

# Muckrakers: Engaging Students in the Research Process through an Online Game

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The first known attempt to integrate gaming with library instruction, Muckrakers is a Massively Multiplayer Online Role-Playing Game (MMORPG) developed to support a required freshman writing class by engaging students in discovering the research process and its recursive nature. Other libraries have designed online tutorials, be they games or virtual guides to databases, and our library is no exception. But our experience with tutorials and the growing recognition, expressed in countless articles on the millennial generation, that our students enjoy playing online games and prefer learning interactively and cooperatively—behaviors ill suited to the tutorial fare we had offered them in the past—gave us pause. This paper details our own attempts to create engaging learning environments for these students, both in the classroom and by extension in an online game, the pedagogical foundations for our work, and tools for evaluation.

## **Pedagogical Context**

Our pedagogical practices and the game's development have arisen largely from the context in which we work, a context that will go far to illustrate our motivations in

this project. As members of the Education and Instruction Group (EIG) at Gelman Library, we partner with faculty in the University Writing Program's (UWP) UW20 component: a mandatory, thematic, 4-credit course for all freshmen at George Washington University (GWU). According to the program template, as described on the UWP-First-Year Writing's Web site, the course aims for

practice in the processes and techniques of academic writing, drawing upon stimulating topics of current intellectual interest that will invigorate students' writing. The course focuses on framing important questions, constructing an argument through identifying and discussing both supportive and contradictory evidence, accommodating a variety of purposes and audiences, and using the ideas of other writers appropriately. The value of revision for clear expression is a constant emphasis; review of conventions for syntax, grammar, and punctuation is incorporated as necessary.

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To that end, the UW20 curriculum emphasizes critical thinking, collaborative learning, and peer evaluation, which form the foundation of the course-integrated research sessions that EIG librarians teach in close collaboration with their assigned faculty members. Most of us had previously taught in libraries where the one-shot library session reigned, the faculty eluded us, and we could rarely determine a clear purpose for a library session. Working so closely with faculty in this program—in designing syllabi and conducting multiple research sessions for each course section—has pushed us to take risks in the classroom, to integrate our own teaching methods and purposes into those of our faculty, to get to know our students' needs and habits better, and to begin studying pedagogical theory for translation into classroom practice.

So just what are those teaching practices we share with faculty? What are the ways we put our egos on the line before a sea of young, blank faces, and how do we find out what's behind those faces?

### **Collaborative Learning.**

As EIG convened a pedagogy group to challenge our assumptions about teaching and learning as they apply to the library environment, we began looking more closely at a teaching method we had already put into practice. Collaborative learning in the guise of group work is nothing new—teachers of writing and of other disciplines have been doing it since at least the 1980s. Our faculty colleagues also design exercises for groups and ask them to complete tasks, brainstorm, or solve problems with their peers, so our research sessions involving group work create continuity through a learning environment familiar to the student—which is appealing to both faculty members and students. Collaboration is essential to millennials' learning styles and many of them in the real world will be asked to work in similar ways. As librarians, we have ourselves experienced successful learning by collaborating with fellow students and colleagues, though some librarians fear the loss of control group work entails and the time it takes away from “covering the material,” and they cringe at the thought that students don't know what we know, so how can they teach each other how to do research? Kenneth Bruffee posed this question himself in “Collaborative Learning and the ‘Conversation of Mankind’.”

How can student peers, who are not members of the knowledge communities they hope to enter, who lack the knowledge that constitutes

those communities, help other students enter them? The first, more concrete answer to this question is that no student is wholly ignorant and inexperienced. Every student is already a member of several knowledge communities, from canoeing to computers, baseball to ballet. Membership in any one of these communities may not be a resource that will by itself help much directly in learning to organize an essay or explicate a poem. But pooling the resources that a group of peers brings with them to the task may make accessible the normal discourse of the new communities they hope to enter. (Bruffee 1984, 644)

Group work isn't easy, though, not for student or teacher. It requires careful planning and adherence to some basic principles to make it productive and not simply time to chat about weekend plans. When it works, it reinforces what students already know, helps them formulate questions about what they want to know, and lets them learn from their peers.

