An Investigation of the methods used by game developers to teach their players how to play their games through gameplay rather than dictation.

Extended Project Qualification

Introduction

Design is everywhere in the modern world. From fizzy drink[1] cans to doors[2], the world we live in has been engineer by designers in ways we sometime don't notice. This is partially because good design makes actions easier to do, like grips on screwdrivers making them easier to hold. But one aspect of good design is its ability to communicate instructions with words. For example, doors. Particularly the door handles themselves. See if the door needs to be pulled to open, it has a handle, and if it needs to be pushed, it will have a flat surface. In the same ways we can examine a physical object's design, so can we examine a virtually game's design.

This essay will specifically examine the techniques and tools used by game designers to communicate the instructions for playing their video, but not through words but instead play. Then I will create a video game level using the same techniques in which, one level could be designed to teach all the mechanics necessary for the game through play instead of dictation in a fun and enjoyable way while still providing a challenge for veteran players.

A discovery of Game Design

In January 2017, I found myself revisiting a video I had seen many times before on YouTube. It was an animator/voice actor making a video on the game design of Mega Man X and how this game was a successful sequel as it surpassed its predecessor, Mega Man, in almost every regard. But Arin Hanson, the voice actor, was making another point, one about the industry as a whole. He states:

"I think it's weird how gaming's subject matter has been aimed more towards adults, and teenagers, with all the blood and the killing… But the way games are designed seems like it's catering more towards kids who don't know what…is going on with the world… [Tutorials became more obvious in] the '90s due to gaming hitting the mainstream. This is a result of game developers assuming the non-gamer masses are all dumb, and they can't identify simple patterns in their head like normal human beings can."[3]

The video then goes on to give examples of good game design and points out where the developers help you learn the game by your own intuition and not by a pop up message on the screen telling you what you could find out yourself. This is an example of an "*Invisible tutorial"*as Mark Brown of *Game Marker's Toolkit* points out.[4] This video really opened my eyes to the fact that this medium I had been consuming since I was 7 was created by people for other people to play. Now let me qualify—of course video games are created by people, but children generally blast through games without asking why developers designed the game as they did. Most people don't analyse how games lead players to reach a goal/experience such as "fun" in *Mario* or "fear" in horror games such as *Silent Hill*. But game design has been around for millennia through board games such as chess and snakes and ladders (Floyd and Portnow, 2014). This led me to the idea of creating my own game.

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[1] (Hammack & Kranz, 2015): https://www.youtube.com/watch?v=hUhisi2FBuw

[2] (Posner & Mars, 2016): https://www.youtube.com/watch?v=yY96hTb8WgI

[3] (Hanson, 2011): https://www.youtube.com/watch?v=8FpigqfcvIM

[4] (Brown 2015): https://www.youtube.com/watch?v=MMggqenxuZc

[5]

Entity Design Choices

I began by doing some research on how to even start making a game (Alexander, 2015) (Alexander, 2014) and found out how to program in different enemies, weapons, etc (Alexander, 2016). *Entity* is the over-arching term for "characters" in the game whether they are the player characters or enemy characters.

The Player Character (PC)

The main entity is the player character (PC). This means it is important to get the design of the character right. The PC was designed with simplicity in mind as this game was created for novice and inexperienced players. The PC only performs 5 actions: walk left, walk right, jump, attack (using a boomerang) and wall jump (which isn't actually necessary to complete the level). Initially, in most parts of the artefact I over-estimated my players' gaming ability as I wasn't in the correct mind-set of my target audience. You will notice this a recurring theme in this dissertation. However, the PC seemed to be the least effected by the changes as I only "buffed" the PC by making his jump height higher allowing him to clear the same gaps with much more ease. The boomerang as a weapon was left unchanged, as it was a well-balanced tool to use in an attack. It covered a large area in front of the PC and it could hit the same enemy twice if the player was skilled enough. You could throw the boomerang while jumping or run away from it entirely. The idea behind the boomerang was to make it a *versatile verb;* a simple action that can perform many functions. An example of this shown in Game Marker's Toolkit (Brown, 2017) was Mario's jump and its evolution. Brown states:

"It means that interesting gameplay full of tricky choices and player expression can be derived from the most fundamental interactions with the game" (Brown, 2017)

And while the boomerang may not be as versatile as Mario's jump it was an attempt to create depth and interesting gameplay through simple methods. In this area I think I succeed.

[5] A to scale reference of all the entities.

The Enemies

Longma

The design behind the Longma (Long – lama) character was simple. He is the first enemy you encounter so he is simple to beat. You can either kill him—which will take longer—or jump over him. He walks slowly back and forth in a straight line making him very easy to defeat. He has horns on his head to signify to the player that he can't be jumped on to be defeated since some players may default to jumping as Mario has set such a universal standard in this regard. However, even if you do just jump on his head he doesn't do much damage, allowing the player to learn from their mistakes.

