

## **Interactive Media as a Means of Attracting Prospective Freshmen**

An Interactive Qualifying Project Report  
submitted to the Faculty of  
WORCESTER POLYTECHNIC INSTITUTE  
in partial fulfillment of the requirements for the  
Degree of Bachelor of Science  
by

Kevin Nolan  
Chris Ramsley  
Steve Washington  
Mary Yovina

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Professor Dean O'Donnell, Major Advisor

## **Abstract**

This project studied the effectiveness of using Flash games to attract admitted students to Worcester Polytechnic Institute (WPI). The study involved the creation of two WPI-based video games, a multimedia website and a forum for discussing student experiences at WPI. We attracted admitted students through a demonstration at “A Closer Look”, an on-campus event for admitted students. Data concerning admitted student participation was collected and given to WPI Admissions.

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# **1. Introduction**

## **1.1 Problem Statement**

Generally speaking, WPI Admissions depends on the WPI community to give prospective and admitted students a view of WPI beyond the facts. WPI Admissions also depends upon the WPI community to give prospective and admitted students some fun while they visit campus. Gompei's Games intends to serve both of these purposes by providing admitted students with Flash games playable through the internet, and forums to discuss WPI with current students.

## **1.2 Goals**

The goals of this project are to aid WPI Admissions in convincing admitted students to come to WPI, rather than another school, and track the admitted student interest in student-made Flash games and forums.

## **1.3 Project Background: ARGs**

This project is the spiritual successor to two previous IQPs with similar goals: WPEye.net: An Alternate Reality Game for WPI Admissions and Alternate reality game for WPI Admissions. The biggest difference between those projects and this one is in method. The previous two projects used a type of game called an Alternate Reality Game (ARG) to attract admitted students to their website and forums to discuss things about WPI. An ARG, to put it simply, is a puzzle game that is played primarily through the internet where the puzzles are given in such a way that they seem real. ARGs are quite suited to creating a community and having players interact with each other, but there are some problems inherent in ARGs that make them less useful for attracting admitted students. The main problem with ARGs seems to be that most people don't want to participate in the type of puzzle that makes up most ARGs. In the past, ARGs have been only moderately successful, with only a handful of players each time. When we were deciding what to do to attract admitted students this year, we decided that ARGs were not the way to go.

## **1.4 New Approach: Flash Games**

Instead of ARGs, this year we decided to use a much more universal form of entertainment to attract admitted students. Flash games in general are games made with the Adobe Flash program. More specifically, Flash games are usually casual games that don't have much depth, but can be fun to play for a little while. We felt that casual games would be much more accessible to a wider audience of players, and would generate more interest for our site and WPI as a whole. In addition, Flash games have the benefit of only requiring one visit to play through, where an ARG is played over the course of several weeks or even months. We felt that this new approach would help attract more admitted students than in previous years.

## 1.5 Results

Though analysis of the goal of this project, namely attracting more students to come to WPI, is outside the scope of this project, there are a few things that came out of this project. First was the experience of Jen, the admitted student that spoke with us during the second A Closer Look. We feel that her decision to come to WPI might be based on speaking to us. We also had several people approach us and play our games at A Closer Look, but they didn't seem nearly as interested or committed as Jen. Our website data shows that we didn't have nearly the amount of traffic that we estimated we would receive, but there was enough traffic to show that there was at least some interest in our website. Unfortunately, the forums that we wanted to use as our primary method of communicating with admitted students showed little use, with no admitted students posting. This shows that just using Flash games does not make a website attractive to admitted students. People seemed to recognize our website from the Admissions email at A Closer Look, but for some reason very few people went on our forums. From the team's perspective, one of the greatest successes was the creation of two very good games. Playtesting data and observation of players has shown that both of our games are fun, and liked by many people. This shows that we are all capable of creating fun games, and are competent game designers.

## **2. Project Planning (B Term)**

### **2.1 Initial Six Ideas**

The first term of our project was the design phase for our games. Over the course of the term, we brainstormed six possible game ideas, intending to choose the best four and create those games in the next term. We designed games that were related to campus life at WPI, involving activities, places, and experiences known to all WPI students. We also wanted to achieve a few additional things with our games, and tried to design game concepts to meet these goals: we wanted to attract accepted students with entertainment (games), and therefore we wanted our games to be fun—independent of the references to WPI; we wanted accepted students to want to hear about WPI, and so we wanted our games to present information about WPI that was amusing, fun, and full of WPI personality rather than dry or commonly recited; and we wanted to use interest in our games to draw accepted students to our forums (e.g. at “A Closer Look,” catching the attention of accepted students).

Following the creation of the six ideas, we created a design document for each game in order to weigh each game against one another and choose the four best. Our design documents (see Appendix A.) included ideas for gameplay, specifics about player controls, a list of technical requirements, and a list of art assets, among other notes. Only “Build a Table for Your Dorm Floor” was eliminated before the creation of the design documents, due to a lack of direction for the game.

#### **2.1.1 NERF Wars**

“NERF Wars” is an action-shooter in which the player uses NERF weapons during the “NERF Wars” event which occurs at WPI. This game allows the player to choose from six weapons, character strengths, and strategies in a one-against-everyone-else environment. Set on the quad, the player must eliminate everyone else still playing and take back victory for his or her dorm floor. The game was designed to have a variable pace depending upon the strategy of the player, and appeal to those who like playing shooters.

#### **2.1.2 Build a Table for Your Dorm Floor**

“Build a Table for Your Dorm Floor” is a game set in the cafeteria in which the player must try to combine tables to create a large table with sufficient seating for all his or her friends from the dorm, taking care to not trap anyone by encircling them in tables or create obstacles for other students. This game was based on a common freshman year experience where a large group of friends, generally a dorm floor, would go to dinner together and need to combine tables into a large table.

#### **2.1.3 Race to the Campus Center**

In the racing game “Race to the Campus Center,” the player must get to the Campus Center for coffee before a quiz, avoiding the coffee zombies who haven’t yet had their morning coffee and are trying to keep you from getting in line in front of them. If threatened, the player can



deter coffee zombies by either going into stealth mode and acting like a coffee zombie, or giving a coffee zombie an energy drink to make him no longer need coffee and let you go. The game was designed to be a strategic but timed racing game, and was based off of the difficulty during breakfast- and lunchtime to get to the Campus Center before long lines formed.

#### **2.1.4 Activities Fair**

In “Activities Fair,” the goal of the player is to visit tables at the activities fair and gain points by collecting free stuff, such as pens, candy, and t-shirts, and signing mailing lists for clubs. The player must avoid “hazards” like Society for Medieval Arts and Sciences (SMAS) members boffing (fighting with foam-covered swords), the basketball-throwing robot at the robotics table, and blasting sound coming from speakers, and collect as many points as possible within a time limit. Activities fair was designed to be a platformer, with gameplay focused on collecting items. With this game, we were hoping to give players a glimpse at clubs and organizations at WPI.

#### **2.1.5 Gompei’s Gutters**

A puzzle game set in the campus bowling alley, “Gompei’s Gutters” is a game in which the player rolls a bowling ball through the entire alley to avoid obstacles and get a strike in the designated lane. The player must place pieces, such as pipes, ramps, and bumpers, to successfully get the ball from the launcher to the pins. The game was designed to be relaxing and require thought to complete, hopefully tapping into WPI students’ interest in problem-solving.

#### **2.1.6 DAKA Tray Sledding**

In the racing game “DAKA Tray Sledding,” the player uses disused trays from the cafeteria as makeshift sleds to slide down WPI hills. The player must avoid obstacles, such as trees, snowmen, thrown snowballs, and other sledders to make it down the hill in the allotted time. The game references the drawings carved into trays by students by allowing players to pick up powerups with names actually written on DAKA trays, like the “Tray of Judgment” and the “Tray of Doom,” which give the player the abilities to throw waves of snowballs and slow down all the other sledders, respectively.

### **2.2 Schedules**

We made up our schedule over the course of the first term to be as follows:

#### B Term

##### **Week 3:**

**Thursday:** Complete Design Doc 1: NERF Wars

**Saturday:** Complete Design Doc 2: DAKA Tray Sledding

**Steve:** Email Professor Lindeman, find out the information we need to start our site

**Week 4:**

**Thursday:** Complete Design Doc 3: Table-Building in DAKA

**Saturday:** Complete Design Doc 4: Activities Fair

**Steve:** Research technologies available

**Week 5:**

**Thursday:** Complete Design Doc 5: Race to the Campus Center

**Saturday:** Complete Design Doc 6: Gompei's Gutters

**Steve:** Mockup of website completed

**Week 6:**

**Prepare for Presentation**

**Week 7:**

**Make decisions about...**

- which games we're using
- what technologies we're using for our site
- specifics for personal milestones

C Term

**Week 1:**

Make Game 1

**Week 2:**

Make Game 2, Playtest Game 1

**Week 3:**

Make Game 3, Playtest Game 2, Fix Game 1

**Week 4:**

Make Game 4, Playtest Game 3, Fix Game 2

**Week 5:**

Playtest Game 4, Fix Game 3

**Week 6:**

Prepare for Presentation

**Week 7:**

Fix Game 4

D Term

**Week 1:**

Finalize all flash games if not done and bug-free

**Week 2:**

Get website with all working games up and running

**Weeks 3 – 5:**

- Maintain the website and our games
- Fix user-discovered bugs, troubleshoot, and fix game difficulties
- Gather feedback and data and maintain a presence on our site.
- Write Paper

**Week 6:**

- Write Paper

### **2.2.1 Initial Cuts**

Before beginning the creation portion of our project, we knew we were going to need to cut two of our games. The first two games removed from our project were “Build a Table for Your Dorm Floor” (“Table-Building”) and “NERF Wars.” We felt that the visions for these two were not as strong as those of our other games.

As we did not have a particular gameplay style chosen for “Table-Building,” we didn’t know if the game would be fun, or plausible to find a vision or feel for within the time constraints of our schedule. We let the idea go very quickly, knowing it was not something we could realistically accomplish.

“NERF Wars,” on the other hand, was a game that sounded very fun conceptually, as the activity itself is exciting and much of the gameplay, we thought, was interesting. However, coming up with a control scheme that would maintain fun gameplay proved difficult; gameplay would be slowed and frustrating with any weapon that could not be swung (e.g. sword, axe). Further discussion caused us to realize that there might be no fun in playing the finished product. The other issue with NERF Wars was the scope of needed features and assets—which included multiple control schemes and styles of fighting, an AI for opponents, and a large playing field with many obstacles—and how dependent the game’s completeness and fun was on such a large number of features. We then dropped “NERF Wars” and were left with the planned four games.

### **2.2.2 Workload**

We quickly found over the course of C Term that our schedule was far too rigid and unrealistic to finish and polish four games. The team’s unfamiliarity with Flash resulted in a significantly extended deadline for the first game made, “Gompei’s Gutters,” and an incomplete asset list in the design document caused more scheduling difficulties as more work than planned for needed to be done. Game 4 and eventually Game 3 were dropped because of the greater importance of quality than quantity.

We were able to learn from the problems with “Gompei’s Gutters” to improve both the design doc and the work schedule for “DAKA Tray Sledding,” but we were behind, and still had to continue working on the first game for the rest of the term. Additionally, after completing the games in C Term, the team still needed to use the break in between terms and the beginning of D Term to polish and playtest our games.

## **2.3 Initial Website Plan**

We did not start with a developed idea of our website. We had planned for it to be a place to host our games and link to our forums, and that we would include information about WPI which linked our games to our forums. Stylistically, it was blank, and it lacked cohesion. It was uninteresting, which would not attract students, but we were unable to come up with a way to make it interesting.

In an attempt to combine the pieces of our site, we attempted first to use a “fun map” of WPI which visitors could click on to pull up information about WPI, play animations of campus happenings, and find our games amongst the buildings of WPI. While the idea merged all of the pieces, the amount of work needed to complete it was again too great, and there still was very little to hook visitors or spark their interest in WPI.

## **3 Game Creation (C Term)**

### **3.1 Gompei's Gutters**

Gompei's Gutters was the first game that we implemented, and what we thought would be the easiest out of all of our games to implement. Initially called Ridiculous Bowling, the name was changed to Gompei's Gutters after we realized that the game wasn't nearly as ridiculous as we first thought it would be. We also couldn't fit the longer title on our title screen.

#### **3.1.1 Design Decisions**

##### **3.1.1.1 Cut Features**

In the first meeting at which Gompei's Gutters was mentioned had a much more ambitious plan for the game than was actually implemented. We initially intended it to be far more Rube-Goldberg-esqe, with elaborate mechanisms bringing the bowling ball all over the Alumni Gymnasium building. We also had plans for multiple balls on certain levels, where the player would have to get a strike in two different lanes at the same time in order to complete the level. Basically, we were trying to make the game live up to its original name of Ridiculous Bowling.

