Game design of multiple genre, testing player experience on shifting combat.

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ABSTRACT
As more and more people get into video games. We look at what makes for a good experience. Psychological factors which enriches gameplay like flow and immersion. And Game design factors which provides conditions for flow and immersion. We gather knowledge and use these factors to implement a video game prototype with two versions for testing a scenario. In this scenario the player is set out in the world to fight terrorists in a top-down shooter. Version 1 keeps top-down shooter throughout the entire level while version 2 changes the combat system to a Japanese Role-Playing Game style on the end boss. We then sent out both versions to testers to measure their experience with both versions. Measurement is done with the Game Experience Questionnaire and interviews were held with the testers. The results from this study indicates that the experience is largely unaffected. This may however be due to many causes as, sample size, the scenario itself and more.

Author Keywords
Immersion; Flow; Video Games; Games Experience Questionnaire; Disruption;

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
There is a lot that can be learned through looking at and studying video games. Players get sucked in and put in a lot of time and effort into them. What makes them engaged and which elements influences their experience is interesting to look at for developing new products. As video games become more complex and new systems arise like VR (virtual reality), AR (augmented reality), it’s important to see how shifting things affects experience. With advancements in technology maintaining a diverse and engaging experience can be tricky. There are multiple things which could have negative impacts on user experience for example a too large heads-up display (heads-up display is a part of the user interface which shows the player current information about their characters status or game status) and other user interface elements [7]. Another thing to look out for is cutscenes which can act as a double-edged sword. Where on one hand it improves on the user experience but on the other it drags down and ruins the experience [13].

Now what is user engagement and what characteristics is there? J. Brockmyer broke it down into four main categories, absorption, flow, presence and immersion, when they constructed their Games Engagement Questionnaire [1].

Absorption
Being psychologically absorbed alters the state of consciousness where you feel involved in the moment. Where you lose track of reality and space out. You feel different like you’re the one getting hurt or damaged in the game [1].

Flow
People experience flow when the challenge is at adequate level to their skill. At the edge of being too easy or to hard where it’s balanced perfectly. This sense of flow is a situation of complete absorption or engagement [6]. The experience of flow can happen from almost anything but there are three conditions:

- A clear set of goals.
- A balance between perceived challenges and perceived skills.
- Clear and immediate feedback.

The first condition brings direction and purpose to an activity. The second condition gives the activity more satisfaction when completed as it is at the edge of hard and easy where overcoming brings a sense of joy. The third condition is the payoff of the activity, where the player progress through different obstacles and gets a feeling of accomplishment as the player defeats a boss or completes a goal [2].

Presence
Presence is the sense of being one with the medium. Where reality gets lost and you are fully engaged with the activity. It’s the experience of being inside the environment and doing what you would do as if the environment wasn’t there [9].

Immersion
Immersion can be described as the feeling of being inside the game [1]. It can be divided into 3 stages, engagement, engrossment and total immersion. In the first stage, engagement, the game must feel good for the player. Where controls and gameplay suit the players preference. Involvement will then feel better and with more time put in the player might get more immersed. The second stage,
engrossment, the player gets more emotionally invested in the game. Where decisions matter more and have more depth to the player. The third stage, total immersion, is when the player feels like they’re truly inside the game. This is when the player gets detached from reality and the game is all that matters [5].

Game design
As the characteristics of user experience can be delicate, we’ll look at how transitions and shifts in gameplay affects experience. How the combat and pacing changes, what makes for more enjoyment. Where the sense of flow and immersion can be hard to maintain as difficulty may differ from person to person since they might have different previous gaming knowledges and skills. Since the first time a user is playing a new genre, they will be more likely to perform worse than an experienced gamer which have learned the basics through multiple playthroughs of similar games. How level design affects the experience and what creates interesting experiences. How players choose to approach problems and their way of solving them. Making sure there is variety to be had which suits different playstyles.

To create a scenario for testing I built two versions of a prototype, Desert Recon, which consist of a top down shooter that transitions to a Japanese role-playing game. Where in the climax of the game the combat system and scene view will change from that of a top down shooter to a side view Japanese role-playing game combat. This will later be tested with a group of people with two systems, where the first system is without transitioning and the second system is with the transition. This is done to find a basis for comparison between affected experience.

Delimitations
This study will only be done on our prototype “Desert Recon”, which is a top down shooter with Japanese role-playing game elements. For evaluation Game Experience Questionnaire is the only Questionnaire used.

