Transition Game Design with and for Young People with Health Challenges

Master's thesis

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Abstract

This thesis investigates whether a computer game can aid young people with long term health challenges as they prepare for the transition from children's hospital to adult clinic. Using the theory of game design and a participatory design (PD) approach, a transition game prototype is designed through two workshops with teenage participants.

Two novel inspirational methods are also presented and used during the two workshops: The Needness Scale combined with Game Design Cards (GDC) and the Game Design Workshop (GDW).

The results from the workshops are further analyzed first through a thematic analysis and then with the help of A Deck of Lenses. The analysis shows that a transition game could be especially helpful as a way of making today’s check-list system more fun and engaging, and as a motivation for the teens to learn about their transition.

In conclusion, I have shown that teens with long term health challenges can see the value of using computer games to prepare them for their transition to adult health care.
Acknowledgements

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Abbreviations

Ahus = Akershus hospital (Akershus sykehus)

BUK = Children and youth clinic (Barne- og ungdomsklinikken)

Exercise video games = exergames

GDC = Game Design Cards

GDW = Game Design Workshop

NSD = Norway’s center for research data (Norsk senter for forskningsdata)

PD = Participatory Design

PEMT = psychoeducational multimedia training

UCD = User-centered design

UX = User experience

XP = experience
1 Introduction

In this thesis I will investigate whether games can help with the transition between children’s hospital and the adult clinic. More precisely, I want to find out whether a computer game can prepare teenagers with long term health challenges for the changes that they will experience during the transition.

Transition period is filled with challenges for young people with long term health challenges because they need to become solely responsible for their own health. During that time, many teenagers struggle during the transition (Rambøll, 2012). It is important to do research on transition and to find out how new technologies can be used to help patients and keep their conditions under control, because, as Blum (2002) points out in his introduction to *Pediatrics*, knowledge about the transition has not increased significantly in the past two decades, and it is very important that changes are made in the health care community that will enable better transitions. Doing research on whether a game can make these transitions better, will generate more knowledge on this subject and could lead to changes in today’s routines. These changes can lead to people with health challenges improving their life standard by being aware and responsible for their own treatments from early age and sticking to the treatments prescribed by their doctors.

Statistics show that when it comes to boys, 6 out of 10 consider computer games to be an important or very important part of their life (Medienorge, 2013, p. 2). Girls are not that far behind as research by Kutner and Olson (2008) shows that half of girls play video games at home as opposed to three-quarters of boys who do the same. Statistics from 2015 collected in Norway show that 28% of young adults ages 13-15 played a computer game on an average day, while the percentage increases to 32% for those aged 16-19 (“Kulturvaner 1991-2015 - Resultater fra kultur- og mediebruksundersøkelsene de siste 25 år,” 2016). Because games are already a big part of teenagers’ lives, I want to find out whether a game can make it easier and more fun for young people with health challenges to address the difficulties that they will experience during a transition.
1.1 Motivation and research interest

My master project is a part of the KULU project which is about: “cool technology for young people with long term or chronic health challenges” (KULU, 2016). One of their collaborators through the years has been Akershus hospital (Ahus) and their Youth Council which consists of boys and girls ages 15-22 (“Ungdomsrådet Ahus,” 2016). The main reason for why I chose to be a part of the KULU project and do my best to make a contribution, is because I wanted to do something that will help teenagers that are not only dealing with all the “regular” problems but that at the same time have those problems being magnified because they have a health challenge. Their everyday life is as tough as it is, and the transition from a Children and Youth Clinic (BUK) to an adult hospital is a big readjustment that, if not executed in a proper way, can create big discomforts for those teens (Rambøll, 2012).

Through this master project, I want to make a contribution that will help towards making the lives of teenagers with chronic health challenges easier during their transition. A transition game does not exist today, which is why it is important to research on that topic and explore whether it has the possibility to induce positive outcomes for the patients. I have chosen to narrow down the focus of my study on designing a game that can be used by teens during transition. This led to the following research question:

*Can we use computer games to prepare young people with long term health challenges in their transition to adult health care?*

To be able to answer this question, I have split the research interest into the following three sub-questions:

1. How to implement the transition check-lists in a fun way?
2. What does the game need to have in order to motivate the teens to play it?
3. What kind of methods are appropriate to use when designing a transition game with and for teenagers?

The reason I chose to do research on whether check-lists can be used in a game is because Ahus today uses a set of check-lists during transition called “My Health” and “Ready for transition” (“Brosjyrer,” 2016). Young patients can fill out these check-list to make sure that they are ready for transition. To encourage the teens to want to use these check-lists, it is
important that they are motivated to do it, and implementing them in a fun way will lead to this motivation, which leads sub-question 2.

Considering that a game that will be used during transition and will include check-lists for patients to cross off, it is important to find out what kind of game elements can support that. It is also important to find out what the teens consider to be crucial in a game in order for them to want to play it in the first place.

Teenagers are considered young adults, but they are neither children nor adults. This is why it is important to use design methods that will enable design with and for teenagers, and especially those that have long term health challenges.

But first, let us look more into what defines a transition, what are the consequences of a bad transition and how to achieve a successful transition.

1.2 Transition

One of the most important things to get a grasp on to better understand this research is the word transition and what it means to have a transition from a pediatric clinic to an adult hospital. The term transition is a complicated concept because the transition process itself varies considerably, depending on several different factors, such as the hospital where transition finds place; what kind of routines the hospital has; and what kind of health challenge the patient has or a combination of challenges; and the support system that the young patients have around themselves.

Some researchers make a difference between the concepts transfer and transition, while others use them interchangeably (Ramboll, 2012, p. 86). In my master thesis, transfer shall be equal to a onetime event, while a transition is what the research will focus on, and is the process itself, where the young patients are growing up and at the same time have to deal with a completely new environment at their treatment center. My definition corresponds with Sal’s statement that: “transition is a process and not an event” (Sal in Blum, 2002, p. 1302), and also with Blum et al.’s definition of medical transition as: “the purposeful, planned movement of adolescents and young adults with chronic physical and medical conditions from child-centered to adult-oriented health care systems” (Blum et al. in Callahan et al., 2001, p. 110).
But what is the worst thing that can happen if a transition isn’t properly facilitated? Research done by Rambøll (2012) shows that if a transition isn’t executed properly, it can lead to patients not taking their medicaments regularly, not showing up for their follow-up sessions, getting even more sick or worst case scenario: an unexpected and early death. A concrete example is given by Wyller (2013) who points at Bell and Sawyer’s article where during a transition patients reacted in a rebellious, teenage way and stopped taking their medications.