### **Peer Teaching**

Where is the first place students turn when they have an information need? Most of us know they turn to their friends and classmates, who, as Bruffee tells us, are “not wholly ignorant” and participate in knowledge communities of their own. We also know that peer teaching results in “deeper level learning, critical thinking, shared understanding, and long-term retention of the learned material” (Kreigns 2003, 337). UW20 faculty capitalize on this pattern by having students regularly review each other's writing to offer critique and feedback, in years past the sole responsibility of professors. In library sessions, we ask students in groups to learn a database and then teach it to the whole class—this way students naturally avoid library jargon in favor of a shared vocabulary and teach the parts of the database that seem difficult or interesting to them, not just what we think they need to know.

### **Exploration/Discovery**

As Donald Finkel has eloquently noted in *Teaching with Your Mouth Shut*, “Our natural, unexamined model for teaching is Telling” (Finkel 2000, 2). In other words, when we teach, we tell our students what we want them to know, and, the assumption goes, they learn it. But Finkel also points out that “educational research over the past twenty-five years has established beyond a

doubt a simple fact: What is transmitted to students through lecturing is simply not retained for any significant length of time” (ibid., 3). Yet teachers continue to insist they must “cover” a certain amount of material or the students will come away ignorant of what they should have learned. In our library instruction sessions, we have leaned lightly on telling, heavily on time for students to explore and discover—though often that exploration is guided by questions or tasks that offer closure or purpose to their time in class. This allows us to teach at point of need (when students want to know how to find an article electronically) and to avoid “telling” them what they already know, or having our elaborate and, to our minds, clear instructions fall on deaf ears because of inattention. Point-of-need, self-guided instruction integrated with specific course assignments also plays a major role in student motivation to learn and their engagement in the learning process—two of the most critical factors in teaching research.

Such a teaching style further forces students to practice exploration under the guidance of a librarian so that the next time they are assigned a research project, they have a framework for figuring out for themselves where and how to begin. In other words, exploring itself is a skill that requires practice, and it is a transferable skill at that, one that will benefit our students immensely in their education and their work lives. Of course, millennials already use trial and error when they encounter new technologies or web contexts—but in some ways it seems we are here to teach them more patience with their trial and error, more strategic and critical approaches to exploration.

Each of these pedagogical strategies of engagement requires that students take responsibility for their own learning, and that as teachers we create environments that encourage learning and critical thinking, a key goal for the UW20 program here at GWU and, as we are partners in this goal, for the library’s instruction program as well. Although forging these pedagogical and intellectual partnerships has been very enriching and satisfying, it is also time intensive—both the preparation, the collaboration with faculty, and the thinking critically about teaching. We also find that no matter how many library sessions we do with one class (a range from two to five per section), we could still use more time, so we continuously reassess our teaching and the most effective use of our face-to-face time with UW20 students. Given the demanding research work that UW20 students are asked to complete—thirty-six pages of writing in one semester—we would prefer to

focus our in-class time on complex research problems rather than on building blocks and mouse clicks. We would also like to offer more instruction to other populations on campus, beyond our core audience of freshmen. At the beginning of 2005, we recognized the need for a form of virtual instruction in support of the UW20 program, which faculty would integrate into the course and which would enhance and extend our teaching methods. We wanted to develop virtual instruction that would encourage collaborative learning, peer evaluation, exploration, discovery, and critical thinking, and that would appeal to the current student generation’s preference for learning interactively and cooperatively, by doing and exploring, by producing and changing content.

### Learning, Motivation, Engagement and Games

“Today’s average college grads have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games (not to mention 20,000 hours watching TV)” (Prensky, *On the Horizon* 2001, 1). This quotation caught our attention as we were considering our options. Even the best existing examples of information literacy online tutorials, including those designed and implemented at our own library, did not address any of our requirements. Most online tutorials are organized linearly; are text heavy; involve very little actual interaction, discovery, or critical thinking; and are not collaborative efforts. By reading literature about the educational potential and value of video games, especially James Paul Gee’s *What Video Games Have to Teach Us about Learning and Literacy*, we saw how the video game format could be an extension of the type of teaching we had already been applying in our face-to-face classes, which are student-centered and based on the principles discussed above. Playing video games, especially wildly popular Massively Multiplayer Online Role-Playing Games (MMORPGs), is far from simple: players need to understand the intricacies of whole virtual worlds and economies, create strategies, learn complex systems of rules and players, and invest long hours in playing, as well as learning, the game. Nevertheless, they do so and are willing to pay money for the pleasure because playing takes them to an experience of flow.

