

GameLog: Fostering Reflective Gameplaying for Learning

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Abstract

On the surface, it seems like teaching about games should be easy. After all, students are highly motivated, enjoy engaging with course content, and have extensive personal experience with videogames. Games education in reality is surprisingly complex. In game classes, students are often asked to reflect, generalize, and articulate their understanding of games as they play and analyze them. Educational research suggests that these tasks are particularly challenging for students. We report on the use of GameLog, an online blogging environment for supporting reflection on gameplaying experiences. GameLog differs from traditional blogging environments because each user maintains multiple parallel blogs, with each blog devoted to a single game. GameLog was used in two university level games-related classes. Our results indicate students perceived writing GameLogs as a positive learning experience for three reasons. First, it improved their relationship with videogames as a medium. Second, it helped them broaden and deepen their understanding of videogames. Third, it provided a vehicle for expression, communication, and collaboration. Students found that by reflecting on their experiences playing games they began to understand how game design elements helped shape that experience. Most importantly, they stepped back from their traditional role of “gamers” or “fans” and engaged in reasoning critically and analytically about the games they were studying. Our analysis of the students’ GameLog entries supports the students’ perceptions. We identified six common styles of entry: overview, narrative, comparative analysis, plan/hypothesis, experiment, and insight/analysis. These styles align with practices necessary for supporting learning and understanding. We propose that blogging about gameplay experience, as a reflective writing activity, can help lay the foundations on which further learning and understanding of games can happen.

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1 Introduction

According to the Entertainment Software Association (ESA), 75% of heads of households in the US play videogames and the average game player (not buyer) is 30 years old [ESA 2005]. These statistics are similar in other countries such as Great Britain, where 59% of the population between 6-65 years of age

are gamers [Pratchett 2005]. For many, computer games are already a phenomenon of greater cultural importance than, say movies, or perhaps even sports [Aarseth 2001]. Videogames are undeniably affecting our culture, the way we socialize, communicate, and how we think about the world.

The increasing cultural importance of videogames coincides with an increased demand for knowledge, skills and training for people who have an interest in learning about and studying games. The last five years have witnessed an explosion in the number of universities and colleges that are teaching “game courses” and offering game-related degrees. Colleges and universities are not only teaching classes in game analysis, design and development, but they are also wrestling with how best to do it, what the challenges involved are and what they should expect students to learn.

We believe it is also important to understand the challenges faced by learners taking these classes. What difficulties do they encounter? In what ways can we better support them? How can they get the most out of the practical, and often encyclopedic, knowledge they have of games?

In many game classes, students are asked to think about and reflect on their understanding as they play, analyze, and think critically about the games they play. Activities that foster reflection and help students monitor their current level of mastery and understanding are referred to as meta-cognitive [Flavell 1973]. Successful use of meta-cognitive abilities and strategies is believed to be an important part of learning [Bransford et al. 2000]. By focusing on sense-making, self-assessment and reflection on what worked, what needs improving, etc. these game classes use a meta-cognitive approach. Educational research suggests that meta-cognition itself is a challenging skill that must be learned and practiced [Barron et al. 1998; Bransford et al. 2000]. This challenge also applies to games classes.

In a prior research study, we performed in-depth interviews with twelve professors and instructors from a variety of institutions of higher learning [Zagal and Bruckman 2007]. Our research explored the issues and challenges that games class instructors faced across a variety of different classes. This research found that, among other things, despite years of experience playing games, students often have difficulties articulating and expressing ideas about games and gameplay. Although they often have a good feel for gameplay aspects, they find it challenging to describe what these aspects are, and how they interact with each other to produce a game experience. When asked to provide in-depth game analyses, students often dwell on superficial features of games and use a language and style modeled after game reviews from mainstream games journalism. Unfortunately, game reviews, which are written to help consumers decide whether or not they want to purchase a certain game, are a poor referent for the kinds of critical writing they are expected to do for class. Also, students lack the vocabulary for understanding, and

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describing, what happens when they play games. Playing a game can be a personal experience, and while students may be adept at discussing the technological issues involved in game development, describing the emotional experience is something they aren't accustomed to doing [Zagal and Bruckman 2007]. These findings are consistent with what we will report on in this article.