Børsting (2010) on the other hand discovered that the patients with congenital heart defect came across some other issues during their transitions, such as lack of knowledge about their specific illness at the adult hospital that the employees at the pediatric hospital had, as well as getting a sense of being alone and losing their sense of security that they had at the pediatric hospital.

To achieve a successful transition, Reiss and Gibson (cited in Blum, 2002, p. 1302), recommend 5 ways of facilitating transition: “[…] 1) have an orientation that is future focused and flexible; 2) anticipate change and develop a flexible plan for the future; 3) foster personal and medical independence and creative problem solving; 4) develop a specific and detailed transition plan; and 5) celebrate transitions”. In accordance with the third recommendation, Wilhelmsen (2013) underlines that a transition should be equal to making sure that the transfer itself from pediatric clinic is good and that it empowers the patients so that they can start taking care of themselves and be able to orient themselves at the adult hospital. This recommendation can be promoted by a transition game which will be a fun way to educate patients and help them develop skills they will need when they transition to the adult hospital.

At Ahus, the process of transition starts as early as when patients turn 12. Then they are transferred to a youth division which was established to give patients a softer transition from the safe environment that the children’s clinic provides, to the much harsher reality of an adult hospital (Rambøll, 2012, p. 89). By the time patients get 18 years old, they are supposed to have completely transitioned to the adult healthcare system. But the transition doesn’t stop when the patients turn 18. They still need to go through an adjustment phase where they have to get used to the new ways of receiving medical care and the fact that they are now responsible for themselves, which is why patients up to 25 are still included into the final phase of the transition. As mentioned before, Ahus offers its teenage patients two check-lists, “My Health” and “Ready for transition” (“Brosjyrer,” 2016), that they can fill out to make sure that they have become independent and are ready for transition. The KULU project has
already done research on these check-lists and Aasen’s (2014) thesis explores the possibilities of a transition app. These check-lists will serve as the transition and the learning element in the game, and are something that I am going to, through this master project, find out how to implement into the game in a fun way.

1.3 Games

The research question explicitly asks whether games can prepare for transition, which makes it crucial to define what a game is. However, that is not an easy task since there is no one unison game definition that everyone uses (Brathwaite and Schreiber, 2008; Salen and Zimmerman, 2003; Schell, 2008).

Schell (2008) starts off with saying that a game is: “something you play” (2008, p. 26). But as this is a very broad definition and could be applied to things that are not games, such as an instrument for example, it needed to be narrowed down. Through examination of various definitions, Schell (2008) concluded that games: are entered willfully, have goals, have conflict, can be won and lost, are interactive, have challenge, can create their own internal value, engage players and are closed, formal systems.

Brathwaite and Schreiber (2008) agree that a game is a form of play, but one that has rules and often involves a conflict. Further, they point out that most of the games have goals, defined start and end points and involve decision making on players behalf (Brathwaite and Schreiber, 2008, p. 5).

Salen and Zimmerman (2003) also stress the connection between play and game, and through comparison of seven different definitions, end up with a definition of their own: “A game is a system in which players engage in an artificial conflict, defined by rules, that results in a quantifiable outcome.” (Salen and Zimmerman, 2003, p. 80). Which basically means that games are something that a player plays, and while doing it, makes choices that have outcomes, that all occur in a game-system that supports meaningful choice-making (Salen and Zimmerman, 2003).

Koster (2013) defines a good game as: “one that teaches everything it has to offer before the player stops playing” (Koster, 2013, p. 46). He expands his definition by pointing out that games have characteristics of presenting us with models of real things that are often highly abstracted, being generally quantified models, teaching us things that we can absorb into the
unconscious and mostly teach us about things that are fairly primitive behaviors (Koster, 2013).

After reviewing these definitions, I have chosen my own definition of games to the following: *A game is a system that is defined by rules, has goals and a conflict, engages players in an activity that can be won and lost, and keeps the player entertained while teaching at the same time.*

The categories that are used when describing the elements a game consists of, also lack a unison agreement. There is however a Mechanics, Dynamics and Aesthetics framework that was originally developed by Hunicke et al. (2004) as a way of formalizing game design and research on game design. Schell (2008) proposes four basic elements that he calls for *elemental tetrad* and that consists of: mechanics, story, aesthetics, and technology. Mechanics are the procedures and rules of the game, and at the same time they describe the goal of the game. The story is the sequence of events that appear in the game, either linear or branching. The aesthetics is how your game sounds, looks, and feels, and is the element that has a direct relationship to the players’ experience. Technology in this sense is any material that makes the game possible, everything from pen and paper to a computer. Schell (2008) stresses that the four elements are equally important as well as interrelated and cannot be treated separately when designing a game.

In this master project, I am going to focus on computer games that you play on a screen. This means that other types of games, such as board games, card games, console games, and handheld games are outside the research context. As the focus of my study is to find out whether a game can prepare teenagers with health issues for their transition, I will have to find out which game elements should be a part of a transitional game and what should the goal of such a game be.

A game can have several main goals, it could simply be fun and entertaining in itself, like many computer games nowadays, it could be educational or it can even be a mixture of those two as Danielsson and Wiberg (2006) try to make use of in their own research. It can also be used to prepare teenagers for the transition by, among others, providing them with a sense of security by informing them about which rights they have as a patient, making the transition itself more fun and enjoyable, creating a sense of community (by enabling a multi-player option), making the process easier for them or educating them more around the transition itself by presenting the guidelines and step by step description of the process, and finally by
showing them what it actually means to go over to an adult hospital. The aspect that I want to focus on through this master project is for the game to be fun for its players and at the same time teach them something about the transition and in that way prepare them for a better transition.

1.4 Context of the research

Löwgren and Stolterman (2004) speak of design as a social process and introduce a three-layered structured that they call “the three circles of involvement”, see Figure 1.1, as a way of sorting out the stakeholders in a project.

![Figure 1.1 The three circles of involvement reproduced from Löwgren and Stolterman (2004, p. 33)](image)

Löwgren and Stolterman (2004) named the three layers: core, periphery and context, where the core in this master project represents the main researcher (me), my mentors and the young people that have participated in my project. At the periphery are all other stakeholders i.e. teenagers with long term health challenges that will go through a transition and the medical personnel that will be involved in that process, as well as the KULU project that my master project is an active part of. While at the context, there is the entire body of research that already exists on my research topic together with the medical community, as well as my University.

The reason for including the three circles of involvement is to show that my master project is not a single unit and that the decisions I have made have been influenced by other factors. As
such, my master project was a part of the Design Stations design strategy employed by van der Velden et al. (2016) in their research, as well as a transition theme that relates to Youth Councils’ previously expressed wishes for improved self-management. The Design Stations design strategy was employed during the first design workshop that was held at Ahus, and its execution will be described in chapter 4.