Gompei's Gutters was initially supposed to have far more pieces in it than it does right now. The initial design doc specifies a "FullPipe" piece that would take up two adjacent spaces and turn the ball back the way it came in the next tile over. This piece was actually implemented in an early version but we decided to cut it because it wasn't included in any of our level designs as it didn't really serve a purpose that wasn't done by other pieces. We also had ideas for slides and lifts that were never implemented because of our decision to restrict play to the lanes themselves, rather than the rest of the building. We also wanted to have much more in the way of obstacles, such as vending machines, chairs, and the like, but time restrictions forced us to limit ourselves to the holes that are currently in the game.

The biggest reason that we had so few features to cut was that we didn't try to be too ambitious with our design. We wanted the fun of the game to be in the puzzles, rather than in the mechanics. Because of this, we had a small number of more important mechanics, rather than a large number of extraneous ones.

##### **3.1.1.2 Added Features**

While we were making Gompei's Gutters, we discovered through testing that we had missed several important features that made the game quite a bit better. First of all was our inventory sidebar. In testing, we found that some people had trouble with our original sidebar, which involved a grid with no spaces between the different pieces. People found this confusing, so we changed it to be a bit similar to the inventory sidebar to a game called Electric Box. The current sidebar has white rounded squares around each place that pieces can go. This was a great improvement, and helped our interface a lot.

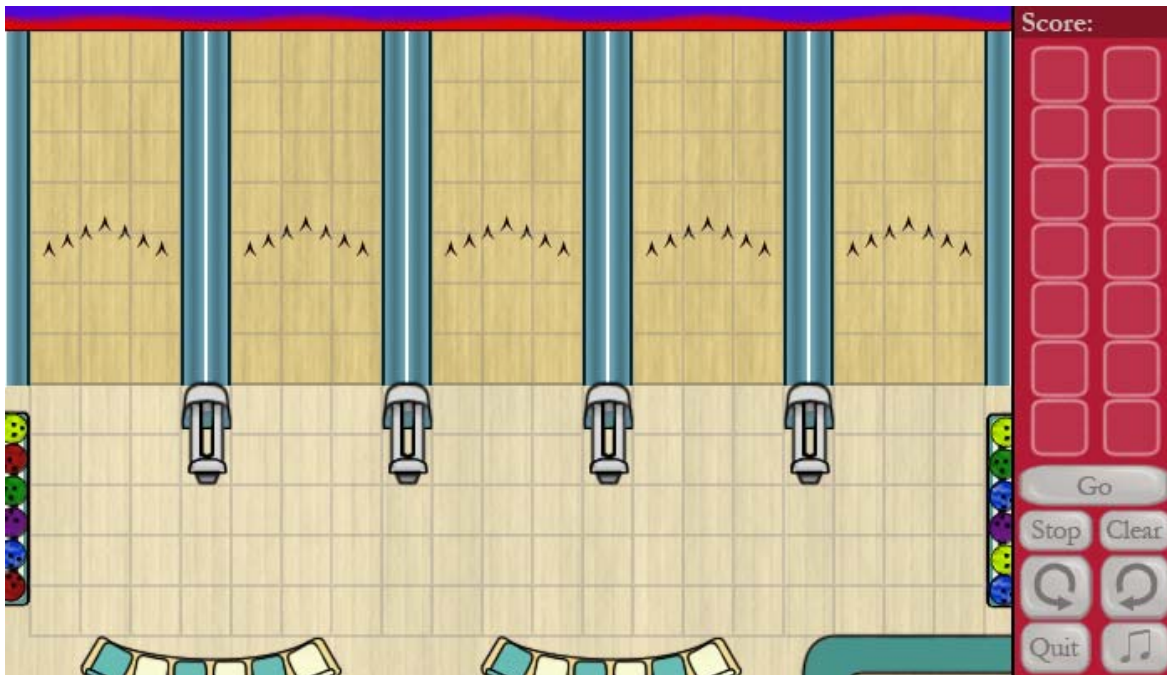
Another improvement that we made that wasn't in the original design document was the message that appears when the player fails to get a strike after launching the ball. We added this message to make it clear to the player what happened, rather than just making the ball disappear.

We found through testing that the instructions screen that we had was not enough to tell the player what each piece did, so we implemented a tutorial system where a series of text balloons would tell the players what each piece did. This vastly improved player experience more than any other feature that we added after testing. This increased player confidence and helped people get into the game more easily.

The final feature that we added that was not in the original specification was the level select. We realized while testing that it became quite annoying to play through the whole game to get to a specific level, even if the solutions to each level were already known. We implemented a level select that would save the current level and score to the player's machine, so that they could come back and keep going from where they left off.

### 3.1.1.3 Art

The decisions for the art style of Gompei's Gutters were made with regard to the type of gameplay offered by the game. As the game is a puzzle game where positioning pieces is extremely important, we knew that having a grid would be necessary for the player to line up pieces without frustration. Therefore, the game grid dictated the art be modular and have very specific size requirements, and also, style-wise, have defined pieces with importance given to line. The grid went sensibly with clean, crisp shapes and lines. Essentially, we used the art style to emphasize the functionality and modularity of the pieces.



(Figure 3.1.1.3-1) The background image for "Gompei's Gutters."

As for color choice, a lot of attention was paid to the interior of the campus bowling alley as well as the school colors, crimson and grey. WPI's school colors were used in menu elements and for the pieces (e.g. the ball launcher, the pipe, the ramp), though the official colors were tweaked a bit to be more visually appealing when set against one another. The bowling alley on campus was of course an important reference for the creation of the digital version, but it was not reproduced faithfully, in order to allow for significant space for puzzles, and to keep the environment from appearing cluttered.



(Figure 3.1.1.3-2) The pieces to be placed on the grid in Gompei's Gutters.

### 3.1.2 Postmortem

#### 3.1.2.1 What Went Wrong

The biggest issue that we had with Gompei's Gutters was poor time budgeting. We felt that we would be able to implement each of our 4 original ideas in one week each. This proved totally impossible. Gompei's Gutters took a total of about 8 weeks to finish. We had no idea how big of a project we were getting into when we started, and we kept running into unexpected bugs that took much more time to fix than we expected. Our biggest bug involved and incompatibility between our placeholder art and the final art which cause a number of collision bugs that took over a week to figure out and fix. Were we to do this project again, we would give much more time to each game so we would not be surprised when it takes us over a month to do.

The next thing that we would do differently involves Flash. We did not do much research into ActionScript programming before starting this project, and we really should have. One problem that we ran into quite often was that we didn't know what we needed to do in the code to produce the effect that we wanted when we started the project. We also had problems importing animations, as we didn't know what file types were best for Flash, and what was needed to correctly import animations. Thankfully, we were able to use object oriented programming to lessen some of the burdens that we had, but we could have done much more in the time given had we known ActionScript before we started.

One art specific problem that we had was one of scale. When we first wrote the design document and made sketches for what the game should look like, we anticipated being able to use a much finer level of detail than we were able to. This caused some issues where detail was not able to be drawn in or seen, and forced us to sometimes change designs.

#### 3.1.2.2 What Went Right

The most prominent thing that we did right for Gompei's Gutters was that the game was quite fun according to almost everyone that played it. Our puzzle design had enough difficulty to challenge people, especially if they wanted to find the optimal solution to each level. Our tutorials and early levels helped even non-gamers learn our game quickly and successfully. A

game such as this is made by its puzzles, and we had puzzles that were fun to solve and fun to watch.

Another thing that went well was how well we responded to playtesting comments. The best example is our tutorial system, which we thought was unnecessary at first due to our emphasis on player experimentation. We felt initially that players would figure out what each piece does by experimenting with it, but it became obvious through testing that players didn't want to experiment with the game that way before they felt more comfortable with how the game worked. Because of this, we added a tutorial that explained very clearly what each piece did, allowing players to be eased into the game and enhancing the experience.

## **3.2 DAKA Tray Sledding**

### **3.2.1 Design Decisions**

The intention of DAKA Tray Sledding was to create a very casual, easy to get into, quickly completed game that doesn't require a lot of higher level thought, and that presents a positive image of WPI. We decided a simple racing game, where the player races against the clock rather than other people, would fit these parameters nicely. It has a sense of speed to it, making sure the player doesn't feel like it's going to take a while, and though there are other sledders on the hill in the game, we wanted to emphasize friendly competition, so we chose to have them only act as obstacles, not opponents.

Further design was simple. We chose to have a few different obstacles, including trees, snowmen, other sledders, and slalom gates, the last of which the player could go around in the right direction to get time taken off the ever-increasing clock. This provided two static obstacles to avoid, a moving obstacle, and an obstacle that could also be beneficial. We also wanted to include power-ups, to give the player something to aim for, rather than away from.

#### **3.2.1.1 Cut Features**

We had initially planned to have other sledders move intelligently, but we ended up leaving them moving in straight lines only.

We planned to let the player throw snowballs, but we wanted to avoid the feeling of a shooter, and just moving was a challenge enough, so we dropped the idea. Because we dropped the idea of throwing snowballs, the power-up that allowed the player to throw in all directions instead automatically did so for a short time.

We also planned to end each level by having Gompei come out and hug the player, but it was an unimportant feature, and we decided to just have a finish line instead.

We planned to have a high score board on our website, but we ended up with simply a final score display at the end, with no relation to past games or other players.



### 3.2.1.2 Added Features

We had initially planned to make movement speed constant, but in order to make the game feel more like sledding, we implemented acceleration and deceleration, so that the player takes time to speed up, and slides to a stop.

We had not initially planned on having specific levels, but rather one replayable level. We later decided to change this to a series of seven levels, while progressively adding components at each new level. Each of the levels also now has a goal time, where if a player does not finish in that amount of time, that player must retry the level.

The placement of obstacles went through a few versions before we found something that worked with our final movement system and object sizes. We ended up with much fewer objects that were a bit larger than the initial tests, at somewhat regular intervals.

Likewise, the length of levels was not determined at the start, and we tried of few different lengths, but we ended up with levels that take about a minute each.

### 3.2.1.3 Art

The intended look of the art for DAKA Tray Sledding was decided upon with two desired results in mind: to achieve a more “organic” look which juxtaposed the sleek and modular feel of the art in Gompei’s Gutters, and to maintain a cheerful atmosphere. The other important element to the look of DAKA Tray Sledding was the incorporation of DAKA Trays and the carved-in drawings seen on them.



(Figure 3.2.1.3-1) The options menu, a tray with carved-in text, from DAKA Tray Sledding.

In creating the organic look for the game, the rough, scratched in drawings on DAKA trays had a significant influence on the drawing style. In this way, the art assets in the game also look hand-drawn. This style choice also created consistency between all elements of the game. Another desired effect that led to a more organic look was to create the soft, wintry look of being outside in the snow on an overcast day.



(Figure 3.2.1.3-2) Objects that appear on the trail in DAKA Tray Sledding.

In order to maintain a cheerful atmosphere, fairly saturated color was used in any place that was sensible, making the sparse color in a mostly snowy environment stand out. Additionally, the player character was designed with cartoon and casual game influences, particularly with Nintendo's Mii avatars in mind. All of the sledders were also designed to be as convincingly androgynous as could be achieved in so few pixels, in order to appeal to both male and female players, or at least not exclude any gender.



(Figure 3.2.1.3-3) The player character and non-player characters in DAKA Tray Sledding.

### 3.2.2 Technical Aspects

DAKA Tray Sledding was designed to be very simple, with a single frame in a Flash movie timeline running the whole game, save menus and splash screens. During each level, content is randomly generated, based on simple parameters, and at the end of each level, all objects are cleared, and the game is initialized again with new parameters. Throughout the game, everything takes place in one small area. To the player, it looks like he or she is moving down a hill, but really, the player only move around the screen as objects are created at the bottom, progressively moved up to the top, then deleted once they are off screen. Thus, only the few objects that are on screen need to be kept track of, and loading levels is extremely easy.

The code, though easy to follow for a person, is not perfectly efficient, and it spends a lot of time looking through the list of every object on screen to check for collisions, but since the number of objects is limited, this style allowed for quick implementation without any performance hits. Similarly, not all obstacles are hierarchical, and checks against a few types when a collision occurs are usually necessary. However, many obstacles are hierarchical, and the few categories that they fall into are distinct enough that separate code for handling each was not a problem.

### 3.2.3 Postmortem

What went right:

- Having learned a little about Flash on the last game, this one started off a bit faster.
- The Shootorial from Kongregate got things started even faster, with an example of how to basically set up a game like this.
- Starting work on this game early, while the other was in development still, helped it actually get done.
- Generating obstacles on the fly, rather than with preset patterns, allowed for a lot more levels without much effort: with a few tweaked numbers, the whole level can be changed.
- The acceleration-based movement combined with the trail the character leaves behind make it really feel like sledding.