We are exploring ways to support learners by using GameLog, an online blogging environment designed for supporting reflection on game playing experiences. GameLog has been used in several university undergraduate and graduate level classes. We report on our findings regarding the effects of its use and discuss the role this tool can play in the context of a university games course.

2 Blogging for Learning

As a theory of learning, constructivism promotes the idea that learners actively participate in the learning process by building knowledge structures for themselves. Rather than being transmitted through instruction, a book, or some other form, knowledge is constructed or created by learners as they build their own cognitive structures or mental models [Piaget 1972]. In this context, writing can be a powerful tool for constructing new knowledge [Forte and Bruckman 2006]. Research has long suggested that writing can empower learners to reflect on what they know and integrate existing knowledge with new knowledge [Britton et al. 1975; Emig 1977; Bereiter and Scardamalia 1987].

There are many different ways in which writing activities have been successfully used for learning. However, we are interested in one in particular: the learning log. Learning logs are written responses to learning where students reflect on their understanding, thoughts, and ideas about their study [Baker 2003]. They are used to stimulate metacognitive awareness in learners. By keeping learning logs, students can assume responsibility for and take command of their learning [Commander and Smith 1996]. Traditionally, learning logs are paper based. However, in the form of weblogs or blogs, educators have also begun experimenting with taking learning logs online [Stiler and Philleo 2003; Reagin 2004; Wiltse 2004; Du and Wagner 2005].

A blog is a user-generated website where entries are made in journal style and displayed in reverse chronological order. They are generally publicly readable and, by allowing visitors to post comments, allow for limited asynchronous interaction. Research has shown that, among other things, people are motivated to write blogs in order to express themselves, as an outlet for thoughts and feelings, as a way to think by writing, and to foster community [Nardi et al. 2004].

In the context of learning, and in addition to the effects of paper-based learning logs, blogging offers possibilities for collaborative learning by allowing learners to share knowledge and experience with each other. Additionally, learners can be exposed to a diversity of perspectives and interact with each other in constructive ways. The personal nature of a blog together with its public nature is also aligned with the idea that people learn better through building personally meaningful artifacts and sharing them with others [Papert 1991].

In the following section we introduce GameLog, a custom developed online blogging environment designed for learners to engage in reflective practices of their gameplaying activities. We consider it a domain-specific kind of online learning log designed to, among other things, help people think about their experiences with games, achieve a deeper understanding of games, establish connections across games, identify structural gameplay elements in multiple games, understand how gameplay can evolve and change over the course of a game, and articulate the emotional and personally meaningful experiences they have while playing.

3 GameLog

GameLog is a publicly accessible online community where people keep track of the videogames they are playing as well as those they've played (available at <http://www.gamelog.cl>). GameLog's primary feature is to allow registered users to write a blog of their gameplaying experience for each game they play. It is different from traditional blogging environments because each user maintains multiple parallel blogs. Each GameLog is devoted to a particular game. When a user starts playing a new game, he creates a GameLog for that game and can then write his thoughts and feelings about it. When done playing, he can "close" his GameLog and indicate the reasons for closing the GameLog. Figure 1 shows a few GameLogs created by a user. As indicated by the "Finished" status, this user's GameLog for *The Sims* is currently closed. The GameLogs for *Grand Theft Auto-San Andreas* and *Zelda: Windwaker*, are also closed, but the user has indicated more information about why he is no longer playing them. Despite being closed, all three GameLogs are still available for public reading. The GameLog for *The Sims 2*, is marked as "Playing", indicating that it is an active, or open, GameLog.