The research that I am going to conduct is going to focus on all young adults with long term health challenges that are going to experience a transition or are already in the transition process, without focusing on a specific illness. These are all potential users of the game whose design I am going to focus on throughout my master project. Target group in my study are current members of the Youth Council at Ahus that are between 15 and 22 years old, because they are collaborators in the KULU project, but also because the transition process usually last over a period of time. This way, I will get the perspective from those who still haven’t gone over to the adult hospital as well as those who have been transferred relatively recently and are currently going through an adjustment phase.

1.5 Overview of chapters

The purpose of this study has been to find out whether a game can be used to prepare teenage patients for their transition from children’s clinic to the adult health care. In the remainder of this thesis, I will present the following chapters:

Chapter 2 Existing research: This chapter will look at previous research conducted on health games designed with and for teenagers, as well as current interventions that have been done to modernize the transition.

Chapter 3 Theory and Methodology: Here, the theoretical framework that has been used, which is game design, shall be explained. Also, the research methodology will be explained, that is Participatory Design, as well as the previous research on the design with teenage patients will be presented. The chapter will end with a section on ethics, and how they are particularly important when designing with teenage patients.

Chapter 4 Methods and design process: In this chapter, I will present the methods that I have used to collect the data, how the methods have been used, as well as results of each workshop. Also, the entire design process shall be described here.
Chapter 5 Data and Analysis: This chapter will present the collected data through thematic analysis, and the use that as starting point to analyze the finding with the help of *A Deck of Lenses*.

Chapter 6 Discussion: Here I will discuss my findings and compare them to other related research that has been done on the similar topics.

Chapter 7 Conclusion: In this chapter I will sum up the thesis and answer the research question.
2 Existing research

The general media and the public have had a negative attitude towards digital games especially violent computer games (Gaupset, 2001; Helseredaksjonen, 2008; Kjærvik, 1995; Koppegård, 2011; Mann, 1998; Viken, 2004). But in the recent years, researchers have discovered advantages when it comes to reaching today’s youth through games, either by educating them (Danielsson and Wiberg, 2006; Khaled and Vasalou, 2014) or by helping them in various ways such as improvement of skills (Tan et al., 2011), self-management through knowledge (Beale et al., 2007; Glasemann et al., 2010), after cancer treatment (Gerling et al., 2011; Kayali et al., 2015) and many more ways.

Since the games are already a part of the young people’s lives, it is interesting to see if games have been used in a health context so far and if so, what kind of advantages they can provide to its players.

Current research reviews show that games have become a popular medium to engage children and teenagers in health care issues (Baranowski et al., 2008; Primack et al., 2012). This includes various types of games such as computer games, mobile games, tangible tabletop games and exercise video games (exergames). These games are being designed for and with both healthy youth and youth with chronic health challenges. A review done by Primack et al. (2012) shows that when it comes to the improvement of health, studies have shown that video games are eligible as a way of providing psychological and physical therapy, improving disease self-management, health education, pain distraction, skills training for clinicians and increased physical activity.

Research done on StarBrightWorld has shown that one of the reasons that young patients engaged in the participation of that particular online network, was the possibility of playing the games because they were perceived as fun (Nicholas et al., 2007, p. 209). The benefits from playing games on StarBrightWorld proved to be therapeutic for some participants, where one patient in particular imagined shooting his cancer cells (Nicholas et al., 2007, p. 213) in the same way as the game Cytarius was designed few years later (Gerling et al., 2011).

Wilson and McDonagh (2012) discuss the importance of computer games in health and point out that there is a lack of games that can be used by young people with health challenges during transitional care. They recognize that young persons and clinical care team considered
these areas as important in determining transition readiness: disease specific, psychological health, generic health, healthcare utilization, social issues, education, vocation and independent living (2012, p. 545). Game characteristics that could lead to transitional care skill attainment are: goals, feedback, rewards, challenges and curiosity (2012, p. 546).

2.1 Existing games

Table 2.1 shows an overview of some of the existing health-related games that have been designed for children and young adults. The Game column indicates the name of the game or the placement of several games such as BUK games at Ahus and mini-games in StarBrightWorld. Age represents the target group for the game, or when in parenthesis () the age used in the research. Illness describes which type of illness the game is focused on, or whether it is a general game and not designed for a specific illness. Motivation behind these games depicts what type of focus the authors had when designing the game. Game type shows what type of game it is, while Game purpose points at the planned outcomes of the game. NF in the table stands for Not Finished and means that during the research a paper prototype was used or designed with participants instead of a finished game and NN stands for No Name and was placed where a game or a series of games didn’t have a name.

<table>
<thead>
<tr>
<th>Game</th>
<th>Age</th>
<th>Illness</th>
<th>Game type</th>
<th>Game purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUK games</td>
<td>0-18</td>
<td>General</td>
<td>Mini-games</td>
<td>Fun</td>
</tr>
<tr>
<td>StarBrightWorld</td>
<td>4-17</td>
<td>General</td>
<td>Mini-games</td>
<td>Fun</td>
</tr>
<tr>
<td>Re-Mission</td>
<td>(13-29)</td>
<td>Cancer</td>
<td>Psychoeducational game</td>
<td>Learning, self-care</td>
</tr>
<tr>
<td>Cytarius (NF)</td>
<td>(7-19)</td>
<td>Cancer</td>
<td>Casual game</td>
<td>Learning, discussion</td>
</tr>
<tr>
<td>INTERACCT game (NF)</td>
<td>(8-14)</td>
<td>Cancer</td>
<td>Serious game</td>
<td>Communication, treatment compliance</td>
</tr>
<tr>
<td>SIDES (NF)</td>
<td>(11-14)</td>
<td>Asperger Syndrome</td>
<td>Tabletop computer game</td>
<td>Social skills development/ support group work</td>
</tr>
<tr>
<td>NN (NF)</td>
<td>(6-11)</td>
<td>Cerebral Palsy</td>
<td>Tangible tabletop games</td>
<td>Support therapy, fun</td>
</tr>
<tr>
<td>Liberi (NF)</td>
<td>(12-18)</td>
<td>Cerebral Palsy</td>
<td>Action-oriented exergames, mini-games</td>
<td>Support therapy</td>
</tr>
</tbody>
</table>
BUK has their own web site provided by Ahus, where they have information adjusted for patients in the age ranges 0-5 years, 6-12 years and 12-18 years. They provide the patients with four same games that all patients up to the age of 18 can play, but the level of the games is rather appropriate for children and not quite suitable for teenagers (Akershus universitetssykehus, 2015).