Flow theory, the work of Mihaly Csikszentmihalyi in his landmark *Flow: The Psychology of Optimal Experience* (1990), posits that the elements that cause enjoyment are universal. People experience flow when they are totally immersed in the task at hand, which they are doing for its own sake without being concerned about rewards, difficulties, or dangers. Successful video games

create such a state for their players. In the language of educational psychology, these players have intrinsic motivation, which leads to high-quality learning and creativity (Ryan and Deci, 2000). Motivation is based on “social contextual conditions that support one’s feeling of competence, autonomy, and relatedness . . .” (ibid., 65). The feelings of self-determination, competency, and connectedness to a group are key conditions of video games’ potential “to lead to active and critical learning” (Gee James Paul 2003, 46). Despite common perceptions of gamers as antisocial loners, people play games for the interaction with other people (Sweetser and Wyeth, 2005). This is especially evident in MMORPGs, online games that can be played simultaneously by hundreds of thousands of people across the world. The virtual social and cultural worlds in these games are co-created by the players themselves who develop characters, life stories for their characters, alliances and wars among groups, and strategies to conquer other realms or to gain more power and money. In other words, much thinking, reading, and writing is involved in playing these games. It is by linking reading, writing, and thinking to these social and cultural worlds—the internal design of the game—by encouraging players’ to think in terms of patterns that are part of their own life experience, and by providing a network of people and tools, that good video games can fulfill their potential for active and critical learning. Players have to solve well-ordered problems, deal with a self-selected level of challenge, apply systems thinking, and are encouraged to explore and take risks because, after all, if they get shot, they can play again.

What makes a game engaging and enjoyable? Drawing from flow theory and literature on games’ usability and user experience, Sweetser and Wyeth (2005) developed a “GameFlow model” with eight elements considered key to achieve optimal experience in playing: concentration, challenge, skills, control, clear goals, feedback, immersion, and social. A game with these elements will keep players’ concentration by providing a high number of tasks that are challenging at a level that is still enjoyable and for which players have adequate skills. The tasks must have clear goals so that players know what they have to achieve, and they must be given feedback throughout so that they know when they have completed the game’s tasks.

How does this model translate into serious games? Clark Abt describes serious games as “having an explicit and carefully thought-out educational purpose and . . . not intended to be played primarily for amusement. This does not mean that serious games are not, or should

not be, entertaining” (Abt, 1970, 47). This educational purpose innately leads away from the flow experience because the players have an extrinsic motivation (Ryan and Deci, 2000) to play the game rather than playing it for its own sake. Nevertheless, even though extrinsic motivation is not as conducive to learning as intrinsic motivation, Ryan and Deci also state that extrinsic motivation can be brought closer to intrinsic motivation by promoting teaching strategies that foster students’ autonomy and self-determination, providing clear tasks that are within the breadth of students’ skills, and offering students a sense of belonging to a community. These elements will make students internalize and identify more strongly with a required activity, which will result in their higher willingness and interest in participating. Good video games seem to be better at creating these conditions than most classroom instruction.

Starting with the creation of the Serious Games Initiative, which focuses on applying gaming technology to management issues in the public sector, serious games have now gained the recognition of the game developing industry and credibility. Disappointed in the results of conventional training and recognizing the potential of video games as training tools, the U.S. military, the government, and the private sector have been investing heavily in developing video games for recruitment purposes and for employee training. America’s Army, the first game developed by the military in 2002 to help with U.S. Army recruitment, was made available for people to play free—and play it they did. The current version counts almost eight million registered players. Most recently the military developed the training video Full Spectrum Warrior, and released a part of it as a video game to use again as a promotional and recruiting tool.

Even without the U.S. Department of Defense’s budget to draw from, we still decided that an online game would be the best format of virtual instruction for our pedagogical goals and audience. We do believe in the medium’s motivating power, and, if the students are fully engaged in playing the game, the learning will follow.