[User Name]'s GameLogs		
[User Name] has been with GameLog for 0 years, 4 months, and 5 days		
	Game	Status / Read GameLog
1	Grand Theft Auto - San Andreas (PS2)	Stopped playing - Something better came along
2	The Sims (PC)	Finished playing
3	The Sims 2 (PC)	Playing
4	Zelda: Windwaker (GC)	Stopped playing - Technical problems

Figure 1: List of GameLogs (user has been anonymized)

For each open GameLog, the owner can write an unlimited number of individual posts or entries. Each entry also includes the date and time written, when it was last edited and the number of total edits made since it was posted. In traditional blog manner, when viewing a GameLog entries are displayed in reverse-chronological order. Users, including the owner, are allowed to write follow-up comments to each post. Table 1 shows a fragment of a post written for a particular GameLog. Whenever someone writes a comment on an entry, the owner of the GameLog is notified via e-mail and provided with a link to reply. The site also offers basic search and browsing functionality to allow users to find GameLogs written for particular games or by other users.

Table 1. GameLog excerpt (Legend of Zelda: The Wind Waker)

November 19, 2006 10:20:48 AM

I went exploring again in Wind Waker, mainly to fill in some of the spots on Link's map. After a while, I came across one of the huge whirlwinds and fought the critter on a cloud inside of it. Even though it made it rather hard to aim at the critter properly, I really like the fact that the winds from the tornado affected the arrows Link shot off. Really, wind seems to be implemented better/more in this game than most others... which is appropriate, considering its theme. I just wish more games with weather effects -had- actually effects from the weather, not just pretty graphics. (Not that I object to pretty graphics.)

After beating the cloud-guy...

4 Study

In Fall of 2006, GameLog was used as part of the regular curriculum in two game classes, taught by the same instructor, at a local university. The first class was an undergraduate lecture-style class where students explored and analyzed key developments in the history of digital media (U-class). While videogames were a significant part of the curriculum, students also learned about virtual environments, interactive television, the world wide web, and artificial intelligence for interactive characters. The second class we studied was a mixed graduate and undergraduate discussion-based class where students debated and engaged in issues of game design and analysis as a cultural practice (G-class). In this class students also explored game genres and their representational goals. In both classes students were required, as part of their regular coursework, to play and design games, read scholarly articles, and turn in written assignments.

4.1 Data Collection and Analysis

As part of their regular coursework, students in both classes were asked to keep a GameLog and write about their experiences playing a game chosen from a list of assigned games for that class. For the U-class, students were asked to choose one game, while they had to choose three games in the G-class. In both classes students were asked to play the game on at least three different occasions for at least 30 minutes each time. For each time they played the game, they were asked to write a GameLog entry. The assignment asked them to write about the experience they had while playing the game, including their thoughts on the characters, narrative and gameplay (characters and story, for the U-class). Also, in the case of the undergraduate class, students were asked to submit a short response summarizing their experience with GameLog. The students' GameLog entries were not graded in the U-Class, though they were assessed on the quality of the short responses they submitted. In the case of the G-Class, students were graded on their completion of the assignment, not on the content of their written GameLog entries. The duration of the assignment was officially one week, although students were encouraged to begin their GameLog activities sooner.

A total of 137 entries were written by 35 students (24 U-class, 11 G-class). The average entry was 235 words long with a standard

deviation of 119 words. The shortest entry was only 17 words long, while the longest was 773 words. The entries written were analyzed and coded in an iterative process in order to refine theoretical categories, propositions, and conclusions as they emerged from the data [Glaser and Strauss 1967]. The results of this analysis will be discussed below.

Additionally, once both classes had concluded, we conducted eight in-depth interviews. Three interviewees were chosen from the U-class and four from the G-class, in addition to the course instructor. As recommended for qualitative research [Glaser and Strauss 1967], we employ theoretical sampling in which cases are chosen based on theoretical (developed a priori) categories to provide polar types, rather than for statistical generalizability to a larger population [Eisenhardt 1989]. Interview subjects were selected based on their academic level (undergraduate, graduate), level of interest displayed during class (engaged, not engaged), and participation on GameLog (minimum required, active participation).

Interviews were conducted in person and by telephone, averaging 46 minutes and ranging from 22 to 82 minutes in length. All interviews were audio-recorded and transcribed. In addition to asking students about their experience using GameLog, our interview protocol includes questions about potential challenges of learning about games. The answers to these questions corroborate data obtained in a prior study [Zagal and Bruckman 2007]. The student protocol also includes open-ended questions about their expectations regarding the course and changes they would make to the assignments. Interviews were semi-structured to ensure that all participants are asked certain questions yet still allow them to raise other issues they feel are relevant to the research.