StarBrightWorld is an online resource for ill children. It allows interaction between patients and education through various activities that amongst others include games. These games are arranged as mini-games and everyone that is a part of the StarBrightWorld community has access to them (Nicholas et al., 2007).

Re-Mission is a game that was created to change the illness representations of young people undergoing cancer treatment. The reason for that was to promote adherence to self-care through improved cancer-related knowledge and self-care skills. By observing the consequences of their characters in the game, the players could draw lines to the real world situations (Beale et al., 2007; Kato et al., 2008).

Cytarius is a game that uses different types of cancer and treatments as game mechanics, and is set in a science fiction world. The goal of the game is to teach the patients about their disease and what are their treatment options (Gerling et al., 2011).

INTERACCT game is a part of a communication platform for children recovering from cancer. Their goal was to develop a game world that will appeal to young target audience, that will in turn promote communication, stimulate physiotherapy exercises and treatment compliance (Kayali et al., 2015).

SIDES is a cooperative tabletop computer game for social skills development made for teenagers with Asperger’s Syndrome (Piper et al., 2006).
NN (no name) is a final game concept that consists of a colored hammer game, colored block game and rotating colored block (Li et al., 2008).

Liberi is an action-oriented exergames designed for children with Cerebral Palsy (Hernandez et al., 2013).

Squire’s Quest is a ten-session, interactive multimedia game where each session last 25 minutes. The goal of the game is to increase children’s intake of fruit, juice and vegetable through educational sessions in the game, but also by inspiring the players to become a knight in the game that is achieved by helping the king (Baranowski et al., 2003).

‘Food Quiz’ is a mobile game about carbohydrate counting developed with and for young people with diabetes (Glasmann et al., 2010).

Village Voices is a four-player game set in a fictional village during the pre-industrialization time that teaches conflict resolution skills to children (Khaled and Vasalou, 2014).

His and Hers is an educational computer game that was designed with and for teenagers. It is a game where teenagers are encouraged to reflect upon gender issues (Danielsson and Wiberg, 2006).

2.2 Health games

A health game differs from a commercial game in the way that it, in addition to being entertaining, is health-related in some way. This is similar to the serious game concept as it often combines entertainment with a learning element. A health game can be a serious game as well as it can combine fun with a health-related goal. Health-related goals differ from regular game goals as they are meant to help the players with their health challenge in addition to entertaining them.

A game that somehow addresses transition does not exist yet. This is why I chose to look at other health games that have children and teenagers as their target group and search for what is important when designing a health game. What I discovered is that it is important to consider issues such as age, gender, health challenge, the health-related goals and the type of design that is commonly used, which is what I will discuss in this section.
2.2.1 Age

While some health games that have been designed focus on youth as a target group (Gerling et al., 2011; Glasemann et al., 2010; Miller et al., 2013), others choose to focus their game on either children or teenagers. Research has shown that children and teenagers wish for different elements in a game, and what seems fun and enjoyable for a twelve year old is not necessarily as entertaining for an eighteen year old (Kayali et al., 2015; Tan et al., 2011).

Gerling et al. (2011) evaluated the game prototype Cytarius and found out that kids and teens with cancer enjoyed playing it, but that there were some age-related differences due to the age range of the participants being between 7 and 19.

Then again, the cancer game Re-Mission has shown that it is quite possible to design a game for as wide range as 13 to 29 years and still be successful in achieving its goals (Beale et al., 2007; Kato et al., 2008).

2.2.2 Gender

Gender seems also to be an important issue to consider when designing a health game, which is something that both Miller et al. (2013) and Kayali et al. (2015) discovered during their research. Kayali et al. (2015) designed a serious game for and with children ages 8-10, and teenagers 12-14 suffering from cancer. What appeared to be a common feature is that boys from both groups preferred mainly weapons and fighting, while girls favored a coherent story line that evolved around relationships between the characters (Kayali et al., 2015). Miller et al. (2013), on the other hand worked with adolescents to create concepts for health games, and observed a similar gender effect where the games could be sorted into following categories: highly masculine, mildly masculine, mildly feminine and highly feminine. On the other hand, in a survey done by Kutner and Olson (2008), when it comes to types of games that middle-school children like to play, action games are almost equally preferred by both boys and girls.

2.2.3 Health challenge

When it comes to whether a young person has a chronic health challenge or not will not affect what kind of games they like to play (Hernandez et al., 2013). It may impose some physical challenges on them if it is an active game that requires lots of movements, but it is still
possible to design such a game as long as you limit it to one target group and focus on their possibilities like Hernandez et al. (2013) have done in their research.

What makes a health game that aims at several illnesses at the same time particularly difficult to design, is because of the many variations in illnesses. Wilson and McDonagh (2012) therefore propose that the games should be disease specific and provide players with disease education i.e. rationale for treatments and explain potential side-effects, and aid in increased pain management and self-management. This complies with current research about health games where the only games that are not illness specific are web-based resources such as Ahus site for BUK (Akershus universitetssykehus, 2015) and StarBrightWorld (Nicholas et al., 2007). They have games incorporated into the websites as a side function, meaning that they don’t have anything to do with health, they are just regular games that could be played by all children and young adults. An example of the games is the “memory” game that BUK has on their website amongst others.

2.2.4 Goals in health games

The most common goals that appear in health games for youth are: education/learning, communication/discussion between patients, their parents and medical staff, self-management and self-efficacy, and treatment compliance and behavior change that leads to self- or health-improvement (Wilson and McDonagh, 2012). These goals are often intertwined and several goals tend to appear together in one and the same game. The goals that often appear together are: learning and self-management, communication and support of treatment, and behavior change and health improvement. When it comes to goals such as fun and entertaining, they are either set directly or indirectly, but they are a necessary part of a game (Baranowski et al., 2008). On some occasions, researchers discuss edutainment as a goal for games that incorporates education into entertainment (Danielsson and Wiberg, 2006; Glasemann et al., 2010).

2.2.4.1 Learning/Self-management

Learning seems to be a reoccurring goal when designing health games for young people (Beale et al., 2007; Danielsson and Wiberg, 2006; Gerling et al., 2011; Glasemann et al., 2010; Khaled and Vasalou, 2014). Research has shown that games can significantly improve knowledge about an illness and its possible treatments, amongst their players (Beale et al., 2007; Kato et al., 2008). While Beale et al. (2007) compared Re-Mission with a regular
commercial game, Kato et al. (2008) focused solely on the use of Re-Mission versus no game and gathered the same results. As well as increase in knowledge, the players exhibited a substantial adherence to their treatment and cancer-related self-efficacy, compared to the group that didn’t play a game (Kato et al., 2008).