What went wrong:

1. A lot of things were missing from the initial design because we hadn't thought of them, and we ended up cutting a reasonable amount. We had to have some extra meeting and discussions to figure things out.
2. We were pressed for time, and didn't get to test as much as we would have liked.

Conclusion:

Overall, the game went well, and even though a lot was changed from the original design, the changes were mostly for the better. The basic system was simple enough to be implemented in a short amount of time, though some of the details were more complicated. We dove into the game without a lot of Flash experience, but using a tutorial to get the first little bit was extremely helpful. In the end, we got a complete, working, fun game made.

## 4. Going Live

### 4.1 Surveys and Beta Testing

After the games were mostly complete in the beginning of D-Term, we started the next phase of development. By this time we had already informally tested both games with friends and other IMGD majors working in the IMGD Lab (Fuller Labs 222). However, the main component of Beta Testing was conducted through the use of surveys taken at SurveyMonkey.com

We set up two surveys on SurveyMonkey, one for each game. Both surveys contained the same questions, and they were separated so we could know which game was being tested. Because of the limit of SurveyMonkey.com free accounts, each survey contained 10 questions, though some were compound questions so we could get more information out of the survey. Each survey had 5 general questions about the person taking the survey, and 5 that were related to the game being tested.

#### Survey for DAKA Tray Sledding and Gompei's Gutters

- **General Questions (Page 1)**
  - How old are you?
  - What is your Gender (choose one: Male/Female)
  - In an average week, how often do you play video games?
  - Do you play Flash games online? If so, how often?
  - List a couple of your favorite video games, if you have any (these can include computer games, console games, hand held games, or any other games you play)
- **Game Specific Questions (Page 2)**
  - Were the instructions for the game clear? Was there anything that you felt could be explained better?
  - Was there something about the game you particularly liked or disliked?
  - If you could change anything about the game, what would you change?
  - How difficult was this game? (choose one: Very Easy/Easy/Medium/Hard/Very Hard)
  - Did you feel frustrated with this game? If so, when/why?

We put a link to each survey on the page for the respective game, and then invited people we knew personally, focusing on friends of ours who were high school seniors, and thus the target audience for our games. They were contacted through virtual means: email, messages on Facebook, and instant messaging. Over the next few weeks we collected responses and took the suggestions given and tweaked the games accordingly.

The survey for Gompei's Gutters received twelve replies, and several changes were made to bowling in light of them, including changing the tooltip text to better explain how pieces worked, as well as changing some of the sounds in the game. Given the time constraints and the original vision of the game, a video (or otherwise visual) tutorial could not be made, though it

was a viable suggestion given by one of the testers. Also, several bugs having to do with score reporting and object placement were addressed.

Eight people replied to the survey for DAKA Tray Sledding. During beta testing our team added several elements, including powerup indicators, more distinguished snowballs, and a “trail” to follow the sledder. There were also several replies that players did not understand the effect of the Tray of Doom, and thus art assets were added to indicate that enemy sledders were affected (by adding a blue overlay to the normal enemy sledder art). Also during beta testing, several sounds were added. The sounds were on the plan to be in the game from the start, but they had not been implemented and we decided to beta test the game without them at first. Finally control bugs (i.e. the sledder steering even after the button was released), were addressed and fixed for the final release.

## **4.2 Organization**

### **4.2.1 Website Design**

At the end of B-Term, as we were finishing up all of our design documents, the group started to design a website for the IQP. Along with hosting pages for the games, we also wanted the site to provide information about WPI for prospective students to see, and to lead them to choose WPI. We made a mock-up of the website, which included pages for the flash games, along with a cartoon map of WPI, which we called the “Fun Map.” The original plan was to have the Fun Map have rollovers of certain buildings, which would provide information on the building, and other buildings would be links to the games (The gym for Gompei’s Gutters, the Hill for DAKA Tray Sledding, the Campus Center for The Race to the Dunkin’ Donuts, and the Quad for the Activities Fair).

In conjunction with the various blurbs of information about WPI, we also wanted to implement forums for prospective and admitted student to post questions about WPI to and to talk about the game or WPI in general. It would be moderated a patrolled by our group, and other WPI students, who would be there to answer any questions the players had about the school. To encourage players to sign up for the forums, we had planned to implement a high score system into the games, which would save each player’s high score to their profile. In order to access their profile to save their scores (which was optional) the player would log in to our site with the same login as they had used for the forums.

The plan for the forums was to have a main forum called “General WPI Talk” for just that. Inside that forum would be a subforum called “The WPI Experience,” which contains articles on different aspects of WPI life, which forum users could reply to to either ask questions or expand upon the topic. There were two other forums besides “General WPI Talk,” which were mostly meant for website and game maintenance: “Game Comments/Suggestions” and “Bug Reports.”

## 4.2.2 Website Development

At the end of B-Term, we requested space on the IMGD server from Michael Voorhis, the System Administrator for the Computer Science Department at WPI. He was able to get us web space on the Alpheus server (also known as imgdweb) along with PHP access and a MySQL Database, which was to be used for our own Database usage (the site's login) and for our boards to use. The address for the site was <http://imgdweb.wpi.edu/~svw/>.

The first iteration of the site was developed in C-Term using our original design, using place holders for a header graphic, and the Fun Map. A simple register/login/logout system was implemented using PHP, MySQL, and browser cookies. For most of C-Term, the group's focus was on developing the games, so site development was pushed off until the end of the term.

At the end of C-Term, we set up a more concrete structure for the site in code, along with making the decision to get rid of the login system on the main site, citing security and usability concerns. We also installed the phpBB<sup>1</sup> forum system on our boards, and changed around the look and feel to match WPI's colors. We also added functionality to the games so that scores the each player scored would be sent to the MySQL database, allowing us to have another set of data to track about the players.

## 4.2.3 Website Struggles

At the end of C-Term, the site started to pull together, though the Fun Map still was not there. But the structure of the site around the Fun Map was coming into place. When the site came to a fairly presentable level, we decided that we should try to get a more human-readable web address. We looked for a suitable solution, and it came up in the form of WPI's Short URL Request form.<sup>2</sup> A request was put in right before the end of C-Term for us to have the URL <http://www.wpi.edu/+gompeisgames>.

Come D-Term, we had found that the request for our Short URL Request was denied because our site heavily used PHP, which WPI was in the process of removing from its servers due to security flaws inherent in PHP itself. However, since a major part of tracking for our project (the forums) was based in PHP, we sought out Michael Voorhis to request an exception be made for our project.

Over the next several weeks we were bounced between Mark Claypool, Michael Voorhis, and WPI's Computing and Communications Center (CCC) in order to try to get an exception. Except for Mark Claypool (who we found out was not one of the people who we should talk to), all involved were worried that our group would not maintain the forums. In the future, our old forums would be left wide open to attacks on WPI's servers.

We agreed to keep updating the forums (a trivial task) and removed any other PHP from the site (including removing the PHP that updated the database with scores from the games). We

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<sup>1</sup> <http://www.phpbb.com/>

<sup>2</sup> <http://www.wpi.edu/Pubs/Policies/Web/url-request.html>

presented the site to Michael Voorhis who said the site met his standards, and submitted another Short URL Request to the CCC, the ones who would actually grant the URL to us.

After a week, we went to the CCC and inquired about the status of our request. We were told that even though we had gotten rid of PHP on the main site and offered to maintain the forums, our request was denied. At this point, we were told that Alpheus, the server where our site was hosted, was not owned by the CCC and thus could not be linked to via Short URL. We were back at square one with our still unreadable URL.

However, Michael Voorhis, after talking with Dean and coming to an understanding, was able to get us a human readable URL. In exchange, we got rid of the forums hosted on our site, and asked the Game Development Club if we could have some space on their forums, which they readily agreed to and helped us out a lot in developing it. This change was accepted by Michael, and he set up a URL for us, which was arguably better than the Short URL the CCC would have given us: <http://gompeisgames.wpi.edu>.

#### **4.2.4 Website Design Changes**

At the beginning of D-Term, we decided to set the date our site would go live. Since the main event our site was centered around, A Closer Look, was set for April 15<sup>th</sup>, we decided to have our site up by April 8<sup>th</sup>. As that date came closer, website development had fallen behind, mostly because of the Fun Map. Our group underestimated the level of detail required for the map, and left too little time to create one. As a last minute decision, we changed the design of our site completely to mimic a newspaper, namely WPI's newspaper "The Towers." This got rid of the Fun Map completely but still allowed for easy insertion of information about WPI (used as articles in the "newspaper"). We quickly came up with a 3 column format and had the structure in place by April 8<sup>th</sup>. Before and during the first week the site went live we developed small blurbs about various parts of WPI and posted them to a special part of our forums.

**Home**  
[Return to the Front Page](#)

---

**Gompei's Gutters**  
[Play Gompei's Gutters!](#)

---

**DAKA Tray Sledding!**  
[Play DAKA Tray Sledding!](#)

---

**Forums**  
[Visit our Forums!](#)



**GAME:GOMPEI'S GUTTERS**

Gompei's Gutters offers the full joy of bowling at WPI's on-campus bowling alley (also called Gompei's Gutters) and then some! Adding ramps, bumpers, and pipes to the experience, Gompei's Gutters is a ridiculous bowling game that is sure to delight.

[Go play Gompei's Gutters now!](#)



**THE WPI EXPERIENCE**

Learn more about the WPI Experience in our forums!

[Click here to go to the forums!](#)

Couldn't make it to "A Closer Look" @ WPI? Check out some of the videos below to catch a glimpse of what happened and see what you can do at WPI!

- [Presentation on the Interactive Media and Game Development \(IMGD\) Major](#)
- [A short tour of the Activities Fair](#)



**GAME:DAKA TRAY SLEDDING**

Take one part tray, one part snow, and three parts fun, mix them all together, and what do you get? You get DAKA Tray Sledding! This game brings the enjoyment and exhilaration of careening down a hill at high speed equipped only with a lone dining hall tray. A fast and furious game that you can't tear yourself away from!

[Go play DAKA Tray Sledding now!](#)



There are lots of clubs on campus to join with fun events to go to!

**About DAKA**

It is possible to 'win DAKA' by being part of the last group of people to leave DAKA when it closes at night. This is related to the Ultimate DAKA Challenge, which is when a group of people is the first to get into DAKA in the morning when it opens, stays the whole day, and then leaves last.



**About The 17 Hour Workload**

The easiest way to estimate how much time you will actually need to spend in a course is by finding out how much of the work is project work. It takes much more time to do a project well than it does to do a homework well. Even though professors give more time to complete projects than homework, they are more often than not conservative in their time estimates.

[Read more](#)

(Figure 4.2.4-1) A screenshot of the final website design.

## 4.3 A Closer Look

### 4.3.1 Preparations

Earlier in the project, we decided that the project should have a presence at both "A Closer Look" days. This would provide the project with more exposure to prospective students, and it gives the students a feeling that they are able to look straight into the life of a WPI student, as opposed to the view of the school that Admissions presents.

With this in mind, we endeavored to get a presence at the Activities Fair occurring on both Closer Look days. We requested a table from Kaitlin Gentile from Admissions that would allow us to showcase our games and website to families of prospective students as they passed by. It was our hope that this exposure would bring more people to the website, to play our games and look at our forums.



At the same time, we met with the Academic Technology Center with the idea of doing a live webcast of select portions of A Closer Look: The IMGD Presentation and the Activities Fair. After a short meeting instructing us on how to stream from a video camera connected to a laptop, we proceeded to gather our supplies: four laptops (two for each game), one laptop especially for streaming video, a video camera and tripod, and a fire wire cable.

#### **4.3.2 At “A Closer Look”**

The day of “A Closer Look” we set up our camera in Perreault Hall ready to record the IMGD Presentation for the people watching at home. At the same time, Steve used his Twitter account to broadcast information about the streaming video (which was propagated by other Twitters). The IMGD Presentation mostly consisted of a presentation of some of the 2008-2009 IMGD Major Qualifying Projects, along with short segments from Professors Claypool, O’Donnell, Lindeman, and Rich.

After the presentation we moved to Harrington Auditorium, where we set up the four laptops on the table provided. Since our table was near the entrance and on the way to lunch for the prospective students, our games got a lot of exposure and a few people came up and played our game. Even more people saw our table and commented about the site, even though they did not play the games. The second week we handed out cards with the URL of the site to give out so the students could remember the site after they left.

The second Closer Look day, April 22<sup>nd</sup>, we thought it would be a good idea to walk through the Activities Fair and take a video of several different groups that had set up on the Quad. After a few technical difficulties, we got a short video about many of the groups, though that video was cut short due to rain. That video, and the video of the IMGD Presentation that day, were linked to on the website so students who were not able to make it to campus for A Closer Look would still be able to experience parts of the day.