Data from the interviews was used to contextualize and provide additional insight to the analysis of the GameLog entries. All interviewee names appearing in this article have been changed for reasons of privacy.

5 Student Impressions

Interview data, together with the personal responses submitted in the U-class, shows students perceived writing GameLogs as a positive learning experience for three reasons:

1. Improves relationship with videogames as a medium
2. Broadens and deepens understanding of videogames
3. Provides a vehicle for expression, communication, and collaboration

Additionally, students generally responded favorably to the GameLog assignment. They reported the experience as interesting and enjoyable and remarked on its utility to them from an educational perspective. Aaron felt that "this written assignment is the best one so far", while Benjamin comments it was "an interesting and productive experience." Cynthia summarizes the general impression of the students: "I found that writing journal entries about my game play was quite fun."

5.1 Improved Relationship with Videogames

For the most part, students in both the graduate and undergraduate classes have had an extensive personal experience with videogames and these are an important part of their everyday lives. Videogames are a medium that they enjoy and are familiar with. Many students commented how the experience of writing about the games they played improved their enjoyment of games in general. Dominic describes how “writing my GameLog allowed me to work through my gaming experience. [...] I was able to get a deeper appreciation for the game that I was playing.” Ellen doesn’t consider herself a gamer and wrote about a game she had never played before. Like others, she noted how “I thought it was an interesting way to approach playing videogames because this helped me understand how I was playing and what I was doing. I think that now, when I actually play games, if I approach the game a different way maybe I would enjoy playing games more, or I would have a better time.” During their experience with GameLog, students begin to realize that engaging with the medium of videogames is an active process requiring more than “merely” playing. In addition to playing, they also reflect on how they are playing, what their expectations are, and what they feel when playing. Thus they begin to understand how a game playing experience depends not only on the particular game played, but also on how the game is approached.

Writing GameLogs helps highlight the tension between playing games “for fun” and for deeper understanding and analysis. Frank notes that “I don’t believe it made me play the game any better than I normally would have.” Playing a game with an eye for analysis requires a different approach. This surprised some students like George who commented how the assignment “took away from the experience of playing the game. It was like reading a really good book and stopping and taking notes. It’s just not the same as reading it for pleasure all the way through with no interruption.” Harrison even felt that games like *Grand Theft Auto* are “meant to be played and enjoyed, not to be thought out or analyzed.” When faced with an assignment that required using their experience as a resource for analysis and understanding, students begin to wrestle with the notion that games are more than “consumer media goods” and can be engaged as cultural artifacts with embedded meaning and ideas. In this way, they can begin to approach and understand videogames differently and thus become better prepared to study and learn about them.

“I came to analyze the way that I was playing, the way that I was actually using the games, and my experiences doing that. You never really think about that. I guess most people don’t really think about what they’re doing when they’re playing games or how they’re playing the games” - Isabel

5.2 Broader and Deeper Understanding

In addition to changing the way they related to videogames as a medium, students reported how the reflective writing activity helped them achieve a deeper understanding of the games they were studying. “It helped me understand a bit more. When you play through, you’re kind of in it, so it’s hard to have an insight. Writing afterward is like looking in from the outside. It helps you put on a different perspective” says Jeremy. Like many of his classmates, writing on multiple occasions about different sessions of gameplay helped him understand a particular game in different

ways and focus on specific elements or aspects of a game that would previously have gone unnoticed. Kathy describes her experience with *Façade*, an interactive drama game, where the player witnesses, and tries to mediate the marital crisis of the non-player characters Trip and Grace:

“I begin connecting any little action I executed in the game to any response that the interacting characters gave. For example, two of the three times I played Trip recounted several things I had said throughout the evening and I begin to connect that somehow he thought I said such-and-such when I had actually meant something totally different. Looking back over the conversation as I was journaling I began to realize how the characters interpreted different comments depending on their mood at the moment. For example, when Grace was angry because of a previous comment by Trip, she always interpreted my comments as invading on the territory of the marriage.” - Kathy