### **Muckrakers: Playing the Game**

After agreeing that a serious video game would best engage our students outside the classroom and cognizant that production of video games can cost upwards of a million dollars, we decided to focus on the beginning module of our game, as opposed to creating it in its entirety. By creating one module, we would explore

the arena of serious gaming and evaluate and assess its feasibility for library instruction. During this time period we learned that James Madison University's Libraries and Educational Technologies department had been awarded a grant for more than \$150,000 from the Institute of Museum and Library Services (IMLS) to produce a series of serious games to develop students' health literacy and information literacy skills. Although at the start of our project we did consider the possibility of applying for a grant, we thought it more important to create a concrete prototype to show potential granting donors, while clarifying in our own minds what creating a game means.

As a scenario for the game we settled on the world of journalism, and *Muckrakers* was born. GWU's location in Washington, D.C., made journalism particularly attractive, as did the research component inherent to the field. Players begin as cub reporters at one of three competing D.C. area magazines that represent three different political perspectives: liberal, conservative, and independent. The differing perspectives and points of view tie directly back to our work with UW20, as those classes draw from current events and politics and are sometimes D.C. related. Players work individually at first and then in teams to compete for the feature story in their magazine's next issue.

This module's pedagogical goal is teaching topic refinement, one of the first objectives of our UW20 library sessions, including finding background information, creating research questions, identifying possible sources for information on the topic, searching for information, and locating sources. Each player within a team comes up with one story idea related to a D.C. topic. The team then chooses the best proposed story to bring it to the magazine staff meeting where the feature story idea will be chosen. The idea for the feature story is decided by group evaluation scores, which are then internally calculated, and the winning idea is declared.

### ***Evaluation***

The scoring of *Muckrakers* relies heavily on peer evaluation (as opposed to right or wrong answers) as well as players' autonomy, competence, and sense of connectedness to the group, all of which lead to increased motivation. This system does not require a time commitment for evaluation from either the faculty or the librarians. Students are involved in the research process in a larger context, they can rely on each other for feedback and scoring, and they can play the game independently of their level of knowledge. Grouping the players in teams,

which the game does automatically on the basis of their topic preferences, creates continuity with the collaborative learning that occurs in our classrooms. The group makes decisions about the final story idea or pitch, and teams also do the final evaluation. Teams are at the core of decision-making and evaluation, and one player cannot override the group. And students must rely on peer teaching as they prepare their pitches and look for information or how to gain more points. We have included no manual for how to play. As is inherent in games, many pieces are only available via exploration or discovery. Extra points can be accumulated by visiting the magazine's librarian and playing a logic card game based on narrowing topics. Players can also discover interesting links, information, and sources throughout the game.

Throughout the game, players will gather points by playing the game, meeting deadlines, and peer evaluation. Players will also be asked to evaluate their own story ideas by considering Evaluation Questions (Appendix 1), which are further reflected in the Pitch Evaluation Criteria (Appendix 2), which is used for evaluation of the pitches for the final story idea. At the end of the game, each team is given a certain number of points, based on the rank of their story idea, and each team member will be giving a percentage of the points of this rank, based on each team member's current score.

### ***Assessment***

Our original intention for *Muckrakers* was that faculty would ask students to play the game outside of class time as graded homework. Our challenge was to develop a game that would engage the students and make them want to play, not just for the grade reward (extrinsic motivation), but also for enjoyment (intrinsic motivation), which would increase their motivation and lead to better learning. But how were we going to test students' engagement and enjoyment? As Sweetser and Wyeth (2005) remark, until their article, existing literature on evaluating games tended to focus on elements other than players' enjoyment and engagement. Outside the game's internal peer evaluation, we needed quantitative and qualitative data to assess our module, for both library and grant writing purposes. In preparing for this assessment, we submitted our assessment strategy to GWU's Institutional Review Board (IRB), including an outline of our method of sampling the UW20 student population and our instruments: a pre-test, a post-test, and a script for conducting focus groups (Appendices 3 and 4). By drawing from Sweetser and Wyeth's article,

we adapted the GameFlow criteria to our assessment purposes. Given the experimental nature of our game, we were also interested in addressing some of our concerns regarding the game, such as its appeal across genders and majors to both game players and nonplayers, as well as its ability to engage the students (Appendix 3: Pre-Game Survey).