Research Questions
In this study we will develop a scenario where we can measure how a shift in game mechanics affects user experience. Where we can learn about what makes for an interesting experience and which elements can help towards inducing flow.

RQ1: How does transitioning between combat systems affect the games experience?

RQ2: Does our prototype Desert Recon induce a flow state?

THEORY
In this chapter we’ll look at methods used in game design and design choices when it comes to shifting gameplay as well as methods to evaluate and measure certain elements in HCI.

Video game design
In video game design there are many elements to consider (story, characters, controls, camera, environment, combat and more) when creating a game. Each element has an important role for a fluid experience [13]. Level design elements also contributes to a more fluid experience where different lighting, objects and pathways contributes to a more enjoyable experience which constitutes to flow experiences. Where lighting at certain places helps guide the player through the level and show spots of interest, cover, objectives and similar things. Objects which can be of help and hindrance to the player. That fills up open areas and makes for places of cover. Pathways were the player gets to assess the situation and make a choice on how to engage. Which way the player wants to go and how the player wants to go forward. As these level design elements give the game more depth and makes options for different playstyles [4].

Having realistic elements helps to immerse the player and improve enjoyment to some degree. But too much realism can harm enjoyment as moral barriers get broken and players feel the violence of their actions. Identified areas where realism improved on enjoyment in shooters was audiovisual realism. Where the sensory intensity is accurate to the environment and social realism, when the interactions between characters and player are like the ones happening in the actual world. War is not a pleasant place to be though so too much simulation realism can prevent players from mentally distancing themselves. Which would harm their experience [3].

Cutscenes
Transitioning is something to be done with caution. As disruptions of gameplay can be tedious and annoying to the gameplay experience [13].

What to be careful of when transitioning is confusing, unnecessary cuts, hyperactive camera work, violations of basic rules of screen direction and inattention to continuity. When building a cutscene it is important to know its purpose. Whether it’s to advance the plot or give the player a reward the purpose needs to be clear.

When cutting in and out of gameplay it’s hard to know were the character is going to be and this can lead to discontinuity. Discontinuity will cause confusion in the players mind as they may see their character pop in and out. To make sure this doesn’t happen there are some techniques which can be used, cutting to a different camera angle, cut-ins and cutaways and lead-ins and hand-offs. Cutting to a different camera angle can hide any discontinuity by using a completely different angle were character jumps can’t be noticed. Cut-ins and cutaways work on the way that you go close on something and then transition back into a wide shot. Lead-ins and hand-offs work in the way that you point the camera at some large object on the side and then swing the camera to the action [16].
**Level design**

When building a level, it’s important to make sure that the items you occupy the level with makes sense in the current context. For example, when you’re making a western themed game with cowboys and Indians it wouldn’t make sense for there to be Nazis, there. This would break the illusion and ruin the immersion for players. So instead of Nazis, perhaps some bank robbers could be there. What Players want is an escape from reality where they can set aside their daily life troubles to get entertained for a moment and for that the content needs to make sense [14].

Continuing building the level there must be challenge. After the player has gotten accustom to the games setting and controls adequate challenge is crucial to keeping player interest. If the level is too easy the player will lose interest and look for other games to play. If it however, is too hard the player will fail and give up. To balance the difficulty of a level it needs to be play tested comprehensively and balanced correctly for the target audience. This is tricky when introducing more elements and adversity into the level. Then it’s better to keep it simple and taking small steps. Showing player new enemies and teaching the player slowly how to handle these enemies in combination with previous ones [15].

Challenging the player to take on different approaches to a situation and catering to different playstyles were some might prefer to go into the middle of the action while others might look for a way to sneak around [15].

When designing you need to be aware of items the player will get and work around the level to make the player benefit from their newly attained items. Places where they can progress with their new item which wasn’t possible before. Building to meet player expectations and rewarding players for exploring. Creating something in which the player gets to grow and learn new tricks. As the level advances keeping the pacing of the level up and increasing the difficulty [13].

**Flow**

Flow theory is something that have been going on for a while and there has been struggles on exactly how to define it [11]. Flow has been described as an experience in which you feel like you’re in full control, were the sense of time is forgotten if it’s not part of the task at hand. It is a state were the person gets completely absorbed, which is intrinsically rewarding and requires a perfect balance between challenge and skill to be achieved as seen in fig. 1 [2]. The motivation to achieve a flow state can be quite tricky, where an activity is perceived to be too difficult and that they lack the skills, anxiety or boredom can arise. However, if the perceived difficulty matches the skill of the participant motivation for the activity will then be carried on based on how well the activity meets up expectations [2].