By reflecting on their game playing activity, students like Dominic note that “I was able to see that there were more things to the game than just following the missions.” The reflective process helps them realize certain non-obvious insights. For example, Meredith noticed how feedback from non-player characters serves as a reward in *Harvest Moon* while Louis had an insight on the effect that the character creation systems has on the narrative in games like *Oblivion* and *Knights of the Old Republic*. Nigel debated how the voice of Carl, the player-controlled character in *GTA: San Andreas*, helped create a less immersive experience than that of *Grand Theft Auto III*, despite the similarities in their gameplay. Even students like Jessica, who felt that the GameLogging experience detracted from her enjoyment of the game, remarked how “I did understand the game more than I did before.” By writing their GameLogs, students begin to understand the role that certain elements play in the experience or design of a game. They can also begin to relate them to each other, and see how sometimes the same elements appear in other games, playing different roles.

Harrison commented on the fact that “when you analyze the game you can’t help but notice the many shortcomings in the game. [These issues] can be easily ignored if you’re just playing, but when you write about it you can’t help but think about it.” This comment illustrates another issue that the students are beginning to come to terms with: distinguishing the “parts” of a game and how they function, from the impact they have on the game and the experience of playing it, as a whole. Jeremy illustrates how “I noticed that looking in from the outside, the game maybe is pretty simple and even flawed, but when I played it, the game was much better. It was like understanding how the whole was greater than each of its parts.”

Understanding a particular game, however, can mean more than the ability to deconstruct it, or view it holistically. Maurice describes how writing a GameLog “helps me get in tune with what I just did and keep track of what’s going on over the long term. Journaling gets me to think of the game outside of playing the game itself.” Maurice begins to make sense of his experience and can understand the game in a broader context. Orianna provides an example:

"I played Zelda [Wind Waker] and writing about it made me think about its gameplay in comparison to other games I had played. I hadn't really played Zelda since the NES. It was really interesting for me to think about the one I was playing on the Gamecube, compared to the original NES version because they are two completely different types of game now. The hardware systems are totally different, what you can do is totally different, and so on. However, it was still strangely familiar..." - Orianna

Writing about their gameplay experience helps students view games in a broader context that allows them to establish connections: between games, in relation to other media, and even with respect to socio-historical settings. Isabel describes how "I began to realize that you can't describe a game like a movie. Well, except for the pre-game movie-like clip [referring to cut-scenes]... In describing a game you have to get into different details than movies even though when you look at someone playing a game, they can look very similar." Orianna summarized the role of the experience as helping to "start thinking about more than just the gameplay, but also the physical aspects of sitting down and playing a game, analyzing them culturally, and how do they relate to other practices. How do games relate to our experiences, not just with games, but with other people and the world, how have they changed? It's about trying to think about games as a much broader subject."

5.3 Expression and Collaboration

Students described writing GameLogs as a positive learning experience because it allows them to articulate ideas they have difficulty communicating, express themselves, share opinions and, to a lesser degree, collaborate in creating a shared understanding of a game. Patricia describes how "I thought I knew the characters, but trying to explain their personalities and habits was quite hard until I really sat down and did the GameLog." For Orianna, writing a GameLog provided a different opportunity:

"It was interesting to see whether other people thought the same things about the game that I did. I was playing an abstract game and was curious to see if they had the same notion of it as I did. Or, was I completely off-base? It was hard for me to know what should be interpreted and what not. And so, it helped to read what other people think" - Orianna

In both classes studied, students were asked to write about their experience with a game from a relatively small list. Since GameLogs are publicly readable, this meant that students enjoyed access to the wealth of opinions, thoughts and experiences of their peers regarding the games they were playing and studying. As mentioned by Orianna, this allows students additional opportunities for reflection, as they read each others' GameLogs. We note that the students were not explicitly asked to read each others' work, but most chose to do so anyways. By reading their peer's thoughts and reflections, students can begin to understand how different people may experience games differently, see what their peers have chosen to focus on, and learn about aspects of a game that they may not have noticed or cared to think about. This experience can help broaden the understanding of games. It also helps students consider the reasons and motives people might have for playing games they may not care for.