2.2.4.2 Communication/Support treatment

A game can support the treatment of young patients in several ways. While Piper et al. (2006) worked with teenagers that have Asperger’s Syndrome to design a tabletop computer game for social skills development, Li et al. (2008) saw the potentials of tabletop games in supporting therapy of children with Cerebral Palsy. Kayali et al. (2015) on the other hand researched on developing a game-based tool as a way of encouraging communication between children and clinicians to stimulate physiotherapy exercises and improve treatment compliance.

2.2.4.3 Behavior change/Health improvement

A study conducted by Warburton et al. (2007) has shown that playing interactive video games, as a way of exercising, is more motivating than a traditional aerobic training and leads to bigger improvements in health-related physical fitness. Miller et al. (2013) build further on that notion and stress the importance of pervasive social health games as a way of adolescent obesity prevention. They have shown through their study that adolescents seemed eager to design such a game, and focused their study on finding design strategies when designing a health game for teenagers without health challenges.

Two other studies were concerned with promoting healthier behaviors and had children instead as their target group. They researched the possibilities of using video games to increase water, vegetable and fruit intake, and promote physical activity (Baranowski et al., 2011, 2003). Baranowski et al. (2011) compared two games against commercialized games and found out that it resulted in an increase in fruit and vegetable intake, while Baranowski et al. (2003) compared playing a diet and physical activity game called Squire’s Quest versus not playing a game at all that resulted in the same increase of fruit and vegetable intake, as well as an increased juice intake.
2.2.5 How to design a health game

On the matter of how to design a health game, the studies that were presented in the previous section seem to indicate that it is necessary to involve potential users when designing a health game. In the case of games for children and teenagers, one must include participants from that group and find the best way that they can participate in the design process. There are two different strategies that have been employed in most of the reviewed literature. On the one hand, the users are considered co-designers and the researchers employ a Participatory Design (PD) approach (Danielsson and Wiberg, 2006; Khaled and Vasalou, 2014; Tan et al., 2011). On the other hand, the users are used to gain feedback about the design i.e. the user-centered design (UCD) approach (Gerling et al., 2011; Glasemann et al., 2010; Kayali et al., 2015; Li et al., 2008; Piper et al., 2006).

Some researchers (Gerling et al., 2011; Glasemann et al., 2010; Li et al., 2008; Piper et al., 2006) stress the importance of involvement from health-personnel that have experience with that particular illness or that are involved in the treatment when designing a game for youth with a health challenge.

2.2.6 Success criteria

There are different game elements that emerge as important in the reviewed health game research. Miller et al. (2013) found out that social presence, incentives, gender effects and completion are important characteristics to consider when designing a youth-focused, pervasive, social, health game, since those were the reoccurring factors during their entire research study.

Others, such as Kayali et al. (2015), stress the importance of the game allowing for different play styles if designed for a larger age range.

Gerling et al. (2011) on the other hand, discovered that when infusing a game with health related content, it is necessary to provide a strategic game that can help the users battle their illness.
2.3 Transition interventions

In the KULU project, there are several design projects that have focused on transition, for instance: Transition app, Timelines, Health rights and Transition cards (van der Velden et al., 2016). The Transition app project was the most comprehensive one and it resulted in a working app that can be downloaded from the App Store (“KOOL on the App Store,” 2016).

Zhao et al. (2015) designed a transition app that implemented the following functions: reminder, mood and health, feedback, help contact and memo. Even though they didn’t make the design of the app with users, they were still able to identify different types of users that will be using their app. Their results show that their app was useful in aiding at self-management and that it reminded the patients about important activities so that they didn’t have to think about their illness at all times (Zhao et al., 2015).

2.4 Recap and reflections

In summary, games have become popular in the health context, particularly when it comes to the younger patients. Current health games are disease specific and it is important to consider issues such as age, gender and the health challenge of the target group. A transition game doesn’t exist, but Wilson and McDonagh (2012) discovered that a computer game that helps with transition should have: goals, feedback, rewards, challenges and curiosity.

As we can see, goals that the reviewed health games often combine together are: learning and self-management, communication and support of treatment, and behavior change and health improvement, in addition to fun.

When designing a health game, it is common to involve the potential users in the design process. If the game is disease specific, it is also important to include health-personnel that have thorough knowledge about that disease and its treatment.

As the focus of my research is transition for all young adults regardless of their health challenge, designing an active game like Hernandez et al. (2013) did is challenging because they limited their target group to cerebral palsy and made a game that is not as entertaining or
possible for all young people with health challenges. It is also more useful to involve health-personnel that is responsible for the transition instead of disease specific ones.

None of the mentioned authors have researched on whether a game can prepare teens for transition. What is known is that games have been used successfully to help teens learn more about their health and in that way achieve better self-management (Kato et al., 2008), aid in better communication between patients and health personnel and through that support their treatment (Kayali et al., 2015), but also lead to health improvement through behavioral change (Baranowski et al., 2003). This master project will focus on finding out whether a game can be used to teach the teens about the transition in order to prepare them better for the transition itself. In that way, the goal of the game will be to teach the teens about the transition and help them transfer the responsibility of their own health management from their parents or other caregivers onto themselves.
3 Theory and Methodology

In this chapter I am going to present the theory that I will use in this master project, which has implications for the type of research that I am going to conduct as well as the methodology.

3.1 Game design

The theory that I have chosen to use as a lens throughout this master project is the theory of game design. Similar to the game definition, there is no one unified theory of game design (Schell, 2008). Several theories exist and my choice is dependent on my definition of game design, which is also somewhat ambiguous in the research community.

Salen and Zimmerman (2003) define game design as: “the process by which a game designer creates a game, to be encountered by a player, from which meaningful play emerges” (Salen and Zimmerman, 2003, p. 80). To be able to understand this definition, it’s important to be on the same page about what is meant by meaningful play. According to Salen and Zimmerman (2003), there are two ways of defining meaningful play: descriptive and evaluative. Descriptive definition defines meaningful play as when a player takes an action that results in an outcome in the game, while the evaluative definition demands that the relationships between actions and outcomes are discernable and integrated into a larger context, meaning that a player can perceive the outcome of an action while the action is integrated into the game as a whole (Salen and Zimmerman, 2003).