![Figure 1. Flow diagram based on original research by Csikszentmihalyi [11].](image1)

As more studies have been done the flow experience is more like fig. 2. Where more states have been determined and simply being in between skill and challenge to create flow experience is not enough. It needs to surpass a certain threshold to where it fully absorbs the person. When simply watching tv is correctly matching skill and challenge like seen in fig. 1. It doesn’t account for a state of flow. It results in a state of apathy which can go to boredom or relaxation. Overcoming difficult challenges were skill is not matched can first be met by anxiety but after succeeding leads to a state of arousal [11].

![Figure 2. Flow diagram based on Nakamuras [11].](image2)
**Disruption**
Disruption is the feeling of getting interrupted or stopped in middle of an activity. It’s something harmful to the experience of enjoyment. It can be a long cutscene or scripted events that hinders the user from going forward, which slows down progress. It can also be a large HUD, heads-up display, and boxes in the UI can be disruptive to the gameplay experience. Where UI elements is in the way or take up important parts of the screen [7].

**Measuring Game Experience**
To measure an individual’s game experience several questionnaires have been produced. Games Engagement Questionnaire made by J. Brockmyer and her team, is one of them and it has 19 items in it (Table 1.). Games Engagement Questionnaire rates the engagement in 4 different subcategories, absorption, presence, flow and immersion, where the answers are yes, no and maybe. This version of the Games Engagement Questionnaire has been proven reliable and valid when measuring engagement in violent video games [1].

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<table>
<thead>
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<tbody>
<tr>
<td>1</td>
<td>I lose track of time</td>
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<tr>
<td>2</td>
<td>Things seem to happen automatically</td>
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<tr>
<td>3</td>
<td>I feel different</td>
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<tr>
<td>4</td>
<td>I feel scared</td>
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<td>5</td>
<td>The game feels real</td>
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<tr>
<td>6</td>
<td>If someone talks to me, I don’t hear them</td>
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<tr>
<td>7</td>
<td>I get wound up</td>
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<tr>
<td>8</td>
<td>Time seems to kind of stand still or stop</td>
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<tr>
<td>9</td>
<td>I feel spaced out</td>
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<td>10</td>
<td>I don’t answer when someone talks to me</td>
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<tr>
<td>11</td>
<td>I can’t tell that I’m getting tired</td>
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<tr>
<td>12</td>
<td>Playing seems automatic</td>
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<tr>
<td>13</td>
<td>My thoughts go fast</td>
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<tr>
<td>14</td>
<td>I lose track of where I am</td>
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<tr>
<td>15</td>
<td>I play without thinking about how to play</td>
</tr>
<tr>
<td>16</td>
<td>Playing makes me feel calm</td>
</tr>
<tr>
<td>17</td>
<td>I play longer than I meant to</td>
</tr>
<tr>
<td>18</td>
<td>I really get into the game</td>
</tr>
<tr>
<td>19</td>
<td>I feel like I just can’t stop playing</td>
</tr>
</tbody>
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Table 1. Games Engagement Questionnaire items [1].

Other questionnaires have been developed with a more general experience in mind. Like the Game Experience Questionnaire, GEQ, which has 4 different versions, GEQ core module, GEQ in-game version, GEQ social presence module and GEQ post-game module, with each measuring slightly different items. The core module measuring the subsets, competence, sensory and imaginative immersion, flow, tension/annoyance, challenge, negative affect and positive affect, where GEQ in-game version measures the same items as GEQ core but with less depth. GEQ social presence module and GEQ post-game module measures player involvement and experience [8].

Where Games Engagement Questionnaire focuses mostly on violent video games and aggressive behavior. This and the fact that it is associated with the anti-video game group which paints engagement as a negative aspect. Instead of providing the tool for a wider audience who values positive sides of engagement. The Game Experience Questionnaire however, doesn’t focus on violent video games but on the overall experience in games [12].