"I've never understood why people play The Sims. So here I was playing it and trying to get into those reasons. And so, it was interesting to read other peoples thoughts and then think about it, because I didn't feel the game that way. What actually grabbed them was something that I didn't care for, but now I had a sense of what it was. To me, that was totally unexpected." - Quentin

Some students also took advantage of the feature on the site that allowed them to comment on each other's GameLog entries. Comments posted were generally supportive and friendly. There were no incidents of deviant behavior such as personal attacks or inappropriate comments. This could be explained by the prior knowledge students had of each other. Raphael's comment highlights how an appreciative audience can positively affect the experience of writing and reflecting:

"I liked the feedback. It made me feel less worried that I was a horrible video game player and concentrate more on my experience. I don't necessarily want tips on how to play the game but commenting on my blog makes the blog experience better. Why have a blog in the first place if nobody else is going to read it?" - Raphael

In this section we have discussed the students' perceptions and feelings about writing a reflective online journal of their gameplay experience. In the following section we will describe the results of our analysis of the students' GameLog entries.

6 Log Entry Analysis

Our goal in analyzing students' GameLog entries was to get a sense of the kinds of things students write about as well as how they write them. Would they tell the story of what happened when they played the game or would they write about their difficulties playing? Would they approach the assignment as a chance to analyze specific aspects or would they try to convince the reader on the merits (or lack of) of the game played?

From our analysis we were able to identify common patterns across multiple entries. From these patterns we determined six prototypical styles of GameLog entry: overview, narrative, comparative analysis, plan/hypothesis, experiment, and insight/analysis. The diversity of styles found illustrates the multiplicity of ways students approached the task of reflecting on their gameplay experiences. Not all the students approached the task in the same ways, and students also often changed their approach from one GameLog entry to another. Also, some students wrote entries that took multiple approaches and mixed styles. This was common in more extensive entries.

We will now briefly describe each style, show an excerpt from a GameLog entry that exemplifies the style described, and also discuss the pedagogical role that each of these styles plays in the context students learning, and creating a deeper understanding of games. The excerpts are reproduced verbatim from the students' GameLogs. For reasons of privacy, the usernames the students used to write have been replaced with pseudonyms.

Overview: A general description of the game written for a reader who is assumed to be unfamiliar with the game in question. The

description is often accompanied by criticism or praise for certain aspects of the game and may also include references to other games.

“Boundish is part of Nintendo's Bit Generation series. The complete series includes Soundvoyager, Orbital, Coloris, Boundish, Digidrive, Dotstream, and Dialhex. I just ordered the complete series from eBay, and I can't wait for them to arrive.

Of the five games on the cart, I've spent most of my time tonight playing Box Juggling and Human League. Both of these games are best described as Pong variants and tributes to early moments in videogames.” - Zach (Boundish)

Writing an *Overview* requires that the student reflect on the game and consider how it should be presented to someone who isn't necessarily familiar with it. It is an exercise in contextualizing the game for an uninformed reader. Writing an *Overview* requires dealing with questions like: What are the important features? What is the core gameplay? What does the reader need to know in order to get a feeling for what this game is like? Our data shows that entries written as an *Overview* were often the initial (earliest) entry written for a game.

Narrative: A description, generally written in first person, of what the player did, and what happened during the game session. It is usually accompanied by descriptions of relevant or necessary parts of the game and is interspersed with minor insights and observations made by the player.

“After that, I decided to do Joey's last mission as well: The Getaway. This mission was ridiculously easy compared to his previous one. I had to be the driver for a bank robbery. After the robbery, I had three stars, but immediately dropped one by picking up a police bribe in an alley. I then drove to a Pay 'n Spray to get rid of the remaining two.” – Samuel (Grand Theft Auto III)

The *Narrative* style is well suited for describing general gameplay. When students write in this style, they revisit their experience and can begin to understand the relationships between their actions in the game, and the results, or effects, of those actions. By recounting the events of their gameplay session, students can also begin to formulate questions and ideas that might be the focus of attention in later gameplay sessions. This style of entry was the most common.