Batrang

Batrang (Bat – boomerang, since it also follows you) is designed to teach the player to jump and shoot the boomerang. In testing, these enemies where the least liked and the scariest as they were hard to hit. However, they eventually come into your line of fire if you run from them long enough. They also do twice as much damage as Longma but die in one hit.

Firall

Firall (Fire – ball) are the hardest standard ones? enemies? because they fire projectiles. These fireballs are fast and target the PC but if one dodges it leaves the Firall open for attack. Thanks

to your pervious encounters with the Batrangs you should know how to jump and attack allowing you to kill the Fireal in two hits.

Therefore, the design goals of these three enemies are to force the player to try new approaches to the game. Longma require you to either jump over or kill Longma in order to pass by. Batrang requires the player to combine jump and attack to kill it—not just one action by itself. The Fireal requires you to jump and attack to kill it but after dodging projectiles to get a good hit in. These enemies have all been modified directly (for instance, making the projectiles travel slower) to make the game easier for the player but their design objectives remained the same.

The Boss Monster

The second most important entity is the “Boss Monster” and was the most tricky to design. Designing both the mechanics and the look of the character were a challenge. This design was chosen because, for me, it got the right mix of cute and cool. I felt the size and sound of the goat made it stand out and seem intimidating while it looked fuzzy, strange but not too scary. The goal of the Boss was to be the final exam/test for the player. It was a the final enemy the player had to face before they completed the level and since this level was meant to be an invisible tutorial, the boss should be a confirmation of what the player had learnt throughout the level. Initially the “Boss Monster”, which is called Rambash, had three main stages: jump, ram and dizzy/confused. The jump would be a way for the player to keep their distance from him while still finding it challenging to hit him. The ramming stage had a big wind up to the main attack of Rambash, hence the name, where he would be invisible. The final stage is dizzy which is an obvious vulnerability state where the player could attack Rambash and do a lot of damage. When initially developing Rambash I had his jump create an earthquake but this I found was unfair and was too hard for many experienced players not just new ones, so I removed this effect. I also increased the time Rambash was telegraphing attacks making it easier to see what was happening. Both Mark Brown and SnomanGaming stressed the importance of telegraphing attacks in order to keep the final battle difficult but also fair (Gaming, 2016) (Brown, 2017). Mark Brown also makes the point that you shouldn’t just look at how the boss is avoided

but also how the boss is attacked. This aspect of the boss fight was easier to design as I had two paths to take, should the player use mechanical/physical skill to beat the boss or mental skill. Jesse Schell states:

"Often, the intensity is increased at the end of a level by a "boss monster," who can only be defeated through a mix of puzzle-solving and dexterity. It is important… to understand what your target market prefers in a game – more thinking or more dexterity." (Schell, 2015)

From this I took the route of a more reaction/mechanically skilled fight since it fit the method of defeating the rest of the enemies up to that point.

Overall, I find Ramabash a moderately successful boss monster as most of the players who reached the boss defeated it within 3 attempts.

The Story

The story is quite simple as the only words in the entire game are the ones in the title— Picnic Pilliger. The opening cut-scene shows the PC chasing Rambash who has a picnic basket. Once you beat him you get the basket back with the chance to collect more food on the way, which will give you points.

The Controls

Since this was programed on to a computer and played on one, the controller would be the keyboard. So in order avoid confusion I mapped the buttons to most standard and logic inputs that a human would make. So the arrows were mapped for movement (run left, run right and jump) since they corresponded to the direction you would take. The spacebar is used to throw the boomerang because it's the biggest button making it more likely that the player would press it to see what it does.

The Level Design

The design of the level over-shines the importance of character design, as it is the part of the game, at least mine, that the player has no control over. The level design includes the design of everything to some degree since it is the place where the game is happening. The level allowed me, the designer; to craft the experience I wanted the player to enjoy. And since I wanted to teach the player how to play my game, I had to then craft different situations that steadily taught the player how to play. This, however, has been done before particularly in older video games such as Mario, Sonic and Mega Man since in those days data storage was much more limited making it inefficient to have text pop up on the screen to tell the player what to do especially for a game with simple mechanics such as Mario. This is seen in possibly the most analysed level of all time: World 1-1 for Super Mario Bros. (Floyd and Portnow, 2014) (Haubursin and Prosner, 2017). I emulated a few of these design tricks into my own game. One of the more obvious examples is starting the game with the character facing right in order to show the player that you move right to advance. I also choose to move from left to right because it is the natural direction of travel across a screen for our culture since most other 2D games go in this direction but also