Another definition of game design, is provided by Brathwaite and Schreiber (2008) who describe it as a process where the designer creates the content and the rules of a game, which in turn allows the player to make meaningful decisions that can affect the outcome of the game. Designers create meaning in a game when they allow the players to make a choice in the game that will affect the outcome, meaning that there has to be several meaningful options that the players can choose from (Brathwaite and Schreiber, 2008). A good game designer creates goals that the players want to reach and rules they need to follow, as well as being player-centric, which means that the players should be motivated by gameplay to go where the designer wants them to go (Brathwaite and Schreiber, 2008).
Schell (2008), on the other hand, has a more simple definition where he defines game design as deciding what a game should be. What he means by that is that when you design a game, you have to make many decisions along the way, that will together constitute your game. He also points out that the most important skill one needs to possess when designing a game is thoughtful listening, which you can achieve by observing everything and constantly asking questions. He continues on explaining that there are five kinds of listening that are necessary in order to design a good game, and they are: team – people you are building the game with; audience – people who will play the game; game – meaning that you get to know your game inside and out; clients – the people who are paying you to design the game; and self (Schell, 2008). My client in this context will be my mentors that will offer their opinions both on the game itself but also on the approach that I will use to design it, while people that will help me design the game, which in this case is the Youth Council and anyone who will participate in the design activities, will be both my team and representatives from my audience.

Schell (2008) has also gathered rules and practices that are common among game designers, and took a step towards creating a unified theory. In order to have good game design, Schell (2008) proposes use of many different perspectives that he turned into 100 lenses. He made cards representing each of the lenses and put them into A Deck of Lenses that comes with his book The Art of Game Design: A Book of Lenses, see Figure 5.3 for an example of the cards. These cards contain a small set of questions that should be used when examining one’s design, which he explains more thoroughly in his book. As he points out, there is no one “all-seeing” lens that designers can use when designing the game, as well as none of the existing lenses are complete or perfect. Instead, each of the lenses can be used to get a unique perspective on the design, and depending on what kind of game you are designing, some of the lenses will be more useful than the others. Schell (2008) proposes to use a wide variety of the lenses as possible, and use them as you please, or rather, the ones that are most useful for your game. This is the approach that I will use to examine and further develop the transition game.

Another approach that is known in game design, is the use of heuristics. Heather Desurvire has, among others, worked on development of heuristics that can be used in game design, and has published several iterations of the heuristics where the most recent one was done in collaboration with Charlotte Wiberg. Together, Desurvire and Wiberg (2009) present a set of game usability heuristics called PLAY that they propose should be used when evaluating and designing better games. The use of these heuristics were considered for this thesis, but
ultimately dropped in favor for Schell’s (2008) *A Deck of Lenses* as they are more focused around creative game design rather than verification and evaluation of games.

### 3.1.1 User Experience

In the field of Human-Computer Interaction (HCI), we often hear about user experience (UX), which in my case will be the experience of the teenage patients. But as they are the ones that will use the game in the end, it is relevant to talk about what kind of experiences they will get from the game.

So what do we mean by user experience? Preece et al. (2007) define user experience as: “[…] how people feel about a product and their pleasure and satisfaction when using it […] It includes their overall impression of how good it is to use […]” (2007, p. 15).

A very important note that must be made, according to Schell (2008), is that the game is not the experience in itself but that it rather enables its players to have an experience, which corresponds with Preece et al.’s (2007) statement that you can’t design an experience but that one rather designs for an experience. This is why it is important to test along the way what kind of experiences the players will get while playing the game. In this project, the goal is for the teenage patients to have fun while playing the game but also experience a learning process that will all together lead to them experiencing a sense of being better prepared for their transition. Schell (2008) proposes to find out the essential elements that define the experiences and then make them a part of the game. A good way to start is to employ his first lens, which is *The Lens of Essential Experience*.

The way to go about evaluating user experiences is to set user experience goals. Preece et al. (2007) give names fun, helpful, entertaining as some of the positive goals, and boring, frustrating and annoying as some of the negative ones. The game that I will design through this project has, as mentioned before, goal of being fun and educational, but these terms can be even further broadened by providing a narrower definition through other user experience goals, but also by the use of lenses.

### 3.1.2 Fun

Fun is a subjective perception and as Koster (2013) points out: different people will consider different things to be fun. This is why two different persons can experience the same game
differently. Fun in games arises out of mastery and comprehension, and what makes games fun is the act of solving puzzles according to Koster (2013). He also makes a strong statement comparing learning in games with drug, meaning that as long as the game is teaching us something, we’ll have fun and keep playing it, but when we stop learning, it will become boring. This is why it is important for games to balance between deprivation and overload of information in order for players to keep having fun (Koster, 2013). IJesselsteijn et al. (2007) formulate the issue in terms of a balance between the challenges that the player meets and the skill level. Carroll and Thomas (1988) also agree that there needs to be a balance, proposing that things are fun when we think that they are going to be of moderate complexity and then conclude that they are so. Koster (2013) summarizes it into the statement that games are teachers, while learning is fun.

Carroll (2004) claims that things are fun when: they keep our attention by arousing emotions, surprise us and present challenges. She continues on with saying that: “The possibility of fun arises when we are both aroused and intrigued, and at the same time recognize an intention to communicate through a design.” (Carroll, 2004, p. 39). She adds on saying that: “Fun is not the culmination for usability.” (Carroll, 2004, p. 39), meaning that fun should be incorporated into the considerations for usability.

Schneiderman (2004) on the other hand, talks about fun-filled experiences and defines them as playful and liberating, a break from the everyday lives that can be caused by either a physical activity or a mental challenge.

Nicole Lazzaro (2004) has through observations studied what players experience while playing a game and what makes them want to play games, and she discovered something that she calls Four Keys to More Emotion Without Story, but which is commonly known as the four keys to fun. The four keys represent four clusters of emotions that can be recognized through players’ face expressions and they consist of: hard fun – creating an emotion through a pursuit towards a goal; easy fun – sheer enjoyment through playing the game; altered states – aspects in the game create the emotions inside the player; and the people factor – games serve as a mechanism for interaction with other people (Lazzaro, 2004).

Koster (2013) has a similar breakdown of fun, which consists of: fun, aesthetic appreciation, visceral reactions and social status maneuvers. Where Lazzaro (2004) claims that all four of the keys can be recognized in successful games, Koster (2013) only considers the act of
mentally mastering a problem as the most important definition of fun which corresponds to Lazzaro’s key hard fun.

A game, from the player’s perspective, can be experienced as ‘fun’ or ‘not fun’, while from the designer’s perspective, fun needs to be decomposed in order to find out what makes a game fun (Winn, 2009). A good way to do this is by employing one of Schell’s lenses, namely The Lens of Fun, which I will talk more about in chapter 5.