Overall, we were able to generate interest in a few accepted students at the event. Notably, an accepted student named Jen told us that after seeing the IMGD presentation, she wanted to major in IMGD. She played our games and talked with us for a long while, and she expressed a lot of interest in becoming an IMGD major at WPI. While we can’t guarantee that she will certainly choose WPI and choose to major in IMGD, what was said at least indicated that she had a strong desire to do so, and that we had a significant impact on her decision.

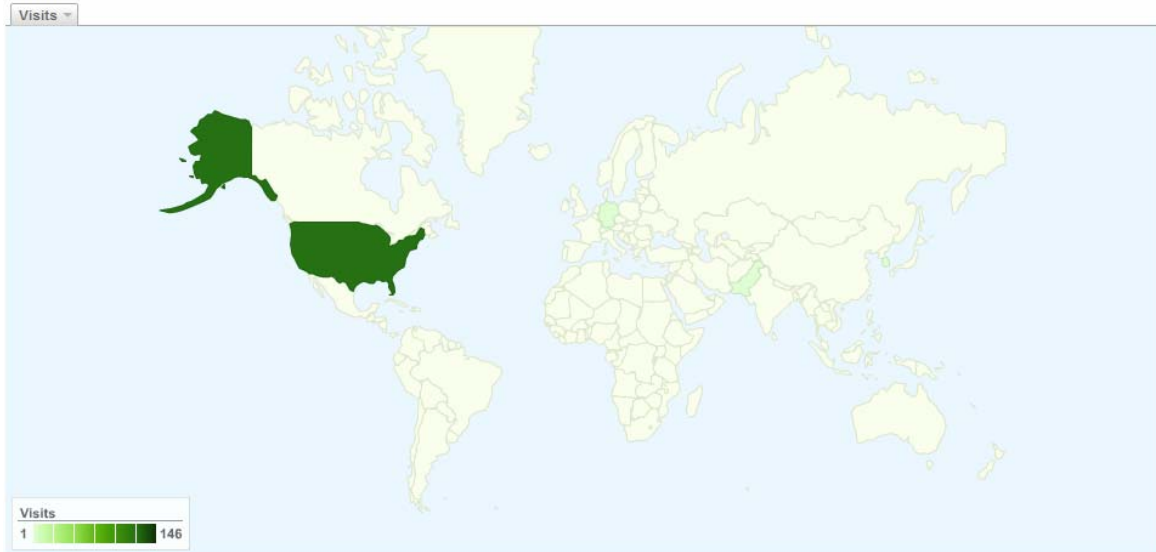
## **5 Conclusions**

### **5.1 Site Statistics**

#### **5.1.1 Gompei's Games Website Statistics**






Over the course of several weeks, we collected data on visitors to our site. While most of the visitors came from Massachusetts (which is also where a large number of prospective students come from), there were a sizable number of hits from other areas in New England, the United States, and even across the globe (including hits from Germany, Pakistan, and South Korea (See Figure 5.1.1-1).

We used Google Analytics to collect our data, starting on April 8<sup>th</sup>. However, since launch, we have had to access the site from various computers and fix different issues that popped up, as well as get certain parts of the site ready for special presentations. Knowing this issue, and that Google Analytics could not exclude our visits, we realize some of the data (especially time on site) is altered by our own visits. We kept this in mind while analyzing our data so that patterns can be observed, but cautiously and with careful tracking of our own site usage.



**149 visits came from 4 countries/territories**

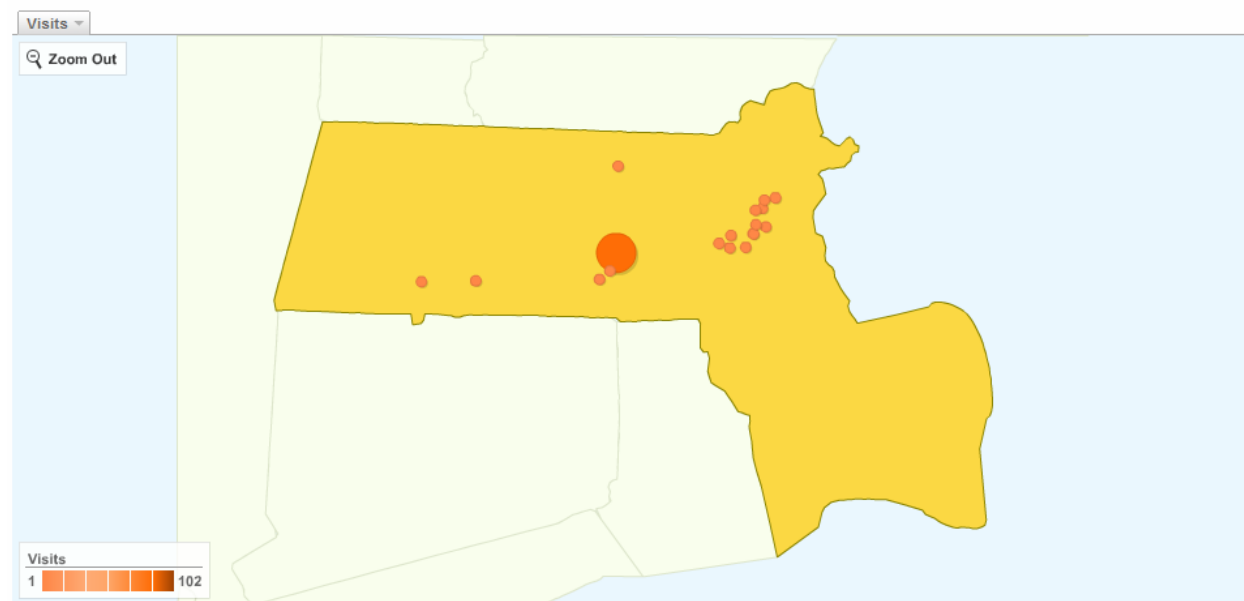
Detail Level: City | Country/Territory | Sub Continent Region | Continent Dimension: **None**

Site Usage		Goal Conversion		Views:   		
<b>Visits</b> <b>149</b> % of Site Total: 100.00%	<b>Pages/Visit</b> <b>3.95</b> Site Avg: 3.95 (0.00%)	<b>Avg. Time on Site</b> <b>00:05:14</b> Site Avg: 00:05:14 (0.00%)	<b>% New Visits</b> <b>63.76%</b> Site Avg: 63.09% <b>(1.06%)</b>	<b>Bounce Rate</b> <b>38.26%</b> Site Avg: 38.26% (0.00%)		
Detail Level: <b>Country/Territory</b>		<b>Visits</b> ↓	<b>Pages/Visit</b>	<b>Avg. Time on Site</b>	<b>% New Visits</b>	<b>Bounce Rate</b>
1.	<a href="#">United States</a>	<b>146</b>	4.00	00:05:20	63.01%	37.67%
2.	<a href="#">Germany</a>	<b>1</b>	1.00	00:00:00	100.00%	100.00%
3.	<a href="#">South Korea</a>	<b>1</b>	3.00	00:01:06	100.00%	0.00%
4.	<a href="#">Pakistan</a>	<b>1</b>	1.00	00:00:00	100.00%	100.00%
Find Country/Territory: containing <input type="text"/>		Go		Go to: <input type="text" value="1"/>	Show rows: <input type="text" value="10"/>	1 - 4 of 4  

(Figure 5.1.1-1) Map overlay of the globe. Darker green means more hits.

## State Detail: Massachusetts

Apr 8, 2009 - Apr 26, 2009



This state sent 121 visits via 18 cities

Detail Level: City Dimension: None

Site Usage		Goal Conversion		Views: [Grid] [List] [Map]		
<b>Visits</b> <b>121</b> % of Site Total: 81.21%	<b>Pages/Visit</b> <b>4.26</b> Site Avg: 3.95 (7.88%)	<b>Avg. Time on Site</b> <b>00:05:37</b> Site Avg: 00:05:14 (7.34%)	<b>% New Visits</b> <b>56.20%</b> Site Avg: 63.09% (-10.92%)	<b>Bounce Rate</b> <b>39.67%</b> Site Avg: 38.26% (3.70%)		
Detail Level: City		Visits ↓	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
1.	Worcester	102	4.66	00:05:46	52.94%	37.25%
2.	Wellesley	2	1.50	00:00:08	0.00%	50.00%
3.	Saugus	2	3.00	00:15:47	50.00%	0.00%
4.	North Oxford	1	1.00	00:00:00	100.00%	100.00%
5.	Waban	1	1.00	00:00:00	100.00%	100.00%
6.	Brookline	1	8.00	00:04:35	0.00%	0.00%
7.	Indian Orchard	1	1.00	00:00:00	100.00%	100.00%
8.	Brookline Village	1	3.00	00:15:54	100.00%	0.00%
9.	Auburn	1	2.00	00:00:36	100.00%	0.00%
10.	Boston	1	2.00	00:00:03	0.00%	0.00%
Find City: containing		Go	Go to: 1	Show rows: 10	1 - 10 of 18	

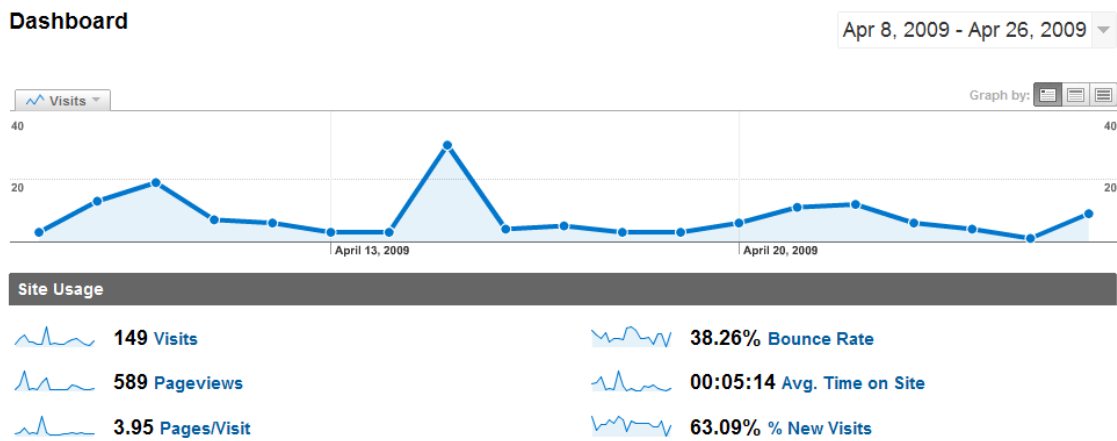
(Figure 5.1.1-2) Map overlay of our most popular state, Massachusetts

Though we had planned for our site to be live on April 8<sup>th</sup>, the Admissions Office had not sent out word of our website to their mailing lists of prospective students. It seems from the data provided that they sent out the notification of our site on April 10<sup>th</sup>, as there was steadily low

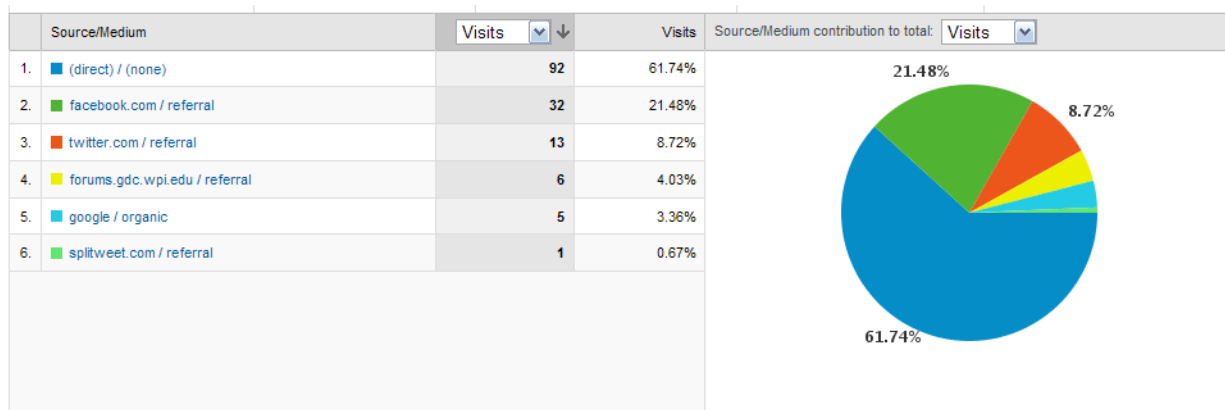
traffic until that date, and then a rise in site traffic occurred. From then until April 15<sup>th</sup>, the traffic to our site was steady.

On the day of April 15<sup>th</sup>, the site saw a large spike in activity, which can be mostly attributed to the use of Twitter. During the IMGD Presentation Steve posted an entry advertising the live webcast<sup>3</sup>. About halfway into the presentation, another Twitter account (called “W\_P\_I,” which posts entries about the latest happenings at WPI) reposted Steve’s entry<sup>4</sup>. The end result was at least 200 people seeing the link and a large fraction of those came to see the site and presentation.

