

# User Study and Analysis

## Introduction

After a short glance, some quick takeaways that one might have include: the simplistic design and control structure, as well as a retro sort of feel. This is all very intentional from a designer's standpoint. Our game seeks to give the user an experience of simplistic play, while providing a complex underlying control structure. That is, we create an illusion of simplicity, while incorporating deep, integrated elements into the design. That is the purpose for which we performed a series of user tests to verify. Because of this design, some key features stand out as extremely significant. Among these are the affordances of the control scheme, the intuitive design of the main menu (which we will discuss in this report), along with other miscellaneous observations and suggestions provided by our subjects.

## Procedure

First however, let us establish the conditions for the testing procedure. Every attempt was made to produce an environment like that of a user having stumbled upon our game, and wanting to learn and play it. Thus we provided no information beforehand, and simply gave them the game and told them to explore whatever they wanted to. We will discuss in depth the results of this process later, but the point here is that we provided no information. We respectfully ignored any questions, or rather told them that we were not permitted to give them advice or guidance. This was in an attempt to see how users navigate the game's homepage, and what improvements we could make.

That being said, we ensured that each user had attempted all of our situations and scenarios before they stopped playing. The basic scenarios were our different game modes, along with the addition and removal of some of our game's extra features like the bullets and gravity. This allowed us to establish dependent variables such as: game mode, gravity, and single player vs. multi player, among others. By ensuring that all of these different conditions, situations, and variables were thoroughly tested, we gathered a substantial amount of very good data that we can use to refine our game. Along with making sure these things were tested significantly, we also spent most of the time observing the users and taking notes.

Our game was also set up to automatically log certain data aspects during each user's session. The items that were logged were: log-in/exit, number of games, each game mode choice, times/distances, deaths (including what killed the player and how far they were when they died), among several other things. Overall, pretty much every basic user action other than actually controlling the ship was logged. Our analysis of the users' control of the ship was done in real time with our own eyes. So, the collecting of this data has allowed us to greatly analyze how the users went about playing our game; as well as narrow down if certain parts of the game are too easy or too hard by seeing if all of the users had either no trouble or too much trouble with each section.

After they were done playing, we went through a series of questions about the menu, gameplay, control structure, and instructions. Many of these questions were presented in a questionnaire format,

but there was also a significant amount of interviewing done. This aimed to maximize our efficiency in data gathering by allocating the basic, short-answer questions to a questionnaire, while allowing us to physically ask and discuss with the users the most important questions and issues. Also, we provided a time at the end for conversations about the set-up and design, as well as any comments or suggestions they might have had. The testing process usually took between five and twenty minutes, depending on their level of interest and enjoyment, and how long they discussed their answers.

Overall, we had about eighteen family and friends who participated in our study. It took three main sessions to let them all test it, but the results were extremely beneficial.

Furthermore, for this report, we will follow a chronological order of a user going through the game, and hopefully present an accurate picture of what a third party experiences while navigating.

## **Main Issue 1: Menu Layout**

Let us first begin with the main menu. The average user from our studies clicked various places on the screen a few times before realizing that the “Single Player” and “Multiplayer” headings were not clickable. This does pose a significant issue, as one user verbally asked, “So is the single player mode broken?” The attempt we had made earlier was to distinguish the text styles by writing the single player and multiplayer headings in the same font style as the title, in order to have a consistency of text that cannot be clicked on, as opposed to that which can be clicked on. Other users also did scroll across the clickable text, which changes font on scroll-over (or rather, turns from a fill to a stroke); however, one comment was that this did not stick out enough. The point is that users could become quickly frustrated with the game, and especially on a site with hundreds of titles, this could cause them to quickly move on to another game.

We brainstormed a few ideas for fixing this problem. First of all, the fonts themselves could be slightly altered to reflect the fact that the headings cannot be clicked. A more drastic option is to actually make these headings clickable, and allow them to take the user to a second menu which has the modes on it. Thus, everything would be clickable and this frustration would be impossible. A tertiary option is to provide further separation of the sections on the menu. For example, the “Single Player” heading and options would be in some sort of box, separating them from the “Multiplayer” area. This suggestion stems from the fact that the reason users are having this problem (although they may not be able to explain it in this way) is that the menu is slightly cramped, and they cannot intuitively grasp the organization. I say that they may not be able to explain it this way because of how our users answered the question, “To what extent was the menu intuitive?” To this question, users gave an average response of 7.8 out of 10, with a *minimum* response of 7. This can mean that after experiencing the game for a few minutes, they were able to grasp the organization; but what we want to aim for is an *immediate* intuitive response due to clear organization. So moving forward, this third option is what we will try first. By breaking up the menu, experimenting with changing font sizes, and adding graphics to enhance the organization, we will perform some directed tests later on user response. If we still see initial confusion, we can fall back on a secondary menu, although again, we aim for simplicity in design and organization, so this option is not preferred.