**Student’s t-test**
One way to determine if results gathered is statistically significant is Student’s t-test. It follows the Student’s t-distribution under the null hypothesis. For example, this method can be used to test a drug’s effectiveness compared to a placebo. Where you have two sets of groups with one getting the drug and the other getting a placebo. Results are then gathered and compared with t-test if the difference between results is statistically significant. These values are then compared to the t-distribution value at a certain P-value which is the probability of the test being random chance. Normally P-value of 0.05 is used during academic research as it has been proven reliable. If the T-value from the t-test is lower than the T-distribution value at the P-value then the null hypothesis is correct, and results may be due to chance [17].

**Related work**

L. Nacke conducted a study where they measured game experience on three half-life 2 mods specifically designed to measure boredom, immersion and flow. This study was made to get more understanding on what makes for engaging experience [10]. Compared to our work we’ll focus more on how shift and transition affects game experience whereas Nacke went for a general understanding on what makes for flow, boredom and immersion.

S. Fragoso did a qualitative study where he looked at interface design strategies to measure what makes for experienced disruptions in gameplay. In his research a group of people was interviewed and surveyed after playing a level in Battlefield. During these conducted interviews some occasional disruptive elements were recognized [7]. Although this study is similar it uses different methods to measure game experience and the reviewed environment is different.

**METHOD**
This chapter goes through my approach to answer the research questions as well as the creation of the prototype. Finally, we look at how the tests were done.

**Prototype**
To get an environment for testing I built a short videogame following the methods in the book Level up! [13]. The prototype “Desert Recon” is built using the Unity3d engine version 2018.3.6f1 and Visual Studio Community 2017. Desert Recon is a top-down shooter where the player gets to control a soldier. The soldier’s main mission is to clear out
the area for potential terrorist threats. The soldier is
equipped with a weapon that has 3 different modes, auto,
semi and burst, which the player can freely choose between.
Auto, short for automatic, mode lets the player shoot at
rapid fire. Semi lets the player shoot round per round and
burst mode lets the player shoot a burst of three rounds.
With burst mode the fire rate is reduced to not be too
strong.

The player will also have to manage their ammo, as which
mode they choose will affect their accuracy and how many
bullets they shoot in concession. This is to provide more
depth in the gameplay were the player gets to use their
weapon how they like and consider how they will approach
targets. As limiting resources places more importance
around them. Giving the player options of either fighting
multiple enemies to get more ammo or to avoid enemies but
also losing out on potential ammo [14].

A reload system is also implemented which limit the player
to not only spam shots nonstop. This is to make the player
think more about positioning and how to engage the enemy.
An experience system is also implemented where the player
levels up when killing enemies. When leveling up the
player gains skill points which the player can distribute into
3 different talents; health, rate of fire and magazine
capacity. This lets the player invest more into their
character and develop their character as they please [13].
The amount of experience required to level is exponentially
increased as to make the player work harder for each level.

Desert Recon uses a HUD (head-up display) which shows
health, level, experience bar, controls, ammo, ammo in
magazine and weapon mode, fig. 3. The main part of the
HUD is put in bottom of the screen with the intention to not
interfere the combat. The mini-map in the HUD is designed
to give the player an overview of the area. It’s placed in the
top right corner with the intention to not obstruct player
view. Desert Recon is designed to be easy to pick up and
play with control schemes that players already are used to
within other games. It uses W, A, S and D to move around
and left mouse button to fire shots. R is used to reload and
shift to sprint faster.

Designs for Desert Recon is a mashup of free assets from
unity store, creative commons and homemade prefabs. The
game music and sound effects are also from unity asset
store.

![Figure 3. The prototype.](image)

**Level design**

In Desert Recon the player starts out in a soothing and clear
area with some palm trees and an ammo box. This is meant
for the player to get accustomed to the different UI
elements and controls. The level then starts off with the
player receiving a phone call in which mission details are
told. Upon moving onwards, it doesn’t take long until the
player confronts a couple enemies, three turrets and one
tank, which tests the players skill to both dodge incoming
fire and takeout enemies. The turrets and tanks are designed
to be relatively easy to deal with on their own as they shoot
slow moving projectiles at relatively slow intervals.

As the player progress further, they are rewarded with an
extra ammo box. Here the area is surrounded by rocks and
there is a tight pathway on the right and a wider path on the
left. In the right pathway one lonesome turret is placed and
on the left pathway the area is guarded by three enemy
soldiers fig. 4. This design is meant to reward different
playstyles where some may explore and take a stealthier
approach where others just use brute force [15]. After these
encounters the area is more open with only sandbag walls
that can be used for cover. Here two ammo boxes are
placed in the middle which are guarded by multiple turrets
and a soldier. This is meant to force the player to either
methodically takeout all the targets, run in and steal the
ammo risking everything or to try and run around
everything leaving the ammo behind. Depending on
situation and the player either option might be chosen.