The next week showed a steady flow of visitors, with a smaller spike on the day of April 22<sup>nd</sup>, the second Closer Look. This smaller audience may be due in part to the fact that Steve posted another entry to his Twitter about the live webcast, but it was not broadcast. This second steady flow was slightly higher than before A Closer Look, showing that our presence at the Activities Fair helped promote our site.



(Figure 5.1.1-3) Graph of overall visits to <http://gompeisgames.wpi.edu>.



(Figure 5.1.1-4) Chart of highest referring sites to <http://gompeisgames.wpi.edu>.

<sup>3</sup> <http://twitter.com/esaevian/status/1525846434>

<sup>4</sup> [http://twitter.com/W\\_P\\_I/status/1526009552](http://twitter.com/W_P_I/status/1526009552)

The major goal of the site was not only to attract a large number of hits, but also to have a large number of return visitors. According to Google Analytics, we did have a fair number of return visitors, endeavoring to replay our games and look for new content (See figure 5.1.1-5).

## Visitor Loyalty

Apr 8, 2009 - Apr 26, 2009 ▾

### Most people visited: 1 times

Number of Visits	Visits	Percentage of all visitors
1 times	95.00	63.76%
2 times	24.00	16.11%
3 times	7.00	4.70%
4 times	3.00	2.01%
5 times	2.00	1.34%
6 times	2.00	1.34%
7 times	2.00	1.34%
9-14 times	2.00	1.34%
15-25 times	10.00	6.71%
26-50 times	2.00	1.34%

(Figure 5.1.1-5) Graph describing how many visitors visited the site group by number of repeat visits.

There are an unusual number of loyal visitors who visited from 15 – 50 times since the launch of the site. This is partly due to the visits to the site by the members of the project team, visiting from separate computers over and over. However, this does not account for all 12 visitors in the 15-50 visit range. Therefore, there were a few people who consistently came back to Gompei’s Games to get their WPI gaming fix.

Along with getting return visitors, we wanted to draw people into the site and keep them on the site every visit as they tried to solve the next level of Gompei’s Gutters or explored the levels of DAKA Tray Sledding. Google Analytics provided us with how long each visitor stayed on the site. The average time (approximately 5 minutes) meant that they definitely spent some time looking at both of the games and other content on the site, which is good for giving our site and WPI in general a decent amount of screen time to prospective freshmen. While not a very long period of time, an average of 5 minutes at least tells us that visitors were kept interested, and for the amount of time we had anticipated they would stay on our site.

In addition, we had three visits that lasted in excess of 15 minutes (all from Massachusetts, and outside of Worcester), which might have tipped the scale, and partially caused the spike on April 10<sup>th</sup>. However, because Google Analytics can’t distinguish between active site usage and idle time with our page open, we are not sure whether the visitors came and played the games for 15 minutes (which is our hope) or if they just left the browser window open for that amount of time. These times do show promise for the popularity of the site (See Figure 5.1.1-7).



(Figure 5.1.1-6) Graph of the average time spent on the site per day

	Detail Level: <input type="button" value="City"/>	Visits ↓	Pages/Visit	Avg. Time on Site	% New Visits	Bounce Rate
1.	Worcester	102	4.66	00:05:46	52.94%	37.25%
2.	Wellesley	2	1.50	00:00:08	0.00%	50.00%
3.	Saugus	2	3.00	00:15:47	50.00%	0.00%
4.	North Oxford	1	1.00	00:00:00	100.00%	100.00%
5.	Waban	1	1.00	00:00:00	100.00%	100.00%
6.	Brookline	1	8.00	00:04:35	0.00%	0.00%
7.	Indian Orchard	1	1.00	00:00:00	100.00%	100.00%
8.	Brookline Village	1	3.00	00:15:54	100.00%	0.00%
9.	Auburn	1	2.00	00:00:36	100.00%	0.00%
10.	Boston	1	2.00	00:00:03	0.00%	0.00%

(Figure 5.1.1-7) Visitors from Saugus, MA and Brookline Village, MA contributed the highest time spent on the website.

## 5.1.2 Forum Statistics

The final set of forums were set up on a server we did not have access to, and we do not have data on who views the forums besides phpBB's built in view counter. However, we were able to monitor the boards to see if any prospective students had questions. After "seeding" the board with our own topics for new users to reply to, the forums saw little use by prospective students. We saw a few posts from current WPI students and GDC members, and had hoped that the variety of WPI students on the board would draw students to post more on the site, but there were no more posts other than the "seeder" posts.

FORUM	TOPICS	POSTS	LAST POST
 <b>The WPI Experience</b> Moderator: svw	8	10	by ChibiPirate55  Fri Apr 17, 2009 1:10 am

Mark topics read • 2 topics • Page 1 of 1

ANNOUNCEMENTS	REPLIES	VIEWS	LAST POST
 <b>Can't make it to the Open House tomorrow?</b> by svw » Tue Apr 21, 2009 12:13 pm	0	14	by svw  Tue Apr 21, 2009 12:13 pm

TOPICS	REPLIES	VIEWS	LAST POST
 <b>Be sure to check out The WPI Experience!</b> by svw » Tue Apr 07, 2009 12:44 am	0	27	by svw  Tue Apr 07, 2009 12:44 am
 <b>Welcome to General WPI Talk!</b> by svw » Tue Apr 07, 2009 12:40 am	0	25	by svw  Tue Apr 07, 2009 12:40 am

(Figure 5.1.2-1) View of "General WPI Talk" with view counts.

TOPICS	REPLIES	VIEWS	LAST POST
 <b>Ask Questions, Get Answers</b> by ChibiPirate55 » Fri Apr 17, 2009 1:10 am	0	11	by ChibiPirate55  Fri Apr 17, 2009 1:10 am
 <b>About Computer Advice for IMGD Art Majors</b> by ChibiPirate55 » Thu Apr 09, 2009 5:44 pm	0	22	by ChibiPirate55  Thu Apr 09, 2009 5:44 pm
 <b>About East Hall</b> by svw » Tue Apr 07, 2009 12:14 am	2	33	by ebeinke  Tue Apr 07, 2009 3:14 pm
 <b>About The Fountain</b> by svw » Tue Apr 07, 2009 12:28 am	0	17	by svw  Tue Apr 07, 2009 12:28 am
 <b>About The Makin' the Best of It Guy</b> by svw » Tue Apr 07, 2009 12:27 am	0	20	by svw  Tue Apr 07, 2009 12:27 am
 <b>About IMGD</b> by svw » Tue Apr 07, 2009 12:13 am	0	14	by svw  Tue Apr 07, 2009 12:13 am
 <b>About DAKA</b> by svw » Tue Apr 07, 2009 12:12 am	0	22	by svw  Tue Apr 07, 2009 12:12 am
 <b>About The 17 Hour Workload</b> by svw » Tue Apr 07, 2009 12:11 am	0	20	by svw  Tue Apr 07, 2009 12:11 am

(Figure 5.1.2-2) View of subforum "The WPI Experience" with view counts.

## 5.2 Postmortem

### 5.2.1 What Worked

The part of this project that worked the best was the games. We made two polished and fun games that our players really seemed to enjoy. There was very little negative said about our games once we were past our beta testing phase, and there was quite a bit of positive. Our games appealed quite effectively to our target audience, and all of the admitted students who played it found it fun.

The next best part of this project was A Closer Look. We had a stronger response from admitted students at A Closer Look than anywhere else. We had several students come up to us and ask us about WPI in general and IMGD in specific. Two of the moments from the second A Closer Look are particularly of note.

The first was a sort of meta-race that happened between two siblings that had come to A Closer Look together. They were both playing DAKA Tray Sledding on two different computers



at the same time, and were racing between themselves to see who could get to the next level the fastest. We intended to implement a high score table on our site to engender this kind of social experience, but constraints on our website prevented it. This race showed us that our games were the kind of games that you could play with your friends, which is exactly what we intended.

The second was a girl named Jen, who played our games for a while and then spoke with us about IMGD for much longer than anyone else had. She was interested in game development, IMGD, and the GDC. Jen showed us that our project had relevance to at least a subset of the admitted students. She also gave us an idea that our project might have actually helped admitted students decide to come to WPI.

### **5.2.2 What Didn't Work**

The first thing that comes to mind that didn't work with our project was our forums. The only people that posted in it that weren't a part of the project were other WPI students. In addition, the forum had very few views, consistent with only a small handful of admitted students knowing about them. In the past, the forums have been the most important part of the WPI Admissions IQP, but this time they really didn't see any activity.

Another thing that really didn't work was our schedule. We expected to be able to implement a Flash game every week for 4 weeks, which turned out to be unreasonable. We were not able to finish our games completely until the second week of the final term of the project. We weren't totally clear on our website design until a few days before we were supposed to go live. We were not able to finish the website until later on in the week than we were supposed to. We had unrealistic schedules that we didn't know were unrealistic until it was too late to do anything about them.

### **5.2.3 What We Would Do Differently**

The first thing that we would do differently is budget more time to each thing that we needed to do. We tried to do too much, and as a result we spent many nights with little sleep to try and meet our deadlines. We needed to spend much more time earlier on in the project designing our website to prevent the deadline problems that we had near the end.

We would make the forum links much more prominent in the games themselves. Currently, the forum link only appears on the last page of the game after it has been beaten for both of our games. The reason that our forums had so little activity might have been due to the fact that we didn't make the forums as prominent as the games. We would emphasize the forums much more were we to do this again.

A problem that we consistently had with our programming team was that no one knew how to program in Flash before starting the games. It would be quite beneficial to learn much more about Flash before taking on a project of this size.

## **Appendix A. Initial Design Documents**

### **A.1 NERF Wars**

#### **Gameplay**

The basic idea of NERF Wars is to walk around the WPI quad shooting people with NERF weaponry while they try to shoot you first. The field will have many elements of cover to allow the player and his enemies to hide and take potshots against one another, rather than having a stand-up knock-down bullet brawl. Each level will be won once the player is the only remaining person on the field. The game will have progressively more opponents in each level as the player advances, to increase the difficulty.

The area that the game takes place in is the WPI quad during the Orientation Olympics. During this time, there are many things on the quad that can be used as cover, such as the human foosball court and the bounce house. The quad will also have bystanders around the play area, which will throw things at the contestants if they are shot. We intend to design the levels such that it isn't very easy to hit the bystanders unless the player is extremely careless about their firing.

The basic flow of gameplay is that the player will face a group of opponents on the field, and will advance to the next level if they can successfully defeat them all by shooting them. The opponents will all be on a team together against the player. Once the player finishes a level, they then go to the next, which will be more difficult than the last. This will continue until the last level, where the player will be congratulated on their victory. There will also be a 'survival mode' where the player fights an endless number of enemies in a single field. This mode is intended to not last much longer than 10 minutes unless the player is very good. If testing shows that the game is difficult to learn quickly, there may be a practice mode where you shoot at stationary targets rather than enemies.

There are six different weapons that the characters and enemies can use. Each primary weapon is tied to a secondary weapon. Rather than pick up weapons in-game, or switch through many weapons, the player has only one primary weapon and one secondary weapon, chosen at the start of each level. Each weapon may be upgraded in the field with things like extra ammunition, more damage, faster firing speed or more accuracy, depending on the weapon. Testing will show which upgrade will be paired with which weapon. The player aims and fires with the mouse, and uses their secondary weapon with the spacebar. The weapon pairs are as follows:

#### **- NERF Pistol and Boffer Axe:**

The NERF Pistol is fairly accurate at a medium distance with a moderate rate of fire, and does moderate damage. The Boffer Axe is a melee weapon that does large damage, but only at very close range. The character will be much faster when wielding these weapons.

#### **- NERF Rifle and NERF Football:**

The NERF Rifle is a long range, high damage weapon with a slow rate of fire. The NERF Football acts like a grenade, and does damage to any enemies in the blast radius. The character will have medium speed while wielding these weapons.

#### **- NERF Machine Gun and Shield**

The NERF Machine Gun has a very high rate of fire, but does little damage with a single bullet and isn't very accurate. The Shield allows the user to take less damage from attacks from the front while it is on, but slows the user to a crawl. The character using these weapons will be slow.

The story behind the game is that most of the player's floor was eliminated from the Orientation NERF Wars, and the player is the only one left. The player must then fight through all of the rest of the teams until they have brought victory to their floor.

The game will be played with a top-down view, with the entire field visible at all times.

### **Sound & Music**

The general tone of the music for this game will be rock music, mainly to pump the player up, and enhance the feel of action in the game. Some sounds that we will be making for this game are NERF guns firing, NERF darts hitting things, people yelling, and people cheering.

