each member by engaging in this card game. While figuring out the game, a discussion on the final goal of

their game design surfaced through the comment of Plesiosaur from the SA group,

"So what we want to do is get as many points for our team here as possible creating this game which would be all the cards that we use, we add up those points but we're not gonna use every card."

Such utterances by both groups showed that this experience enriched their interactions with the game design and learning principles, as they learned the rules of the game through play. As they progressed with the card game on the second day, some of this process continued as new rules were introduced each day. The group members re-examined the categories of the cards when choosing their roles. Having figured out how to play the game, they looked at the card content and started aligning the principles with their initial design ideas.

Alignment of the Design with Principles

We interpret Gee's (2015) x-ray vision in terms of how the learners see and interact with their design through the rules and contents of the card game. Both the groups started unpacking the principles enlisted in the cards and checking their game design to see if their design already incorporated the principles. Their conversation on the second day began with how it needed to incorporate both novelty and structure, considering the newly given cards on game aesthetics. They deconstructed this notion and their game ideas to see how the principle works. Curious George, deconstructed their game as she spoke:

"I think we have an excellent job of this [novelty and structure] because the structure and the way the islands are set up is the same all the way through, and the only thing

that changes is actually the task... There is definitely something different at every level, and it progresses in difficulty.”

SA group, on the other hand, had a classic vocabulary acquisition design idea, which challenged them in aligning their game with the design principles from the literature that were often focused on complex video games. Without changing the premise of their game idea, they tried to align their design with the principles on narrative structures. For example, on Day 7, they designed clearer levels for players to notice the increasing number and difficulty of the vocabularies as players progress. Again, with game mechanics principles such as Focusing Attention & Balance, they specified how the magic balls added time pressure or the countdown of the timer increased the sense of urgency for language learners since the players had to deal with more words and more enemies at each level. One of the members, who had used Minecraft while teaching a Technology course in middle school, suggested incorporating the design conception of monsters and zombies attacking the players while learning language, as seen in Minecraft adventure mode. Thus, SA's work of utilizing the principles from the cards showed infusion of their own experience.

Modification of the Design using Principles

We observed a consistent effort to modify or elaborate upon the design to incorporate various aspects of the principles in the cards. On Day 6, while discussing game structure (Navigation and Clues), the CA group decided that the AI or the monkey should provide instructions when the players are unable to progress. 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 could offer hints at the beginning to better explain what the players should do. The CA group, going through the cards on game aesthetics, began to analyze their game for all elements of aesthetics and examined how the game instructions and hints could be presented as texts. They embraced their lack of awareness on this issue and expanded their discussion to the need of the learners. Hariti said:

“I think he should talk because then even if we made it so you could switch the talking on and off, and then even if we wanted the kids to read or just listen, higher needs -- children with higher needs...”

The SA group on Day 7 was focused on how learners relate to the vocabulary themes within the overall narrative of collecting and delivering items to the sorcerer, in order to create potions to defeat attacking 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. On Day 8, they worked on retaining the interest of the players, and came up with how to make failures interesting. 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 or sudden appearance of enemies. By going through each principle card, they had an opportunity to think

more critically about their design of the game. This provided a glimpse of how they fused their teacher and game designer identities that engaged them much more deeply in their informed design practice.

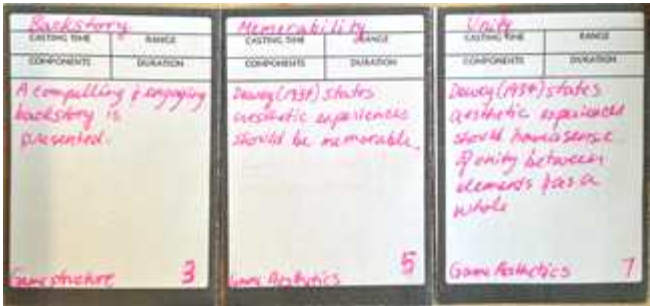
Rationalizing for Non-Alignment of Principles

It was clear that both groups also cared about scoring points. CA group made multiple changes to their game design throughout the three days to improve their game. For a principle they did not see a clear fit, they rationalized, “we kind of made softer rules than some videogames because it’s for a younger audience, right?” They argued that theirs was not about having a certain hook, but more of a friendly game with a “friendly feel” for their audience (Grade 2). On Day 8, students had to create new principle cards for their games. We expected that these cards might indicate their identification of what they valued in their games. Their discussion centered on which principles to add so that they could score with things they could improve upon during these three days. CA members created a card on Backstory under Game Structure, which read, ‘A compelling & engaging backstory is presented’ with 3 points. They created two cards on Game Aesthetics based on Dewey’s account on aesthetic experiences: Memorability and Unity. They initially assigned 5 points to all three cards, but upon critical examination realized how it was a challenge for them to address Unity in their game design and how backstory was not as complex. They finally decided to give Unity principle 7 points and Backstory 3 points (See Figure 4).