![Figure 4. Soldier enemy.](image)
the camera in a smooth way and positions the boss, so he doesn’t miss. The boss uses two abilities, shoot and powerup, which is chosen randomly. This is meant to put the player on a clock to beat the boss before it gets to strong. Which is designed to up the tension and make for a more interesting combat.

Data Gathering

To answer RQ1, how does transitioning between combat systems affect the games experience, and RQ2, Does the Desert Recon scenario induce a flow state, I sent out two different versions of the game along with GEQ to friends and family with only 6 testers (5 male and 1 female) responding.

The first version of the game didn’t transition the combat system and only used shooter genre, while the second version had the boss fight at the end in a Japanese role-playing game manner which changed the fight up to a turn-based strategic battle (see fig. 5.). Three testers were then instructed to play through version 1 first and answer the questionnaire for version 1. The three testers then were instructed to play the second version of the prototype and answer the questionnaire for version 2. The other half of testers got instructed to do the versions in opposite order, version 2 then version 1, and results were then calculated.

The questionnaire used was GEQ in-game version which measures the games competence, sensory and imaginative immersion, flow, tension, challenge, negative affect and positive affect. Questions are answered in 5 different ways, not at all, slightly, moderately, fairly and extremely, and the more positive answers accounts for higher engagement [8].

Scoring for the different answers are done with 0-4 were not at all equals 0, slightly equals 1, moderately equals 2, fairly equals 3 and extremely equals 4. The sums for each measured category are then calculated and divided by number of respondents to get an average score. The scores gathered from the questionnaire on first version and second version of the game were then compared using t-test. With the null hypothesis for the t-test that there is no difference between groups. T-tests were done using an excel sheet to calculate t-values. These values were then compared to two tailed t-distribution value at a probability of 0.05. T-distribution value was taken from a table online at a df (degrees of freedom) value which was calculated to 10 (12-2).

Interviews were also held to get more understanding of what the testers felt about the prototype and what they thought about the transition. To learn if they felt any flow experiences or lost track of time. They were done after tests was completed in a one on one fashion. Results gathered from interviews were then written down and kept for analysis. This in the same vein as done in study by Fragoso [7].
RESULTS
In this chapter we’ll look at the prototype, results of this study gathered from the GEQ and the results from following interviews.

Prototype
The prototype Desert Recon is a functioning video game which comes in two different versions. Version 1 is a straight top-down shooter with one level. Version 2 also only has one level and is a top-down shooter, but it ends in a Japanese Role-Playing Game setting. The level in both versions is the same with the only difference being the last boss fight. The level is placed in a desert with rocks surrounding the playable area. This stretch of desert is filled with three different kinds enemies, one boss, ten different kinds obstacles and environment items. Such as trees, skulls and plants. The level is populated with 22 turrets, 7 tanks, 22 soldiers, 230 rocks, 37 sandbag walls, 12 ammo boxes, 36 different trees, 4 cacti and 3 bones. Everything sits on a plane structure with the size of 100x 1y and 800z. The prototype is built with 1545 lines of code across 27 files and the game build is 128mb large.

Questionnaire
The Game Experience Questionnaire was administered to 6 testers (5 males and 1 female ages: 22-26) with two versions. With the scoring done from the questionnaires for each version of the prototype there are certain differences to be noted see fig. 6. With the biggest difference in challenge between version 1s 2.42score against version 2s 1.67 score. Slight differences were found in immersion version 1s 1.42 to version 2s 1.33, in flow version 1s 1.5 to version 2s 1.17, in negative affect version 1s 0.42 to version 2s 0.67 and in positive affect version 1s 2 to version 2s 1.92 score. Scores for competence, 2.25, and tension, 1.17, was the same in both versions.

After calculating T-values for each category for each version no statistically significant difference could be found at probability of 0.05 see table 2. Closest to this was challenge with T-value of 1.34 which is less than the T-distribution 2.23 at df (degrees of freedom) 10 with probability of 0.05. As there was no statistically significant difference between the results of both versions the null hypothesis that there is no significant difference was met.