### **Characters**

The player will be able to choose the gender and skin tone of the main character, and possibly the color of the character's outfit. Other than that, there will be no difference between the player and other character in the game.

### **UI**

The main menu screen will look generally as follows:

```
Main menu  Story
           Survival
           Options-----Sound
                               Quality-----high-med-low
                               Controls-----WASD+space or arrows+Ctrl
Credits
Instructions
```

While in game, the player will either use the WASD keys or the arrow keys to move, and the spacebar to use their secondary weapon. The mouse will aim, and the left mouse button will fire the primary gun.

### **Art**

The art assets that we will need for this game are:

- A character, with various skin and outfit colors
- A bounce house
- The quad
- A human foosball court
- Inflatable obstacles
- The three guns and three secondary weapons
- The main menu screen, and all the buttons on it
- NERF football and bullet impact graphics
- Bystanders

## **Must Have:**

### **Programming**

- Basic Movement
- Shooting
- Basic AI
- Multiple Weapons (not necessarily all)
- Obstacles
- Scoring and Scoreboard
- Tracking Players
- Basic Campaign Mode

### **Art**

- Basic Obstacles
- Weapons with Animations
- Two Characters with Animations (Player and Enemy)
- Main Menu

## **Would Like:**

### **Programming**

- Better AI
- All Weapons
- Alternate controls
- Alternate art quality button
- Full Campaign Mode
- Crowd Around Field

### **Art**

- All Weapons with Animations
- Several Different Enemies with Animations
- Crowd with Animations
- More Obstacles

## **If There's Time:**

### **Programming**

- Survival mode

### **Art**

- All Obstacles
- More Enemies
- More Crowd Members

## **A.2 Race to the Campus Center**

### **Gameplay**

The game will consist of the player traveling across campus, from the freshman dorm buildings to the Campus Center. The player will have to find the fastest route through blocking terrain while avoiding coffee zombies. Nearby zombies will follow the player if they can see him or her. Otherwise, they will wander around or head to the Campus Center (depending on the level and/or random chance). If a zombie touches the player, the player will be forced to hand over one of his or her precious Metal Sun energy drinks, converting the zombie into a normal

person. If the player has no more Metal Sun, the level will be failed. The player's reserve of Metal Sun will depend on the level. The player will be unable to push the zombies out of the way, even while in stealth mode.

The player will also be able to enter a stealth mode. Stealth mode expends a stealth meter while the ability is active. The meter recharges while the player is not in stealth mode. While stealth is active, the player will move more slowly, but will appear to be a zombie to the coffee zombies, who will ignore the player unless he or she gets too close. If the player gets too close to a zombie while in stealth mode, he or she will get a warning (an exclamation point over the zombie's head), and then drop out of stealth mode 2 seconds later.

The player has a slightly angled top-down view of the campus from Morgan/Daniels to the Campus Center. The map will be many screens wide and long. The player can move in all directions and enter/exit stealth mode. Each level will use the same map, including the Campus Center, various other buildings on campus, trees, etc. In addition, each level will contain a number of coffee zombies that chase the player if he or she is visible, and various obstacles that the player will have to circumvent. These obstacles include other people standing around, people writing with chalk, metal poles – the ones that block cars from driving through walking-only parts of campus, L&L speakers, a maintenance truck, plant services' small green vehicles, and sawhorses. Scoring will be based on time and remaining Metal Sun.

The faster you finish, the better you do on your quiz. An A is worth 1,000 points, a B is worth 800, a C is worth 500, and an NR is worth 0. Metal Suns add bonus points. A failed level will always allow you to continue to the next level if you want.

## UI

The main menu will look like this:

Main Menu	Play Game	New Game
		Continue
	Level Select	
	Options	Sound
		Quality (High, Medium, Low)
	Credits	
	Instructions	

While in the game, the player uses WASD or the arrow keys to move, and the spacebar or control key to enter and exit stealth mode. There will be HUD elements to show remaining stealth, remaining Metal Sun, remaining time, and current score.

## Art and Sound

The art assets we will need for this game include:

- Campus map, including:
  - the front of Riley, Morgan, and Daniels hall
  - The Quad
  - The front of Harrington and the Athletic Center
  - Higgins
  - West St to Reunion Plaza
  - The front door to the campus center
  - The wind tunnel in front of the campus center

- Player avatar, including the following animations:
  - Walk
  - Stealth mode
  - Hand over Metal Sun
- Obstacles (Prioritized below)
  - Sawhorse
  - Metal Poles
  - Other people standing around
  - People writing with chalk
  - L&L speakers
  - Maintenance truck
  - Plant services' small green vehicles
- Stealth meter, Metal Sun icons, and grade icons.
- Menu screen graphics, including:
  - Play button
  - Options button
  - Credits button
  - Instructions button
  - Continue Button
  - Level Select button
- Journal Entries? (Probably not, given the time constraints)

The sound assets that we will need for this game include:

- Background music
- Zombie “grr, argh”
- Stealth mode “grr, argh”
- Lose a Metal Sun sound
- Grade reduced sound
- Victory sound/music
- Lose sound/music
- Wind tunnel noise

### **Programming**

- Dynamic camera that follows the player
- Player movement
- Zombie AI
- Limited lives based on Metal Sun
- Grades based on time
- Stealth mode
- Dynamic sound based on player location

### A.3 Activities Fair

#### Gameplay

The goal of the game is to collect as much free stuff as possible before time runs out. The player has a side-scrolling view of the quad during the activities fair. The quad will be a few screens wide. The player can move side to side, jump, and sign mailing lists at club tables. There will be two levels, one before lunch and one after, each with its own setup, though sharing some traits. Each level will contain series of obstacles for the player to get past, such as set up tables to jump on, raised tables carried by other people, the Lens and Lights tent, or trees and branches. There will be a variety of hazards that the player must avoid. Being hit by (or crashing into) a hazard dazes and knocks the player back, slowing him or her down. Some possible obstacles include two people sparing with boffer weapons, a person with a Nerf gun firing at a target, the basketball throwing robot, pigeons that poo under them, or Lens and Lights speakers that blast sound.

There will be collectable free stuff to gather, such as pens, candy, and t-shirts. These give the player points. Every now and then pizza will be served, and the player will have a short amount of time to reach the pizza in order to get bonus points. Set up tables will have mailing lists to sign for more points. Signing enough mailing lists gets you items that open up more of the level for exploration. Some of these items could be an umbrella to protect you from falling bird poo, A boffer weapon to bonk away flying basketballs, or a handheld fan that lets you double jump to reach higher areas.

The game will consist of the player running and jumping around each of the levels getting as many points as possible before time runs out. The most points will be in the most difficult to reach spots. There will also be a bonus area in one or both of the levels, attainable by double jump only, in the clouds, where some pigeons have set up their own club table. A great deal of free stuff will be in the clouds, and signing the pigeon table will be worth lots of points.

#### UI

Main Menu	Play Game	
	Options	Sound
		Quality (high, medium, low)
	Credits	
	Instructions	

While in game, the player will be able to move left and right with the A and D or left and right arrow keys, jump with W or up arrow, and S or down arrow to sign the mailing list on a club table. If you have an umbrella, it will deploy automatically if there is poo falling on you. Space bar uses the boffer weapon (if you have it). If you have the handheld fan, jumping again in mid-air lets you jump again. The timer when pizza appears will be represented by a pizza with slices disappearing in the corner of the screen. There will also be HUD elements to show current score, time left, and items gained.

#### Art and Sound

The art assets required for this game include the following:

- A player avatar, including animations for:
- Umbrella use

- Boffer attack
- Handheld fan jump
- Obstacles (listed above)
- Hazards (listed above)
  - Pigeons will be 8-bit (digital pigeons released from the IMDG lab accidentally)
- Collectables, including:
  - pens
  - candy
  - t-shirts
  - buttons
- Pizza and pizza timer icon
- Terrain (background, ground)
- Menu screen graphics

The sound assets required for this game include:

- Background music
- Getting hit sound
- Jumping and landing sounds
- Handheld fan double jump sound
- Shooting (basketball/Nerf gun) sound
- Pooing/poo landing sounds
- Pizza appearing sound
- “Pizza get!” and “reward get!” sounds
- Picking up free stuff sound
- Sign mailing list sound

### **Programming**

- Side-scrolling movement
- Basic physics engine
- Projectiles
- Random reward generation
  - Rewards for signing up for lists
  - Pizza location and timing
- Basic NPC AI
  - NPC movement
  - NPC attacking

## **A.4 Gompei’s Gutters**

### **Gameplay**

Bounce a ball around a bowling alley to get it to a target lane!

Player looks at a top-down view of a bowling alley (Modeled after Gompei’s Gutters), with the area behind the lanes to the bottom of the screen, and the beginning of the lanes at the top. The playing field is tiled, to accommodate from the placement of pieces. Each level contains an objective/target lane, denoted by a large bouncing/flashing arrow, a set of pieces



available for placement, a set of pieces already on the field that are unmovable, and the set of pieces that are available for placement over the course of the game. The pieces on the field that are immobile can be copies of pieces that the player can use, but cannot be interacted with or environment hazards of a bowling alley such as chairs, scorekeeping device, the rental area, vending machines, or walls.

The set of pieces that are available for placement over the course of the game are:

- Ball Launcher (can be immovable or have restricted placement, based on level design)

- Jump/Catch Ramp (jumps over 3 squares, and requires a ramp to land on)

- Square Bumper

- Corner Tube (for 90° turns)

- Catcher piece

- Catches a bowling ball, turns 90°, then spits the ball back out.

- Small ramp that jumps over 1 square (does not have or need a catcher ramp)

Gameplay Use case

Player starts a level.

Player selects a piece from the inventory.

Player places piece on field.

Player places pieces until he/she is satisfied with the setup.

Player clicks 'GO' and watches the ball roll around the field.

If the setup was correct, player sees "Level Completed" screen and moves on to next level.

Otherwise, the player sees the ball explode or crash or do something appropriate to show that it did not reach its goal. The player then places pieces again, with previous setup still on board.

Crashes (putting the ball in the wrong lane or other unauthorized area) don't penalize the player, and the setup is not lost. The ball is simply reset in the launcher.

## UI

Menu Screen

- Play Game

- Options

- Credits

- Instructions

The playing field is tiled. The tile lines are nearly transparent during gameplay, until the player selects a piece, then the tile lines become apparent.

Selecting and placing pieces is done by clicking the piece desired in the inventory window. When the piece/mouse is over the grid, the tile that the piece will be placed in is highlighted. The player clicks to place the piece. Left and Right arrow keys (also 'A' and 'D') rotate the piece selected. The inventory window is to the right of the playing field. It has list of pieces available. When a piece is placed, it is removed from the list.

When a piece is deleted from the field, it returns to the inventory. To delete pieces, click the "Delete" button, then click a piece on the field. Click "Delete" again to cancel operation without deleting a piece. Alternatively, have a modifier key to signal when a click is a "delete" click. Pressing the "Reset" button will clear the entire setup.

## **Art**

- Pieces (listed above)
- Obstacles (listed above)
- Buttons
  - Go
  - Delete
  - Reset
- Bowling ball
- Terrain/Bowling alley
- Arrow to denote target lane
- Menu screen graphics

## **Sound**

- Bowling ball rolling sound
- Ball launch sound (“sproing!”)
- Ball rolling up ramp
- Ball rolling down ramp
- Pins being knocked down
- Crash/Explosion when ball goes out of bounds
- Ball hitting floor
- Ball hitting bumpers
- Background music

## **Programming**

- Simple physics for bowling ball collisions
- Inventory
- Piece selection/dragging
- Implementing puzzles

## **A.5 DAKA Tray Sledding**

### **Gameplay**

The goal of the game is to sled down the hill on a DAKA tray, trying to get as low a time as possible. While there are other sledders on the course, the player does not race them; instead, any competition will be between the players for high scores (low times).

Trees, people, snowmen, and slalom flags slow you down if you hit them. Running into trees briefly stops you and knocks you from your sled, as does running into people. Hitting slalom flags and snowmen just slow you down briefly. However, going around slalom poles successfully reduces your time.

Throwing snowballs and hitting other sledders is another way to lower one’s time. However, other sledders can also throw snowballs at the player, slowing the player down slightly for a moment. If a player hits a sledder with a snowball, the sledder will also move away from the player to try to avoid being hit again, which allows the player to pass the sledder.

If Gompei is seen on the slope, hitting Gompei with a snowball will cue a bonus round at the end of the race. In this bonus round, there are no trees or other obstacles (aside from sledders),

and no time. The players try to hit as many sledders with snowballs as possible to accumulate negative time, which will then be deducted from their time from the main level they just played. While the players are playing, Gompei is trying to tackle them into the snow to get them back for the snowball they threw at him. If he successfully tackles the player, he rubs some snow on his head and then gives him a “side-hug,” ending the bonus round.