## Main Issue 2: Instructions

Moving on, we were able to notice something else that was not at all expected. About 15% of users clicked on the instructions tab before playing the game for the first time. This was a pretty shocking observation, and shows pretty clearly a misunderstanding on our part on the way people play games today. After going through the first three users, and seeing none of them click on the instructions, we dynamically added a question to our survey, and started posing the question, “Why didn’t you click on the instructions?” We expected answers related to the organization of the menu, or that they did not notice it, but not a single person gave that response. Instead, they simply said that they wanted to learn by trying, and just get into the game. This is a very significant observation, because people were in general very confused when they started up the game and had no idea what they were doing. *Yet they wanted to be able to click to start a new game, and immediately be able to play.* At first, this sort of reaction sounds unreasonable, and it is easy to jump to conclusions and blame the user for that sort of problem, but the reality is that this is the sort of conditions that users want games to meet.

More so, as designers, it is fairly easy to come up with creative solutions to solve this problem. The solution we have come up with is twofold. The primary solution is to add in a tutorial mode front and center. This would have all of the instructions laid out, easier levels, and would lead directly into a time trial game. The purpose of this would be to get the user accustomed to the controls and the feel of flying the ship. The other solution is to attach a summary of the instructions to the starting screen of each game. This would simply be a quick, concise explanation of the controls (arrow keys) and the pause button. This is with the realization that people who play many games are not going to go through the tutorial of every game they click on, because they are looking for something simple, but fun and addicting. Furthermore, this would fall in line with our purpose and goal in designing this game. Having the controls right there on the background of the opening screen of gameplay would be a very simple addition, but carries such a larger meaning, and enhances the gameplay without adding complexity.

## Main Issue 3: Difficulty

The next point is something else very much important in designing a game that attracts a diverse audience. This is the question of difficulty. We observe that the aspect of “difficulty” is a very slippery slope to navigate. So let us first explain why, by again referencing our design goals. To reiterate, we want a very simplistic design that attracts a large audience. Yet in that simplistic design, we should find a way to accommodate people of various skill levels and motor skills. When asked to rate the statement, “I enjoyed the game” on a scale of 1-10, about 85% of the users rated the game an 8 or higher. While this is a fairly strong rating, we can learn a lot by looking into this other 15%. The reason for these ratings being low (usually right around 2-3) was that they were awful at the game, given its current difficulty. In fact, not a single person was able to fully complete the time trial mode! This is very significant, because while we can aim at creating a difficult, addicting game (think “Flappy Bird”), we find that we can be much more successful in designing a game which accommodates users of lower skill as well.

Because of this, it becomes apparent to us that while it was not in our original plan, having a secondary menu to give difficulty to the game modes seems important, at least for time trial mode. The way we can implement this is to assign each level a difficulty rating, and have the user select a difficulty when they select the time trial mode. To keep the simplicity of design, the mechanics of this will be to display a little pop-up box using the same design as the pause menu. This will also give a form of continuity between the menu screen and the gameplay screen. In addition, it adds minimal complexity to the design, while keeping the main menu clean for easy organization. Finally, the box will have an 'X' in the upper right corner to easily close the box and see the full main screen. While the box is open, no other buttons will be activated. In challenge mode, we need to implement the accelerated screen that was in the original design document, to allow the user to get into the game first, and to also allow the user to be challenged. Ideally, the game should have a sort of user defined limit on how far you can get. For example, while the game would keep going forever, there should be a point where the difficulty becomes almost unbearable. The point there is to keep iterations of the game high. This is not meant to be a game that you play for more than 10 minutes at a time, but rather something that is addicting, and leads to a cumulative session of an hour or more through playing multiple games.

## **Main Issue 4: Control Mechanics**

A final point that is important to bring up is that the users often griped about the speed of the thrust and rotation. This is in contrast to the fact that all users responded with a 9 or 10 when asked the question, "How intuitive/natural were the controls?" Thus, everyone understood the controls, but it was rather just the mechanics that they felt could be improved. Anyone who mentioned this during the comments/discussion portion of the test suggested that the thrust acceleration be decreased, and the rotation velocity be increased. However, rather than discuss ways to fix this, we wish here to defend the choice to keep the mechanics as is.