most modern languages are also written from left to right. I also used the level design philosophy of the director of Koichi Hayashida, (Nutt, 2012) director of Super Mario 3D World and the Super Mario Galaxy games: Keshōtenketsu, a style of writing in 4-line Japanese poetry and comic strips. This philosophy involves four steps: An introduction to a theme, a development of the theme, adds in a twist of the theme and then a final conclusion. This was the philosophy when designing my level in the grand overall scheme. I introduce you to fighting with a single Longma, and then introduce you to jumping over small death pits and navigating your way on elevated platforms in a safe zone so when you fail you don't die. Then I developed the town themes of fighting and platforming, by introducing new enemies such as Batrang and Firall and by implementing longer platforming sections with death pits with the platforms having varying heights as well as lengths. Then the theme has a twist by adding them together in a platforming section where it includes Batrang trying into kill you. Finally, the conclusion is the battle against Rambash which aims to test your skills you have learn so far.

Overall, the idea of the level was to progressively increase the difficulty in a manageable way for beginner players in order to passively teach the player the game mechanics.

The Art/Cosmetics

The art choice was based off a more 8-bit/pixel-art style to give the same feel as retro games, which would link people's memories of when many of who experienced those older games, whether through playing or just observing. It also made the game have a clean and simple interface making it easy to understand what was going on, which is very important for new player. It's also easier to animate and produce different characters quickly. (Mort, 2016)

The Music

While music doesn't play a huge role in the learning of the game, it plays a very important role in the overall experience for the level. You can craft different feelings with music and communicate a lot to the player via music. There are 5 pieces of music in my game: one for the title screen, one for when you are playing the main level, two for the boss battle (one for the start and another for when he is in his final form) and the victory music which gives a clear signal to the player that the game is finished and the player has won. All these pieces of music were inspired by other music in which I did research in the ways in which games convey the feeling of 'cool' such as in Mega Man or 'fun' in Mario (Music Theory, 2016).

Results

Name	Age	Gender	Experienced Gamer?	Amount of level completed
Steven	16	Male	Yes	100%
Jackson	12	Male	Yes	100%
Janice	49	Female	No	56%
Curt	49	Male	No	78%
Claire	19	Female	No	92%
Kelvin	17	Male	Yes	92%
George	17	Male	Yes	100%
Annabel	17	Female	No	56%
Rose	17	Female	No	70%
Joe	14	Male	Yes	100%
Eve	16	Female	No	100%
Zain	13	Male	Yes	100%
Karsten	17	Male	Yes	100%
Lars	22	Male	Yes	100%
Henry	7	Male	No	56%
Anna	9	Female	No	62%
William	5	Male	No	100%
Lydia	15	Female	No	70%

These were the results of 18 people who played my game. There were 7 female play testers and 11 male play testers. Most of the demographics are self-explanatory, however, the variable of experienced gamer and amount of level completed need some explanation. Experienced gamer referred to someone who play an extensive amount of time playing video games (at least 1 a week). Amount of level completed was verified by the furthest horizontal distance from the start of the map to the end before giving up.

Evaluation

Looking at this data it can clear to see that experienced gamers were much more likely to complete the level with 87.5% of them completing the stage. This is much larger in comparison to 20% of non-experienced gamers completing the level. Out of the unexperienced gamers, the average amount of level completed was 74%. This suggests that the earlier part of the level was much easier than the latter part. This made it clear to me that the difficulty of the level was the hardest thing to fine tune. A possible way to soften the difficulty curve would be adding more levels. This would help by lengthen giving more space and time to master all actions and verbs. Other methods of solving difficulty could be having dynamic difficultly which changes depending with your progress in the game, life Resident Evil 4 (Mark Brown add in thing) but that is better implemented over a whole game rather than a single level.

Conclusion

In conclusion I feel that my artefact was successful at creating a fun game with an intuitive, invisible tutorial woven in to it, with the research of other games through playing through them and making my own analysis on levels such as Cutman's Stage (Hopkins, 2018) in Mega Man and comparing it to others (Hanson, 2011) to give an overall deep understanding of the art of the 'invisible tutorial'. I think the coding was well versed and had breadth in the difficulties I faced, with the Boss Monster and the Boomerang, due to the variety of enemies, including projectiles, homing attacks and a diverse battle. However, due to the lack of success novice player had with my game the practical side may need to take more from Kirby rather than Mega Man. Despite this I feel I was successful in creating and environment in which players can complete and enjoy the game without any direction or help. Overcoming limited amount of line of code and many frustrating bugs have pushed my mind and body, and expanded my programming experience significantly.

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