View: This game will have a front view in which the top of the screen is the top of the hill, the bottom of the screen is the bottom of the hill, and the camera moves with the player, who is positioned in the high-middle area of the screen.

Powerups: There are 5 different powerups, with the icons for them based on names carved into DAKA trays:

- The Tray of Judgment gives the player the ability to throw snowballs out in all directions at once for a brief time.

- The Tray of Time Warp is a time manipulation powerup that causes the clock to slow down for a period of time (rather than manipulating the speed of the player).

- The Tray of Doom temporarily slows all other sledders down.

- The Tray of Stealth makes the player invisible for a period of time, so that no other sledders throw snowballs at him.

The Tray of the Unknown gives one of the other powerups randomly.

Characters are chosen from male and female with multiple skin tone choices each. The same characters will carry over through all games on our site. In DAKA Tray Sledding specifically, they will also have winter clothes with different colors on them. This is convenient so that we can reuse any characters not chosen by the player as other sledders.

Complete the race to move on to the next level. There may be a maximum time limit added that the player must score beneath in order to qualify for the next level.

## UI

Main Menu:

- Start Game → Level Select

- Options → Sound On/Off

  - Difficulty (\*adjusts number of obstacles)

- Quality: High—Med—Low

- Instructions

- Credits

While in the game, the player uses WASD for movement (W slows the character down to move him back, rather than the type of movement that is to the left or right). The player uses the mouse to aim snowball, and left clicks to throw the snowball. While aiming, an arrow pointing out from the player’s avatar toward the cursor shows the player how he is going to throw the snowball. The player can use spacebar to pause and access menu options

End Race Screen:

- High score table with buttons: Main Menu, Quit, Level Select, and Next Level.

End Screen:

Congratulations screen, see where players rank in their overall score. Return to Main Menu button.

\*\*Artistic Note Concerning Screens: Incorporate DAKA trays and their carved-in drawings?  
Maybe the menus themselves are on a tray, or carved into a tray.

## Art

Images:

- Characters with winter clothes for Character Select screen
- Snowman
- Trees: 1 evergreen and one with bare branches
- Slalom gates with curved arrows on them to indicate which direction to go around them



- Terrain
- Starting gate and finish line

Animations:

- Character moving left, down, and right
- Gompei mascot tackling, cheering, shaking fist at player (when hit with a snowball), rubbing snow in player's hair and hugging
- Scoop snow and throw animations
  - Scoop snow and throw to Left Forward
  - Scoop snow and throw to Left Backward
  - Scoop snow and throw to Right Forward
  - Scoop snow and throw to Right Backward
- Snow hits something animation
- Snowman exploding animation
- Player hitting something and falling off sled
- “Cue to start” animation

## Sound and Music

- Throw sound
- Snow hitting sound
- Person saying “ARGH!” (getting hit noise)
- Cheering crowd
- “Cue to start” sound
- Background music

Must Have:

Programming

- Character movement
- The AI will be programmed to react as such:
  - To throw snowballs at the player.
  - When hit with a snowman, tree, or character, the AI will crash and stop movement.

- Scoring and scoreboard
- Functional menus
- Tracking players

#### Art

- A basic character with all action animations
- DAKA tray menu screens and all other UI art
- Basic "crash into" animation
- A tree obstacle
- Slalom gates
- Terrain
- Start and Finish gates
- Character turned in direction (ex. "move left") animations
- Scoop and throw snowball animations
- Start cues (visual and audio)
- Background music
- Powerups

#### Would Like:

##### Programming

- Toggle quality high-med-low

##### Art

- Multiple character choices
- Snowman obstacle
- More detailed "crash and fall off tray" animation
- 2 different tree designs
- Gompei and everything Gompei-related

#### If There's Time:

##### Programming

- Gompei and all Gompei-related code

##### Art

- Crowd

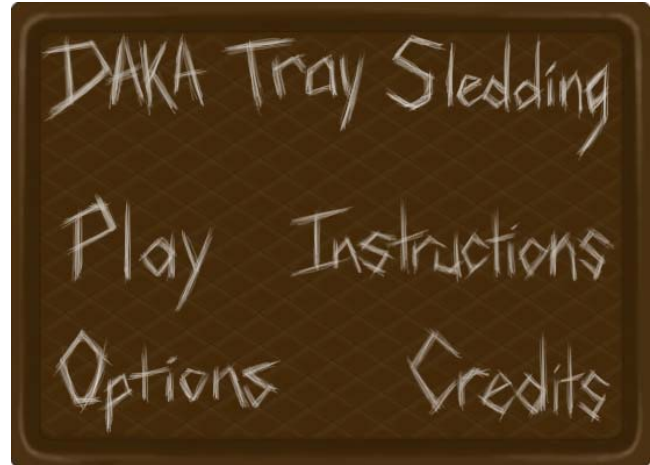
## Appendix B. Final Design Documents

### B.1 DAKA Tray Sledding Design Document v.2.0

DAKA Tray Sledding is a Flash game about racing down an unrealistically long and dangerous snow-covered hill on a DAKA tray (as previously seen in DAKA, which is the WPI cafeteria) as fast as possible, while avoiding various snowmen, trees, other people, and slalom gates. It's a race against time to get to the finish in the allotted time, with a score based on how much time you have left at the end.

The game is all about being a casual, easy to pick up game that doesn't require any commitment. Here are some main ways it accomplishes this:

- The game is imbedded in a website, so no need to download or install anything. Just navigate to the page and start.
- The game is fast. Each level takes about a minute, and there are seven total, so even if you have to retry a few, you're looking at around ten minutes of play.
- The game is simple. No complicated controls or deep menus here. All you need to do is move.
- The game is silly. It's all just fun and games. No need to take it seriously.



The main menu. Complete with painstakingly etched-in words (probably with a DAKA spoon, commonly known as the sharpest object in DAKA).



Sledding in action. The player is nicely set up to pass a slalom gate (that's the arrow thing there; you want to go around them like the arrow shows) and to grab a power up. Another sledder drifts along nearby.

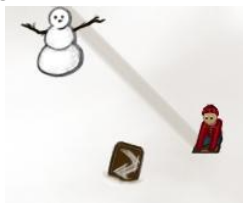
## Gameplay

As was said in the intro, the goal of DAKA Tray Sledding is to make it to the end of each level in as little time as possible. As you progress through the levels, more components get added. Here's how it works:

- Each level has a goal time, and you are given a timer that shows the time so far.
- If your time at the end is within the goal time, you pass, and you're scored based on how little time you spent.
- Crashing into stuff won't hurt you, but it will stop you for a second or two. Not good for your score!



- Other sledders will throw snowballs at you. Getting hit with a snowball is just like crashing. You can also crash into other people directly, and they crash too (either into you or other obstacles).
- Successfully going around slalom gates (without crashing into them) like so gets you a second off of your time:



- Collecting special trays gives you temporary power-ups, which help you not crash and reduce your time, or stop the other people on the hill from throwing stuff at you.



A Tray of Stealth makes the player invincible (and see-through). That snowball will pass by harmlessly.



A Tray of Judgment unleashes a torrent of snowballs, which knock over snowmen (so you can sled through them without crashing) and stuns other sledders (so they don't retaliate).

Truly the most satisfying of the trays.



A Tray of Time Warp. This one slows down the timer directly.



A Tray of Doom. Stops all other sledders in their tracks.



A Tray of the Unknown. When you grab it, you get a random power-up from among the other four

## Controls and UI

The controls are simple. You move with WASD or the arrow keys, you quit with Q, you pause with P, and you toggle music and sound with M. That's it. Well, except one more thing: Your movement is based on acceleration, so the longer you hold a direction, the faster you go, and the longer it takes to slow down. That way, the controls really feel like sledding on a slippery surface. Here are some other UI features:

- The main menu lets you just hit play and be off, but it will show you the instructions first, because people you may need to know how to play, but they usually don't like clicking the instructions button.
- Which brings us to the instructions menu, which is the second page that can be accessed from the main menu.
- There's also the menu screen, where you can change the difficulty (harder means more obstacles), change the Flash screen quality, and mute/un-mute the sound.
- Finally, the credits screen, where you can see the who made this game, and where they got their sound files.
- Before each level, you get a splash screen with information about the level. If you win or if you need to try the level again, you get a screen that tells you so.
- Once, you're in the game, you get a display at the top telling you the level, what power-ups are active, your score, and your time (as well as the target time that



Between levels, you get some hints as to what new things to expect that level. In this level, the player is first introduced to other sledders and Trays of Doom.



The instructions screen tells you how to play and what your goal is.



## Art and Sound (1 of 2)

Here is a list of the art assets for DAKA Tray Sledding:

- The player and other sledders, plus Doomed overlay:



- Trees and Slalom Gates:



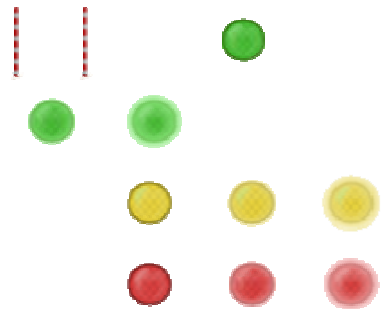
- Snowmen, with exploding animation:



- Snowballs, plus exploding animation:



- Starting poles and lights:



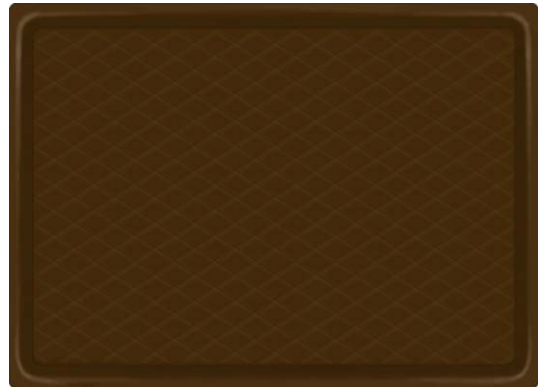
- Power-Up Trays With Sparkle Animation (one example of each frame is shown here):



- The final victory line for each level:

You've seen the Main Menu and Instructions Page already. Here are the other menus:

- The blank background used for splash screens:



- The Options Menu:



- The Credits Page:



## Art and Sound (2 of 2)

The menu buttons each have highlights and darkened versions, making them either lighter when scrolled over or darker when clicked. Some examples:



A list of sounds:

- Background music
- Button/menu click and unclick sounds
- Sledding sound to be played while the player is moving
- Start buzzers to count down to a level starting
- Hard crash sound, for hitting trees, slalom gates, and other people
- Snow crash sound for snowballs and snowmen exploding
- Victory cheer for when a level is completed

## B.2 Gompei's Gutters Design Document v.2.0

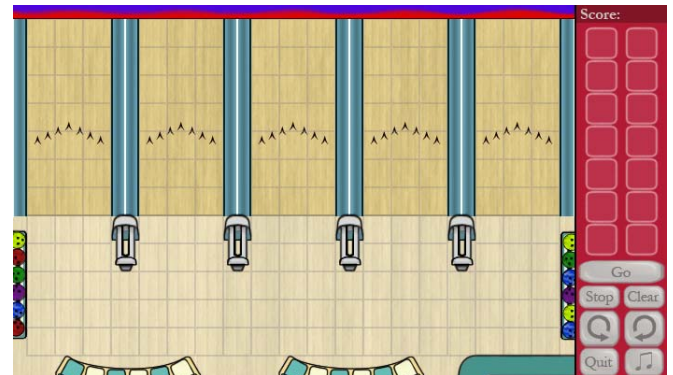
Gompei's Gutters is a Flash puzzle game set in a whacky version of the real life Gompei's Gutters bowling alley, where the player sets up pieces like blocks, pipes, and ramps to send the ball down the middle of the correct lane.

The game is very casual, allowing a player to pick it up and finish it in a short amount of time. Here are some main ways it accomplishes this:

- The game is imbedded in a website, so no need to download or install anything. Just navigate to the page and start.
- The game is short, with only ten levels. The first few are especially short, and the later ones are still easy to pass with a low score if all a player wants to do is finish.
- The game starts off very simple, and gets more complex, meaning it's accessible to anyone who doesn't know anything about it.
- The player can take as much time as is needed, and failure has no penalty except no access to the next level.
- The game is whacky and weird, and the player can just play around and have fun.



The main menu. A representation of the outside of the real Gompei's Gutters.

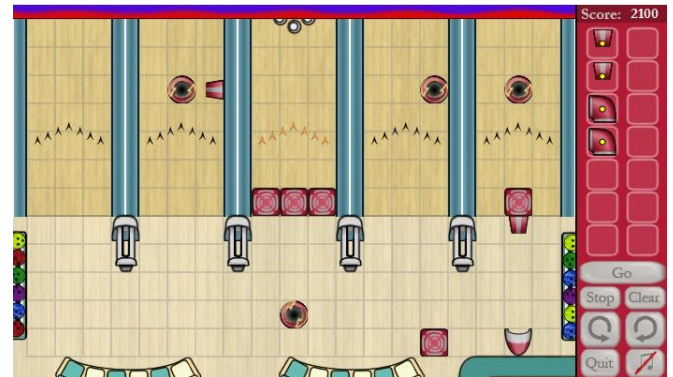


The blank playing area. This is where all the action takes place.