For our post-game survey we decided to use a modified Likert Scale with negative questions, with the intent that negative questions would garner more honest answers from our students and force them to think instead of blazing through the survey. These questions (Appendix 4: Post-Game Survey) focused solely on engagement and flow of the game and were also modified from Sweetser and Wyeth (2005).

Our final instrument of assessment was focus groups. Drawing from good experiences with focus groups at our library for feedback on web design, we thought that a focus group would allow us to get at the meat of how students perceived our game and how it could be improved. As we did further research into games and focus groups, we found that, among others, Kevin Keeker posits, “focus groups aren’t the best way to gauge the quality or popularity of your ideas. Instead, focus groups should be used to generate ideas for your game” (Keeker 2004, 212). Keeping this in mind we decided on eight prompts for our groups:

What games are you playing now? What aspects of those games do you enjoy?

What aspects of Muckrakers did you enjoy?

What aspects of Muckrakers frustrated you?

What did you think about the team work?

What did you learn by playing the game?

What do you think about using games for learning academic subjects?

How could we improve this game?

Where would you like the game to go from here?

Unfortunately, due to budgetary concerns, staffing restraints, and technological difficulties, we were unable to complete the assessment of our game. The technology to create a game did require that we hire outside expertise. With a limited budget of \$10,000, we drew from GWU’s Computer Science Department by hiring for the programming component a graduate student who had only limited experience with a project of this scope and had to concurrently learn the tenets of libraries and research. Despite our programmer’s optimism and can-do attitude, the project turned out to be too big for one programmer alone, as implementing the game technologically is time and talent intensive. After our

funds were depleted, we were without a programmer who could make the game playable, even if only for testing purposes. Unable to test our game with the students, as we originally intended, and faced with the decision of how to proceed, we showed the UW20 faculty what we had created. Up until this point, we had collaborated briefly with a faculty member who has a personal research interest in gaming and offers a UW20 class on the topic, but we had presented only the general concept and purposes of the game to the rest of the faculty. We received overwhelmingly positive comments and ideas about how we might tie it closer to the goals of the University Writing Program. This support of our efforts will help us as we look toward either writing grants to complete the project or approaching a partnership with another university’s gaming program.

## Conclusion

Even without a functional game at this time, we have not wasted our time. The experience of creating Muckrakers has raised interesting questions that deserve further exploration. What is the cost of creating a serious game for libraries and what is the shared value of such a game? How can we broaden our view of information literacy and critical thinking, which we too often cor- don off in the library context?

In this day and age, libraries are painfully aware of the cost of staying in business. With the price of materials constantly on the rise, the creation of an online game is a serious monetary and time commitment. An excellent online game, the quality of which is critical to engagement and motivation, can cost millions of dollars and libraries are rarely blessed with such extra funds. And how many instruction librarians would have to work full-time on said game? How much would the investment of multiple programmers, artists, and technological hardware and software cost? The ideal solution is collaboration among libraries. But our research shows that sharing learning objects, such as a serious game about research, is difficult (Parrish 2004). Libraries would want to modify it for their own setting and context, and once a learning object is stripped of its context, the time and money spent customizing it would not be cost effective.

The creative process of developing the game served as a reinforcement and betterment of our pedagogical purposes and methods within the classroom. As Bruffee stated, “understanding both the history and the complex ideas that underlie collaborative learning can improve its practice and demonstrate its educational value”

(Bruffee 1984, 416). As we created Muckrakers, we kept coming back to the heart of this matter. At each step of the creative process, we revisited information literacy, critical thinking, and the goals set out by our partnership with the UW20 faculty. This was our means of checks and balances. By immersing ourselves in this process, we came to understand how critical thinking has been defined by past educators, so that we can better translate critical thinking into the research classroom. While revisiting these topics helps us build environments that encourage learning, it also reinforces our behavior as teachers. We never came to a consensus about what information literacy and critical thinking meant, which only underlines the need for continual study to improve our practices. But more important, it made us consider information literacy and critical thinking in conjunction with teaching outside of the library environment.

Muckrakers has opened our eyes to how much we could explore within libraries about pedagogy, gaming, and technology. And, more significantly for us, it raised the question of how other libraries explore partnerships with other fields.