3.2 Qualitative research

Type of research that I am going to employ in my research is qualitative research. Myers (1997) claims that the main motivation for doing qualitative research comes from the fact that humans differ from the natural world through their ability to talk. He further explains that the goal of qualitative research is to help researchers understand people and the cultural and social context that they live in (Myers, 1997). Both qualitative and quantitative methods exist within qualitative research, but during my research I am going to focus on qualitative methods. This means that I am going to gather qualitative data as a way of answering my research question.

The reason why I chose qualitative research for my master project, is because it will enable me to collect data that will help me answer my research question, which is: “Can we use computer games to prepare young people with long term health challenges in their transition to adult health care?”. As I mentioned before, a transition game does not currently exist, which is why it is not possible for me to use one to conduct a quantitative research where I could explore whether teens that use a game are better prepared for a transition than those that don’t use a game during their transition. This would also require a long-term study that lasts over several years and has a large number of participants that will participate in the study, which would be better suitable for a doctoral dissertation rather than a master thesis. But as it is, in order to explore the possibilities of a transition game, I need to design a game from scratch, which is why I will use the theory of game design to design a fun and educational health game. By taking a qualitative approach, I can go into depth to find out what teens consider to be fun in games as well as discovering how to implement the transition element to make it an educational game. This way, instead of generating data that can help me generalize the opinions of the teens that will answer the question whether teens consider a game to be
useful to prepare the during a transition, I want to find out what teens consider to be a fun game for use during the transition process.

3.3 Methodology

There are several methodologies that can be used to answer my research question. The two ways that researchers currently use the most when researching on the transition and health games, are User Centered Design (UCD) and Participatory Design (PD) - they both include future users in the design process.

UCD, also called ‘human-centered design’ and ‘usability engineering’, is an approach that Maguire (2001) characterizes as a design process that incorporates users view on a system to achieve usability. Its primary concern is to involve users through the various stages of the development process, and use them to understand their requirements to the system and to get feedback on systems’ usability (Maguire, 2001).

PD considers users as co-designers and is defined by Robertson and Simonsen (2013) as: “a process of investigating, understanding, reflecting upon, establishing, developing, and supporting mutual learning between multiple participants in collective ‘reflection-in-action’” (2013, p. 2). They go on with identifying 4 main characteristics of PD, which are: taking a stand, participation, practice, and design (2013, pp. 5–9). On the other hand, Bratteteig et al. (2013) identified situation-based action, having a say and mutual learning as main aspects of PD. Kensing and Greenbaum (2013) go further and present a set of principles that PD projects should build upon, and they are: equalizing power relations, democratic practices, situation-based actions, mutual learning, tools and techniques and alternative visions about technology.

Main difference between UCD and PD is showed by Sanders and Stappers in their article Co-creation and the new landscapes of design (2008), where UCD on one hand treats the users as a “subject”, while the PD approach considers the users as a “partner” (2008, pp. 5–6). This means that when a designer makes use of a UCD approach to create something, he or she is the one that makes the decisions and decides how the design is going to be like. Users are included during the design process to test if they think the design is understandable and intuitive to use, but it is still the designer that has the final saying. PD on the other hand, treats users as co-designers and designers together with users come up with design proposals. The main difference is that where users have a voice in UCD, they don’t have a say which is one
of the key elements in PD (Bratteteig et al., 2013, p. 129). But Sanders and Stappers (2008) also make a point that UCD and PD approaches are influencing one another and the methodologies are becoming more intertwined.

There are several ways a researcher can include children and young adults into the design process, and Druin (2002) sorts them into: user, tester, informant and design partner. She claims that when children get involved into the design process they will feel empowered and this empowerment will vary according to which role the children have (Druin, 2002). Each role has its strengths and weaknesses, and the amount of involvement increases for each role. In PD, the ideal role that the participants can have is the role of the design partner, but that demands a great amount of involvement that teenagers with health challenges do not have.

Another issue is the ethical consideration, which is asking the question: How much time is ethical to demand from teenagers with health challenges? Because of this, many researchers choose to assign the role of a tester to their participants when developing a health game for young people, and especially children, as we have seen in the previous chapter.

Danielsson and Wiberg (2006) had involvement from potential users when developing a game and called it for Participatory Design without it meaning a long-term study where users are included all the way, but where it is equally important to have a panel of representatives from the target group that will voice their opinion and have a say, at least early on in the process.

### 3.3.1 SHARM framework

In the KULU project, we use an approach called the SHARM framework, which is something that I will also use in my master thesis, particularly during the design phase. SHARM stands for: situation-based action, having a say, adaptability, respect and mutual learning. It’s based on three main PD principles which are situation-based action, mutual learning and having a say, while adaptability comes from research by van der Velden and Emam (2013) and Sommervold and van der Velden (2015). Respect represents the fact that the teenage patients wish to be treated like the experts of their own health situation and as young adults first, rather than patients (van der Velden et al., 2016).

Considering that I need to design a game that teenagers with health challenges would want to use, the teenagers need to be involved deeply in the design process as they possess knowledge that is unique to their life situation. This is why exactly PD is an appropriate approach for my master project. It will also lead to a greater feeling of ownership among participants that will
be more inclined to use the game. Furthermore, it will enable mutual learning, meaning that I as a researcher will get a better understanding of my target group’s expectations and needs, where they on the other hand will learn which limitations technology sets for their wishes. This constant involvement from potential users will help keep me from going into the trap of forgetting who I am designing for and keep me focused on my task. But most importantly, I won’t be the only designer in this project, I will have a couple of co-designers that will help me generate ideas for the game as well as making sure that I fulfill one of the main requirements of SHARM, that I mentioned earlier, which is having a say. Situated-based actions will be taken at the participant’s natural environments, such as the hospital, classroom or home, since these are all potential places where the teenagers can play the game. The methods shall be designed in a way that can appropriate for changing number of participants, but also in a way that everyone can participate no matter what health challenge they have to support the adaptability principle. Respect can be achieved by taking the suggestions from the teenagers seriously and thanking them for their help as experts on being teenagers.

The experience of an other researcher who wrote a master thesis for the KULU project was not overly positive when it comes to the number of responses one gets when reaching out to patient organizations by yourself (Machniak, 2013). I am therefore glad for involvement of the Youth Council. Having this possibility will make the recruitment process much easier, but still, only being available to co-design with these teens once or twice makes it very difficult to have future users participate throughout the entire process.