## Gameplay

The object of Gompei's Gutters is simple: to get a strike in each level. To do this, the player must launch set up the playing area so that when the ball is launched, it will travel down the middle of the correct lane. Here's how it works:

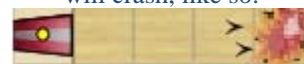
- Each level begins with unmovable pieces that make up the base level. The player then has a set of pieces that he or she can place and rotate on the level. Objects are placed on a grid.
- The ball launcher, where the ball originates, can be placed only below the lanes if the player is allowed to place it.
- When the player presses Go, the ball is launched, and it travels through the level based on what objects it runs into, over, or through.
- If the ball ends up hitting the middle of the pins, which appear in a single lane each level, the player wins.
- If the ball crashes, the player can try again any number of times. If the ball gets stuck, or the player wants to change his or her pieces, he or she can press Stop at any time to reset the ball.
- The player can clear his or her pieces back to the sidebar by pressing Clear.
- After each level, the player is scored based on how few game pieces he or she used to complete each level.



The start of a level. The pieces on the sidebar are the ones the player can place, the cave-like object in the lower right is where the ball is launched, and the lane with the glowing arrows and pins is the goal.



The ball launches off of a large ramp. The large ramps launch far, but the ball needs to land on another one, or it will crash, like so:



Pieces	
	<b>Bowling Ball Launcher:</b> Shoots the ball.
	<b>Bumper:</b> If hit, the ball bounces off in the opposite direction.
	<b>Pipes:</b> Makes the ball turn 90 degrees.
	<b>Clockwise Catcher:</b> These spin the ball 90 degrees clockwise and launch it.
	<b>Counterclockwise Catcher:</b> These spin the ball 90 degrees counterclockwise and launch it.
	<b>Small Ramp:</b> Sends the ball through the air over one square on the grid.
	<b>Large Ramp:</b> Jumps the ball over three squares on the grid. But be careful—the ball must land on another large ramp or it will crash!

A list of all of the pieces and their effects.

## Controls and UI

The player clicks and drags his or her pieces onto the playing area, then rotates them with either the rotate buttons on the sidebar or the left/right arrow keys. He or she then launches the ball by clicking Go or pressing the spacebar, and can stop the ball by clicking Stop or pressing X, or reset the level by clicking Reset or pressing C. The player can also toggle sound in game and quit to the menu. Here are some other UI features:

- Tutorial bubbles appear in early levels, explaining the different pieces. The player can turn these off by clicking the skip tutorial button.
- Player pieces are differentiated by having a yellow dot in the middle.
- The player's score appears in the upper right.
- If the ball crashes into the gutters, the side of the level, or a hole, or lands incorrectly off of a jump, "Try Again" flashes across the screen:



- Between levels, the player is shown his or her score, and an evaluation of how many pieces he or she used. If less pieces could have been used, the lowest possible number is displayed as well, to encourage replaying the level if the player wants the best score.



After each level, the player is shown how many pieces used, the least pieces that can be used on that level (if the player used more than that number), points earned, and total score.



The player is shown pop-ups of instructions during the game. Clicking one brings up the next, if there are more. New pop-ups are added as new pieces become available. The player can always click the skip tutorial button to not see any more.

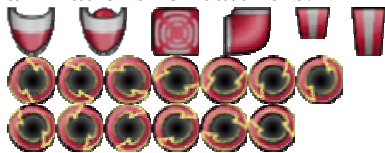
# Art

Here is a list of the art assets for Gompei's Gutters:

- The bowling ball, with rolling animations, explosion, and hole (note: the hole fades away if it was caused by an exploding ball, but is also a permanent part of some levels, causing a crash if the ball runs into one):



- The pieces, including spin animations for catchers:



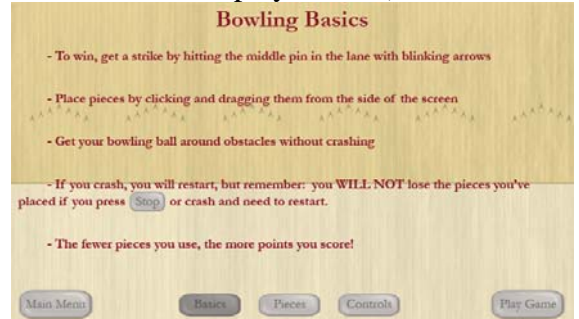
- The flashing arrows and the pins to show which lane is the goal:



- Highlights for buttons (when clicked):



- Instructions pages (instructions on pieces seen in Gameplay section):



- The options menu:



- The credits page:



## Sound

A list of sounds:

- Menu music
- Background sound for in-game (a crowd)
- Button click up and click down
- Ball rolling
- Ball crashing
- Ball hitting the pins

## Appendix C. Collected Data from SurveyMonkey

### C.1 DAKA Tray Sledding

How old are you?	What is your Gender?	In an average week, how often do you play video games?	Do you play Flash games online? If so, how often?
21	75% Male	almost every day	once every week or two
21	25% Female	Every day	Rarely
20		1 hour tops	No
25		several times a day	a few times a week
20		10+	I tend to play flash games once a week
19		daily	once a month
21		Quite a bit not as much as I used to. Was frequently now	One hour a day, or so.
20		sometimes	yes. Very infrequently

**List a couple of your favorite video games, if you have any (these can include computer games, console games, hand held games, or any other games you play)**

Settlers of Catan, Texas Hold'em, Deus Ex, Fallout 3  
Spore, Grim Fandango

Halo 3 on the Xbox Knights of the Old republic on Xbox  
Baldur's Gate II (PC)

mabinogi LOTRO dragonfable

Most roleplaying games, pokemon

Rock Band, Guitar Hero, Tetris DS, Viva Pinata - DS & Xbox  
The New Super Mario Bros

You know? Based on my previous two answers, you can extrapolate it based on the survey for the bowling thing

Half life 2. Fallout 1 and 2. Zelda: Ocarina of Time.  
Max Payne 2. Battlefield 1942. Goldeneye 007.  
Morrowind.



**Were the instructions for the game clear?**

**Was there anything that you felt could be explained better?**

A lot of commands, but I ended up only using WASD. If we're presented instructions when starting, why have

a separate menu choice? Level to

level info was perfect, concise and

very useful!

The icon collecting seems pointless

Instructions were clear, the game was

pretty straightforward. One comment

when I clicked on the instructions on

the main screen it didn't pop up

Yes, perfectly clear.

Yes, except that the Trays of Doom were unclear, and I am unsure of their effect

Yes, they were clear

It was all right.

The instructions were fine.

**Was there something about the game you particularly liked or disliked?**

Very easy to play on the first try, unlike most flash games. Really enjoyed everything about it.

The controls are too floaty. But it looks very nice

I liked that the other sledders would hit things or each other, and be slowed down.

Snow is slippery, But I guess it's a realistic mechanic.

I loved the art. I disliked the lack of sound effects

It was fun!

It felt like the sledding kid was too big, and the sledding was too slow. Shouldn't he get progressively faster as time goes on? Also, the game controls tweaked out constantly between levels. As in, I would hard-steer in a direction without touching the key because I ended the previous level holding down that key.

I didnt like the fact that it was just like SkiFree from the early 90's

**How difficult was this game?**

12.5% Very Easy

37.5% Easy

50% Medium

0% Hard

0% Very Hard

**If you could change anything about the game, what would you change?**

Maybe make the snowballs more visible?

Tighter control

The sled of doom didn't seem to do a whole lot, I mostly got it when there were no enemies.

I would put scarves on the snowmen  
I would add sound effects for hitting things, snowball strikes, powerups, and maybe snickers or random chatter from other sledders.

Those snowmen kept tripping me up!

That control bug

I would add jumps where you could do tricks off of.

Spin moves at least. It would add to your speed or subtract from your time.

**Did you feel frustrated with this game?**

**If so, when/why?**

Only with the number of buttons on the instruction screen. But I winged it with WASD and did fine.  
Over steering.

No, not frustrated. I had fun

Nope

The snowmen/trees were fun, and not really frustrating  
Yes, in the control thing described above.

sometimes the controls are unresponsive and the keys lock.  
That's frustrating.

## C.2 Gompei's Gutters

How old are you?	What is your Gender	In an average week, how often do you play video games?	Do you play Flash games online? If so, how often?
42	Male 75%	Once	None
21	Female 25%	Every day	rarely
20		1 hour	None
18		10+ times	about 3-5 times a week
49		every day	yes
25		several times a day	Yes, a few times a week
16		Every day	yes. Just about every day.
21		daily	daily
21		During an average term at WPI, 1h per week	sometimes. 1-2 times a week at most
20		10+	Once a week or so, yes
20		lots.	Yes, reasonably often
21		Quite often.	At least an hour a day

**List a couple of your favorite video games, if you have any (these can include computer games, console games, hand held games, or any other games you play)**

Call of Duty 4

Team Fortress 2 Worms Sonic the Hedgehog

Halo 3, Knights of the Old Republic, Baldurs Gate II

Halo, Guitar Hero, Age of Empires, Snood.

spin a bingo, zuma, unwell mel, fairway solitaire

Dragonfable Mabinogi Lord of the Rings Online

Kingdom

Hearts Valkyrie Profile

The Legend of Zelda Series, Just about any RPG.

The Lost Mind of Dr. Brain Farazel's wand

Most roleplaying games, pokemon

Chrono Trigger (!!!!!!!!!!!!!!!!!!!!!!!) Mario Zelda Rock

Band

Metroid

Lord of the Rings Online Final Fantasies Halo Gears

of War

Left 4 Dead

**Were the instructions for the game clear?  
Was there anything that you felt could be explained better?**

Yes, they were clear  
They could have been explained better.

They were clear

The spinners were a bit confusing because it was difficult to tell which one of the two it was. How they worked was explained fine though  
no

Yes. Everything was clear.  
Yes, they were very clear. I even told them the first time I played and understood what to do, as the hints were quite useful.

An inline tooltip to let me know I can rotate pieces would be nice.

Yes, mostly. However, when the large ramps appear I didn't know the ball had to land on another large ramp to survive. (That may have just been me not paying very good attention to the game directions though.)

Yes, and the tutorial speech bubbles were great  
Very clear.

The game explanation was overly complicated. Consider a video tutorial instead.

**Was there something about the game you particularly liked or disliked?**

Liked that it made me think.  
It quickly lost interest  
It got a little confusing as you went along. You can use pieces to do some pretty strange things. The ramps can be used not to launch things, but to bounce the ball. Some strange physics.

overall play was fun and straight forward. Again (see above), It was difficult to determine which of the spinners I was looking at.

I liked trying to figure out the puzzles

It was cute that you could jump the ball.

I like the bowling theme  
Scores should be remembered by the game and listed on the level select page, so that you can try to beat your high score when you come back after completing the game.

This game was a lot of fun. I want to play more levels of it! :)

I liked the ambient sound and other sound effects.

However, when I was trying to click on some of the objects in the menu on the right, they ended up moving underneath another object, making two objects exist on top of each other in the menu.

I thought the obstacle design was clever.

The UI for clicking around the instructions wasn't completely obvious at first. Perhaps a bit sharper contrast might help.

**If you could change anything about the game, what would you change?**

Add animated people graphics  
Make spinners easier to understand visually.

It was fun, I wouldn't change it.

Make spinners more identifiable.

nothing

I would make the pieces more varied in color. I had trouble telling the whirlpools apart. Maybe a little longer? That, and maybe make it possible to not use pieces. Unless I'm just not seeing something and you /can/ skip pieces >\_>  
That bug when you put a piece back on the palette, sometimes it refuses to snap to a certain square and will instead snap to a square that is already occupied by another piece.

Just the bug described above  
Default pin hitting sound volume down. Or make it turn off with the rest of the sound. Or a sound volume slider.  
Any would work.  
Nothing that is reasonable

**Did you feel frustrated with this game? If so, when/why?**

When visualizing exactly how the ball would respond to different obstacles

No frustrated

no, overall it was very enjoyable.

easy to follow

Not frustrated, though it did eventually stump me.

Kinda, when I tried not to use pieces.

I'm not sure if I'm

just not smart enough to see it, or you can't yet...

The last level wtf. (good thing)

Nope.

Nope, never.

The phase between reading the instructions and trying the game was annoying.

**How difficult was this game?**

0% Very Easy

33.3% Easy

66.7% Medium

0 % Hard

0% Very Hard

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