Interviews
In the following interviews all of the attendants expressed some kind of enjoyment out of the game. They noted that prototype ran on every tester’s pc without any problems and no crashes or incidents were recorded. The testers also mentioned that the level was engaging and didn’t lack action. The difference in enemy types were welcome although soldiers were considerably tougher than other enemies. As their smaller hitbox combined with movement made them harder to hit. This was expressed by some testers as frustrating. As they were having troubles shooting the soldiers.

None of the testers knew anything about the game previously and were all surprised as the combat changed in version 2. There were mixed feelings about the fight, but most felt that the fight was too easy. One tester said that it was too simple, boring and that a normal enemy with different attack patterns would probably be more interesting.
The testers that got to test version 2 first and then into version 1 got especially surprised with the difficulty of version 1s boss fight. Some testers went back multiple times to beat the boss. They liked version 1s boss fight more where they felt more challenged.

During testing sessions none of the attendants expressed getting into a flow state.

**DISCUSSION**

In this chapter we’ll discuss about the results and go through different strategies for improving upon current methods used. We will also look at limitations and threats of validity.

**Results**

From the results gathered for RQ1 the questionnaire and interviews contradict each other. With testers expressing more enjoyment out of version 1s boss fight and questionnaire results stating no significant difference between the two versions. This may be due to how similar the two versions are and that the questionnaire itself isn’t very focused on the difference but more on the general player experience. It can also be due to how the scenario is designed. Where having an even shorter level to get more focus on the boss fight which has the difference between versions. However, theory tells us that badly done transitions in games can hurt player experience where jumps confuse the player and disruption of gameplay can occur [14].

These results tell us that our transition was good enough to not affect player experience. The fact that the questionnaire results doesn’t have statistical significance could also be due to sample size used in the study. Where a bigger and wider pool of testers could tell us more. In this study there were only 6 testers in ages 22-26. Other age groups might have completely different results.

Results for RQ2 tells us that there are slight potentials for flow based on questionnaire results although our testers didn’t experience flow state. This is to be expected though as achieving flow state isn’t easy and differs from person to person. Flow state can happen from almost anything but there are three conditions for it to happen:

- **A clear set of goals.**
- **A balance between perceived challenges and perceived skills.**
- **Clear and immediate feedback.**

These are confirmed conditions for inducing flow state [2]. As the scenario is relatively short it could be any of these conditions which were not met where perceived challenges and skills wasn’t balanced or that the player didn’t have a clear set of goals. It could also be that the feedback in the game didn’t feel clear and immediate. During interviews one of the testers expressed that the boss fight in version two was too simple and boring. This was in line with other testers expressing that it was too easy. Which suggests that the challenge is too low for the players skill. Looking at fig. 2 flow diagram by Nakamura the low challenge of the fight would lead to a state of either apathy, boredom or relaxation [11].

**Method - implementation**

Building a gameplay scenario for testing is a massive undertaking let alone to do it on your own. Even though game engines have gotten better with more support it still requires quite a bit of work. So, to create a scenario which is polished and has certain design elements going right for it. As lighting showing the way or some sort of realism [3, 4]. It’s just not viable especially when you also have time constraint and no experience with the tools. A lot of aspects got rushed which may have harmed the quality of the implementation. As there are more techniques to be learned and clever ways to go about things, that can provide for a smoother experience. Things like the aiming which doesn’t feel right is just something that harms gameplay experience [13]. It provides for more difficulty but it’s not the kind you want as having the player struggle with the mechanics of the game is not ideal. This would also make the study hard to replicate as not every aspect of the game is perfect.

Level design could also be improved upon as it is linear which may lead to boredom [10]. As it doesn’t give the player many options to what route or how they want to go about the level. There are some options on how to engage enemies in the areas but mostly its about run and gun. Where you shoot through hordes of enemies and make your way forward. This could be a reason to why no flow experiences were induced. Since the structure of the level was similar throughout and challenges had was not well balanced to skill required.

Other elements that could improve on the immersion and the overall experience would be more story bits. Where getting to know somebody in the game to get more reason behind what you’re doing and bring more depth in the game. This would lead to more realism which contributes to immersion [3].