Comparative Analysis: Describes certain specific elements of a game and compares them with a similar game, usually another game in a series. The comparative analysis usually includes recommendations to the reader or opinions regarding the differences noted.

“In the game cube version, there is a ghost that comes along during the night which asks you to catch squiggly ghosts things for him. However, there is apparently no such fun thing to do at night in the DS version. [...] A couple of the towns people were still up, wandering about wanting to show me letters and chat about the acorn festival. [...] But, if you ever play the DS version, don't waste your time playing

after 11pm when the stores close unless you feel like looking at constilations.” - Patricia (Animal Crossing: Wild World)

When writing a *Comparative Analysis*, students focus their attention on the differences and similarities between two games. They can begin to develop a deeper understanding of games by identifying elements common to both games, exploring how these elements play different roles in games, and how the resulting game experience may be similar or different. *Comparative Analysis* style entries were usually written by students who had extensive prior experience with games that were related to the one being written about.

Plan/Hypothesis: A description of goals the player wants to achieve in the game, or questions the player wants answered regarding the game. This is followed by a plan or strategy for achieving them. The plan is often accompanied by hypotheses about how the game works. The results of the plan are usually referred to in later entries.

“I decided to start a new family. I chose a pre-made brother and sister to run a much more hands-off business. Now this is the coolest thing ever. Basically what I'm going to do is buy neat stuff and make other sims pay just to come onto my lot. Sweet! (I'm still planning to start off with a little extra money, this way I can figure things out. It's rough when they're uber poor and you don't even know what you're trying to do.)

Some things I'm curious to find out:

- 1) Will I be able to make enough money for them to survive? (naturally)*
- 2) Can the business still grow when I'm not actually trying to sell things?*
- 3) Can the business stay open when they're both at work??” - Cynthia (The Sims 2)*

When articulating a plan of action to follow in a game, the player demonstrates that he is actively reasoning and engaging with the game at a meta-cognitive level. Thinking ahead, and formulating questions and hypothesis are important for fostering learning and understanding [Bransford et al. 2000]. By writing a *Plan/Hypothesis*, a student can reflect on his understanding of a game, and come up with a way to correct or improve it. Entries written as *Plan/Hypothesis* were often followed by entries written in the style of an *Experiment*.

Experiment: A description of an experiment performed during the gameplay session. The objective, or reason, for the experiment is described followed by how the goal was pursued. What actually happened, together with insight that resulted from the experiment, is also recounted. Evidence for the insight usually comes from the results of the experiment itself.

“I didn't want to simply run around the world, completely defining the main character, CJ. I wanted to catch a glimpse of a few cutscenes to see how the developer's characterize CJ. In order to get this done, I have to attempt a few missions. Not only do these cutscenes develop the characters, but they advance the

storyline. This particular mission has me picking up women for a rapper's party. When OG Loc, the rapper, is giving me my instructions he comes off as a lame, overly ambitious rapper with delusions of grandeur. The whole time CJ is completely cool, understanding that Loc has less musical talent than Milli and Vanilli, but still playing along like he's the second coming of the Dr. Dre. In this cutscene we have humor, character development and a small suggestion that the player is somehow "cool". We see an imbecile like OG Loc and can relate to CJ's feeling of superiority." – Thomas (GTA: San Andreas)

From a learning perspective, writing an *Experiment* is pedagogically similar to the *Plan/Hypothesis*. They both show that the student is actively engaging his knowledge and understanding of a game. The *Experiment* however, provides the opportunity for reflection on the results of the experiment.

Insight/Analysis: A description of a specific insight that happened while playing, or an analysis of a specific element or aspect of the game. The analysis is usually accompanied by supporting evidence from the gameplay session. Occasionally, there is some commentary on the effects or meaning of the insight.