SA group 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 how their game could not fulfil many of the principles in the cards without completely changing its design. In particular, the SA group’s discourse clarified how they started rationalizing and reasoning to account for non-alignment of principles. Their language game was focused on rewards and repetition, and they began reading research on vocabulary learning. They identified one idea from the literature aligned with their game - that of creating a success and a failure state. They connected this to the aspects of linguistics in the game. A member of SA group read the relevant line to the rest of the group:

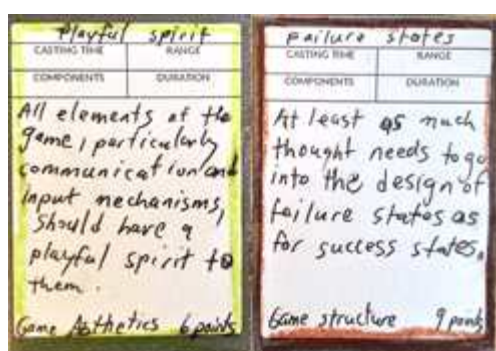
“Meta-linguistic descriptions and terminology should be presented through... show supporting material and as part of the game play... absolutely.”



[Figure 4] New Cards by CA

They decided that this would be the new principle to be added in their collection of cards (see Figure 5). They categorized this card, “Failure State” under Game Structure and assigned 9 points. 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 sustaining interest in the game because they were aware how vocabulary mastery games usually 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 (See Figure 5). This exemplifies how they tried to use the new design principles in a broader context to make the design of their game 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.



[Figure 5] New Cards by SA

Conclusions and Implications

The role-playing card game utilized the design principles of DGBL, which supported the students design discourse toward the goal of creating a good game. Our research addresses the concern that game-like activities in the classroom focuses on the extrinsic reward structure to motivate learners (e.g., Hanus & Fox, 2015), whose direction departs from the spirit of being gameful. The earlier iterations of the course had identified the need for more playable in-class activities. At the same time, when designing for games or any experiences for learning, graduate students, who are experienced teachers, often had difficulties connecting their practices with principles and theories from the readings. This third iteration, therefore, was designed to accommodate in-class design activities through a role-playing card game, which facilitated learning through play.

Our findings show that the graduate students in the process of playing the card game were able to interact and draw connections and meanings with the DGBL learning and design principles for their game design. Improving their game design was the main goal of the game, while turn-taking, scoring and role-playing were the mechanisms for them to sustain the play. They had to consider all the principles in conjunction with their own scoring of points in the card game to validate their design. We suggest that this game design card game provided the graduate students what Gee (2008) called “a goal-driven problem space” (p.26) where players, in each turn, solve the problem of addressing new design principle toward the common goal of creating a good game.

In addition, our findings demonstrate that their card game play and learning was situated within the broader context of DGBL and other scholarship. The impasse that the SA group experienced with the design principles and their game design challenged them to make efforts to understand outside/related literature on language learning while playing this card game. Their discourse was driven by the learning goals they set for their game while playing the card game in addition to further incorporating and addressing the design principles. For CA group, the three teachers interpreted the design principles with the goal of making an age-appropriate game for the grade 2 students. The SA group had a clear goal of supporting language learners informed by language learning research. This also showcase how their game design was guided by their history and experience as teachers (Gee, 2015) in terms of disciplinary expertise and their understanding of their learners.

Our findings also substantiate that the rules of the card game (progression, turn taking, role-play, etc.) sustained the play, thus a deeper

engagement with their own game design activity. How the rules affect the group dynamics is evidenced when the CA group diligently followed the card game rules (i.e., taking turns) and displayed more equity in member voices. The SA group had free flow of ideas, which often deepened their design discourse but possibly compromised some quieter voices. The players' choice of cards allowed for meaningful roles highlighting collaboration and integration of multiple disciplines towards gameful learning. It shows that each group changed how they think about their game design through goal-driven, rule-based design discourse. Their learning was situated in goal-driven experience (Gee, 2008), supported by the card game. We suggest that even though graduate students have agency in their own construction of knowledge and learning artifacts, a gameful learning activity, such as above mentioned Game Design "Game", could deepen their discourse on and design for learning.

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