First, many users mentioned the challenge of the game as a bonus. With the short gameplay, it made them want to play more. They wanted, in essence, to master the controls of the game. We therefore propose the following: that the most successful games in the past years have involved controls that were immediately quite difficult, and that this difficulty made the game unique. Furthermore, *while we do not assert this observation as part of the user study*, we think it worthwhile to point out that it is very much possible to navigate all of the current levels, with the control structures, for an indefinite period of time in challenge mode. In other words, we believe that the accommodations we are making for easier game modes allow us to push aside any gripes about the mechanics of the thrust and rotation; and that we fully believe that by doing so it will enhance the success that the game can have. Furthermore, we point out that we do this knowing that of all the problems users had, this is the easiest one to change.

## **Miscellaneous Comments and Discussions**

As stated, after the testing period, we left time for general discussion about the game, and suggestions that the users might have had. Here is a list of interesting comments that were mentioned by individual subjects, and our concise observations on how to fix them.

- When asked to rate their understanding of the purpose of the game, one user noted that the immediate goal was *always* clear, but it was not always clear how that played into the long term goal. This can be solved in a couple of ways. First, the goal can be placed alongside the instructions in the opening screen of a game, and we can also add the progress bar to the single player time trial mode to give them the sense of a larger purpose.
- One user suggested customizable color schemes. This is very much a possibility, and furthermore has a fairly straightforward implementation. It is not a certainty if this will be added to the final design, but it is a possibility.
- Users asked if they could compete using the same computer. Again, with the online mode in place, it would not be hard to implement a split-screen mode to play multiplayer on the same computer. The main issue is that this would require a reorganization of the menu structure. As of right now, this is not in the final plan, but we keep it open as an additional possibility.
- Having five lives for time trial mode did not seem sufficient. Furthermore, with the animation up and running, this provides a reasonable penalty for death, so having a limit to deaths does not seem pertinent. One other thing to note is that if deaths are not limited, then there could be some small time penalty added at the end for each death.
- The online challenge displays the same screen twice. One suggestion is to combine this into one screen, and have yourself and your opponent on the same screen (with the opposing ship a different color, like blue). This would allow the players to use the large screen, which was the preferred option.
- There is no confirmation or feedback given by our client when a user is waiting for a multiplayer game. They simply press the button corresponding to either multiplayer race or multiplayer challenge, but the game does nothing to acknowledge it. Therefore, one fairly easy solution could be to have a small window pop up that displays a message confirming that the user is waiting in the appropriate queue. This window could also have a button for leaving the queue if the user decided they don't want to wait or want to play single player instead.

## Future Possibilities

Furthermore, we present some ideas that we came up with after discussing the users' comments, and brainstorming creative additions to the games based on the general feedback we got from the users.

- In the instruction menu, put a little ship in the background, which can fly around on the screen. This would be the equivalent of a sandbox mode, and would allow the user to try out the controls right there. If they hit the edges of the screen, they would simply respawn in the middle.
- Add "power-ups" of some sort to the online challenge. For example, have a collectable item which turns on gravity for the opponent, or one which sends a wave of bullets at the opponent.

## Bugs Found

Finally, here is a list of bugs which users found during their testing.

- When a bullet hits you on the respawn point, you keep dying over and over until it passes. This process usually lasts about 30 seconds, during which time you can do nothing at all
- When you die against the back wall, you respawn in the wrong spot, and die indefinitely
- When you restart during a death animation, the ship goes to the wrong spot and the screen keeps scrolling from the death animation. This same effect can be seen when you go to the main menu during a death animation, and then start a new game. The only way to play another game from there is to refresh the page.

## **Conclusion**

In conclusion, we have presented a few areas of significance in the design and implementation of our game, and discussed the users' thoughts and experiences in those areas. All in all, users did find the game enjoyable and meaningful, as well as addicting. We look to improve those areas mentioned, add and make improvements to other elements, and fix the known problems that users were able to find through testing. This is all in hope of giving the user a simplistic experience, with a complex underlying game, that keeps them hooked for a long period of time. All in all, we are optimistic about the potential of the game, and seek to improve clarity in menus, make accommodations for the less experienced user, and allow players to quickly begin and learn on the fly, all while maintaining the appearance of a very lightweight design.