"Outset Island and its inhabitants exist less as people and more as a tutorial for novice players to learn the particular game-isms of The Legend of Zelda series. It's actually interesting to note the various ways the landscape of the island, the NPCs living there, and even the small sidetasks are all explicitly designed to acclimate players to the basic controller functions that will be necessary to play the rest of the game. The simplest concepts: the necessity to collect rupees to buy things (reinforced in multiple ways), the basic combat system, and even the item collection/buying/button assignment mechanics are all explained at this juncture."– Victor (Legend of Zelda: Wind Waker)

Students writing entries in the style of an *Insight/Analysis* are practicing analytical skills that are important for learning. Writing in this style can help a student explore aspects of a game in a deeper way than they may be used to.

7 Discussion

On the surface, it seems like teaching about games should be easy. After all, students are highly motivated, enjoy engaging with course content, and also have extensive personal experience with videogames. However, as we have seen, games education in reality is surprisingly complex. Educators are debating what should be taught, how best to do it, and also finding that students face difficulties that they did not expect.

Our results show that the self-reported impressions that students have regarding the educational value of the GameLog assignment align with our analysis of what they wrote, and how they wrote, in their GameLog assignments. Each of the styles we found can play an important pedagogical role. For instance, the *Plan/Hypothesis*, *Experiment*, and *Insight/Analysis* styles are related to creating a deeper understanding of a particular game. The ability to pose

questions, create a plan in order to achieve some understanding, execute the plan, and finally reflect on its results are important skills necessary for achieving a deep understanding of a subject matter [Edelson et al. 1999].

We observed that not all the students adopted all the prototype styles and some favored one style over others. It is an open question whether or not students should be provided with further guidance on how they should write their GameLog entries. Should certain styles be favored over others? Can we assume that students are prepared to write in all the styles we've observed? Course instructors might want to scaffold students adopting certain styles based on their particular learning goals. There is also evidence that suggests that students adopt more reflective styles as their understanding and experience with the game increases.

The structure of the assignment also played an important role in allowing, and also guiding, students in writing about their experience. Students were asked to write three entries, each on a different gameplay session, about the same game. This kind of assignment is unusual in traditional learning environments where students aren't expected to re-visit and write about the same thing multiple times. Students whose first GameLog entry was written in the *Overview* style found that they had to write something different for their latter entries. This guided them into focusing and writing about specific issues and their analysis, comparing with other games, or viewing their future gameplay sessions as a test bed for planning experiments. In other words, they began to think about what they wanted to explore or understand, in order to have something to write about. This also helped them begin to approach the way they play a game differently. Instead of focusing on "just" having fun, they opted to train their eye on specific aspects or devised plans and experiments to test their ideas. The structure of the assignment was thus important in promoting skills and practices that are important for seriously understanding games. In traditional learning environments, students get only one chance to "get it right", after that they move on to the next assignment. Writing on multiple occasions about the same game helps incorporate iterative practices that have shown useful positive learning benefits in other contexts, such as science learning [Kolodner et al. 1998].

The quality of the student writing was another issue raised during the course of our study. Students perceive writing in a blog as less formal and more relaxed than a traditional class writing assignment. Their entries were commonly riddled with grammatical and orthographical errors considered inappropriate for a formal assignment. However, the informality was perceived by the students as liberating. In taking a more relaxed approach, students reported they could express themselves more freely and were able to come up with insights more readily. Since their writing occurred closer to the actual experience, they can capture information, impressions, insight, and feelings that are more personal and concrete. In the same way that the field notes of a researcher's observations are the initial step in the process of writing an academic research paper, a student's GameLog entries help lay the foundations on which learning and understanding can happen.

8 Future Work

This study is part of a broader research project exploring the educational and learning issues involved in studying games. We

are studying how to better support students leveraging knowledge from their personal experiences to create abstract and deeper knowledge about games. Our prior research with game studies instructors [Zagal and Bruckman 2007] has helped us design two online environments: GameLog and the Game Ontology Wiki. While GameLog is designed to help students reflect on their gameplaying experiences, the Game Ontology Wiki allows students to collaboratively build new knowledge about games while participating of a game studies research project called the Game Ontology Project [Zagal et al. 2005]. We are currently studying the use of these environments in a university classroom context. In particular, we are studying students' use of these environments over an extended period of time.

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