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## Appendix 1

### Evaluation Questions

1. How is your story idea related to your original story assignment?
2. Could a story on this topic support the mission of the magazine?
3. Why should readers of this magazine care about a story on this topic?
4. Could this story potentially address issues that will still be relevant to our readers in 10 years? What are those issues?
5. Could a story on this topic have an impact on the community?
6. How would you want your readers to react to a story on this subject?
7. What are some other issues related to this story?
8. Could you write an entire book to answer this question?
9. Why did you choose the sources you used?



## Appendix 2

### Final Pitch Evaluation Criteria

1. The story idea isn't related to their original assignment.  
Strongly Agree    Agree    Disagree    Strongly Disagree
2. A story on this topic would not support the *mission* of the magazine. [Hypertext link to the magazines' missions statements]  
Strongly Agree    Agree    Disagree    Strongly Disagree
3. This story idea doesn't take into account our magazine's audience.  
Strongly Agree    Agree    Disagree    Strongly Disagree
4. This story idea doesn't have the potential to be relevant to our readers in 10 years.  
Strongly Agree    Agree    Disagree    Strongly Disagree
5. A story on this topic would not have an impact on the community.  
Strongly Agree    Agree    Disagree    Strongly Disagree
6. A story on this topic wouldn't have the potential to get readers involved in their community.  
Strongly Agree    Agree    Disagree    Strongly Disagree
7. I can't see how this story idea could relate to other important community issues.  
Strongly Agree    Agree    Disagree    Strongly Disagree
8. This story idea is too narrow.  
Strongly Agree    Agree    Disagree    Strongly Disagree
9. This story idea is too huge for a magazine article.  
Strongly Agree    Agree    Disagree    Strongly Disagree  
[Explanation Box (required)]
10. I wasn't able to look up their sources because their notes were incomplete or incorrect.  
Strongly Agree    Agree    Disagree    Strongly Disagree
11. I feel that they could have come up with a better story idea from these sources.  
Strongly Agree    Agree    Disagree    Strongly Disagree
12. I would not have used these sources for this story idea.  
Strongly Agree    Agree    Disagree    Strongly Disagree  
[Explanation Box (required)]
13. Rank each of the pitches (except for your own) from 1 to 4 with 1 being the best.

### Appendix 3

#### Pre-Game Survey

1. What is your gender?
2. What is your prospective major? [Choices from pull-down menu]
3. How many hours a week do you play video games?
 

0	1–2	3–5	6–9	10+
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4. If you answered zero for question 3, skip this question and go to number 5. What types of video games do you play? *(Check all that apply.)*
  - First Person Shooter/Action (e.g., *Counter Strike*)
  - MMO (e.g., *World of Warcraft*)
  - Adventure (e.g., *Resident Evil*)
  - Driving (e.g., *Need for Speed*)
  - Puzzle/Logic (e.g., *Bedazzled*)
  - Role Playing (e.g., *Final Fantasy*)
  - Simulation (e.g., *Sims*)
  - Sports (e.g., *Madden*)
  - Strategy (e.g., *Civilization IV*)
5. Why don't you play video games? *(If you answered zero for question #3, you can hit submit after this question.)*
  - I don't like video games.
  - They are too expensive.
  - They are too violent.
  - I don't have time.
6. What appeals to you most when playing video games? *(Check all that apply.)*
  - Concentration: I like to concentrate on a task.
  - Challenge: I like to be challenged.
  - Skills: I like to master skills and move to higher levels
  - Control: I can control my reality.
  - Clear Goals: I like having a goal to achieve.
  - Feedback: I like to have regular feedback about my progress.
  - Immersion: I like to get lost in a game.
  - Social Interaction: I like to interact with real people while playing games.

## Appendix 4

### Post-Game Survey

On a scale of 1–4: 1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree

1. The scenario was not compelling.
2. The game overall did not keep my attention.
3. The tasks were too easy.
4. The game did not offer enough opportunities for exploration.
5. I did not like being part of a group.
6. The group evaluation was too complicated.
7. The pace of the game was too slow.
8. I did not feel rewarded for my efforts.
9. I felt that every step of the game was pre-ordained.
10. I would not keep playing other levels in the game unless I had to.
11. The game was not fun.