**Method - measurements**

To acquire test results the game experience questionnaire was used. Copies of the game were then sent out to friends and family with the questionnaire. Only 6 complied and did the tests as instructed. As this sample size is low results

<table>
<thead>
<tr>
<th>Competence</th>
<th>Immersion</th>
<th>Flow</th>
<th>Tension</th>
<th>Challenge</th>
<th>Negative effect</th>
<th>Positive effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.14</td>
<td>0.26</td>
<td>0.67</td>
<td>0</td>
<td>1.34</td>
<td>-0.73</td>
<td>0.18</td>
</tr>
</tbody>
</table>

**Table 2. T-Values.**

The testers that got to test version 2 first and then into version 1 got especially surprised with the difficulty of version 1s boss fight. Some testers went back multiple times to beat the boss. They liked version 1s boss fight more where they felt more challenged.

During testing sessions none of the attendants expressed getting into a flow state.
may have been affected. As these testers also are mainly male and that the age group is between 22-26 this may also affect the validity of the study.

Other questionnaires or methods of empirical research could have been applied also to get more reliable measurements. As the method used, the Game Experience Questionnaire, isn’t tuned to the problem at hand but to the more general gameplay experience [8]. There were attempts to counter this by having interviews to get more understanding on how the testers felt about the change. However, these interviews could have been improved upon following some sort of guidelines with more depth.

**Source Criticism**

References used in this study has been from academic sources and industry sources. These academic sources have not been looked over as I’ve assumed them to be of high enough value to be correct. Where multiple peer-reviews have been done before publishing. Industry sources have been looked over to make sure it’s been done by accomplished people in their fields and checked if they’ve used proper references. As items range from years 1999-2019 some information might be out of date. These have been compared to newer items to make sure information is applicable today.

**Limitations**

During this study time constraints were a constant factor. As I had 8 weeks to study on different theories, build a working prototype and test. There might be some flaws in the design were some choices had to be made to account for the time constraint. As this is a single scenario tested with a low sample size results may not be accurate.

With only using one questionnaire the results may be affected. The limited amount of data is likely not enough for conclusive evidence but might be enough for further work.

The amount of references and theory used could also be improved upon as this limits the current study. Where more influences and theories to experiment and rely on brings more depth. Also a few sources used in this study might not be up to date also since some date back to 1999.

**The Work in a Broader Context**

Ethical issues which may occur due to gaining more understanding on the field of HCI and psychology, is the problem of using the information to build weapons. Since learning more about what makes for a better experience could be translated to building military user interfaces, which implements video game constructs that hides reality from the user and rewards the user when completing missions. Where the line between game and reality may become blurry.

This study gives more understanding on player experience in video games, but the main point of it is not necessarily translated well to military equipment. As military equipment is more likely to keep their state and not switch states mid combat.

The environmental toll during this study is reduced by using computer and web resources. As surveys were conducted online, no papers were printed out. Biggest effect on environment this study had, is the power usage during work sessions.

**CONCLUSIONS**

In this study we examine game design and psychology to learn about what makes for better gameplay experience. To get a better understanding of gameplay elements and their effect on player experience. Which things that helps provide for flow experiences and the conditions to achieve a flow state. What makes interesting gameplay and creates immersion in games. We then build two versions of a scenario for testing how changing the combat system would affect player experience and test if that scenario would induce flow. The scenario is placed in a desert setting leaving the player with a mission to scout the area and takeout eventual terrorists. The area is filled with enemies that the player must make their way through in order to progress forward. At the end of the scenario the player gets to face a boss which is done differently in each version. After evaluating player experience on both versions of this scenario our results indicated that there might be no affect on changing the combat system during gameplay. Our results also indicated no flow experiences during testing.

Although our results may be due to many different reasons as it was only one scenario with a relatively low sample size. Results from interviews however, indicated that increased challenge motivated players to keep playing. Which seemed to increase their enjoyment. Moving on however, we’ve learnt more about what makes for a better player experience. Which elements that contributes and how transitions can be done.

**Future work**

For future work one could go with a larger pool of participants to get more reliable data and design a new questionnaire or conduct more focused interviews on the problem at hand. They could go more in depth to how players experience different changes in systems. Studies could also be made on different genres of games with different combat shifts to see if this is a general occurrence or specific to Top-Down shooter and Japanese RPG. Also further investigating other areas which may or may not harm player experience, to identify and determine which elements improves on player experience as there is more knowledge to be learned.

**ACKNOWLEDGMENTS**

I want to take this subsection to thank all the testers for a good job and my girlfriend for being great support and sticking with me.
REFERENCES