3.3.2 The design process

The design process that I will use as a starting point when researching on the design of the transition game is illustrated in Figure 3.1, and is the use-oriented design cycle which is one of the proposed design processes by Bratteteig et al. (2013).
The first phase of the project was dedicated to exploring the “real life problem situation” and “understanding practices”, which was reading up on the current literature on transition and health games. Based on those findings, the second phase will consist of methods that will enable me to collect the data and identify the needs and the wishes of the target group, as well as describe the requirements for the game. Based on those data, I will concretize the game ideas and materialize them in the third phase. In the final phase, I will use the materialized ideas of the game to evaluate them and improve them.

3.3.3 The Thematic Analysis

In order to generate knowledge from the findings, I will analyze the discussions through the thematic analysis. Braun and Clarke (2006) claim that thematic analysis is a foundational method for qualitative analysis that can provide a rich and detailed account of the data. They further define thematic analysis as: “[...] a method for identifying, analyzing and reporting patterns (themes) within data.” (Braun and Clarke, 2006, p. 79). Thematic analysis is a recursive process that consists of the following phases: 1) familiarizing yourself with your data, 2) generating initial codes, 3) searching for themes, 4) reviewing themes, 5) defining and naming themes, and 6) producing the report (Braun and Clarke, 2006). The best way of familiarizing yourself with the data is by transcribing the audio recordings, and reading and then re-reading all the material that will be used in the analysis. Every sequence of the data should be coded, and the codes should be understandable and attached to the data extracts that
they represent. There is no recipe for how to choose and name the themes, but they should be chosen based on the frequency of the codes and in a way that will help the researcher to answer the research question. Every code should be placed under at least one theme. After the initial themes are found, one should go through the entire data set that is being analyzed, and see if there are some themes that have been missed or possibly remove or collate themes that are similar. A hierarchy of themes should be set up as a way of identifying the main themes in the data, and names of the themes should be revised so that they are short and punchy. The final step of the analysis is to produce a report based on the themes, and in that way produce a story that will help the researcher to answer the research question.

3.4 Designing with teenage patients

When it comes to designing with teenagers with longterm health challenges, there are several things that need to be considered. In the research of van der Velden and Emam (2013), they discovered that the teenagers consider themselves regular teens and don’t like to talk about their illness. While hospitalized, teens spend a lot of time to stay up to date on the internet and play games to amuse themselves and want to forget about their situation. When outside the hospital, the teens have very busy lives, and don’t like to be reminded that they or someone else is ill.

Culén and van der Velden (2013) worked with vulnerable users and present in their research, among others, the case of designing privacy with teenage patients. They point out that designing with young patients is perceived as difficult because of the challenges around ethical issues and consent, as well as self-esteem issues or not wanting to talk about their illness. This is something that they got to experience during their research, in addition to some other challenges such as cognitive and physical ability of the participants. They dealt with these challenges through flexibility and improvisations that required reflexive sensibility in order to find out how to design with vulnerable users and not just for. That means that they continuously reflected on their roles as researchers, as well as asking questions such as: “Why do we interpret the participants’ use and design practices in this particular way and not that way?” (Culén and van der Velden, 2013, p. 66).

Mazzone et al. (2008) participated in a project that had as a goal to develop an educational game that would help pupils reflect on their behavior. They involved teenagers as informants and found it problematic to involve participants that will design their own treatment.
Therefore, they focused more on the design objectives and less on the ultimate educational purpose of the game. During the design phase, they collected data from both regular teens and teens that had a health challenge as a way of collecting a richer amount of data in regards to the age group as well as a way of realizing the similarities and differences between the two groups. One of the biggest challenges they experienced with the group of disaffected teens, is that the design sessions got cancelled merely hours before because of the characteristics of the specific user group. The characteristics involved short attention span, low motivation, critical behavior and unpredictable attendance, which in turn influenced the strategies used when designing the methods used to design the game. Strategies such as work in small groups, defining simple tasks and objectives, and many short activities with immediate output proved to be the most effective ones in this project even though they differed from the author’s previous experiences where they noticed that older participants preferred more challenging and structured activities. But what they found that was similar and applicable for all teenagers, is that they need to get a sense of ownership and praise in order to understand the value of their inputs.

As these researches show, when working with teenagers that have health challenges, particularly hospitalized ones, the researcher needs to be flexible and improvise when it comes to design methods. Mazzone et al. (2008) discovered benefits in designing with small groups, while Culén and van der Velden (2013) found it nearly impossible to work with more than one patient at the time. Both van der Velden and Emam (2013) and Culén and van der Velden (2013) discovered that teenagers don’t like to be treated like patients, which poses a challenge when the focus of the project is, like in my case, to design a technology to be used by teenagers with long term health challenges. A way to solve this, could be to give the teens a sense of ownership and explain that they as experts can help others in that are in the same situation as themselves, like Mazzone et al. (2008) suggest.

Bowen et al. (2013) didn’t design with teenage patients, but they did discover that regular teenagers can get inspired and amused during the design phase if the activities have cultural references. And while cultural references really seemed to inspire the teens to develop the concepts, the authors discovered that not all references are equally good and that the teens preferred discussing their experiences and ideas directly, in the same way as Danielsson and Wiberg (2006) found that discussion is preferred over drawing. On the other hand, language games from popular culture can enable teens to understand the language games of design and in that way become involved in the design process (Bowen et al., 2013).
3.5 Ethics

Doing research with teenagers is particularly difficult because they are not children anymore, but not yet adults either. For this reason, ethical regulations surrounding them differ in different countries and different cases as Lang et al. (2014) disclose in their paper. Due to ethical challenges surrounding teenagers, they are usually left out of studies and adults represent them instead (Lang et al., 2014). Lang et al. (2014) propose strategies that researches should address when doing research with adolescents, in order to help them deal with the ethical challenges. The strategies consist of: consent, assent, gatekeepers, confidentiality, appropriateness of topic and proxies. Consent means finding out what the regulations are in your country and whether the participants in your study need parental consent or if they can give their own. Assent should be used when the participants can’t give consent on their own in order to provide the individuals with the feeling of control over participation. Appropriate gatekeepers should be used, such as teachers, when parents aren’t available or difficult to reach, to give the consent for the study and decide whether the research is suitable for the minor participants. Confidentiality means that the teenagers should get the same respect as the adults, and the researcher should clearly explain what will happen to the collected data and who will have access to them. Appropriateness of topics includes that the researcher should make an effort to make sure that the content and activities are appropriate for the target group, and actively involve teenagers or adults that are used to working with teenagers when planning the research. Use of proxies should be only considered if it is not possible or very difficult to have the ‘real’ users in the study.

In Norway, according to Norwegian Center for Research Data (NSD), it’s usual for 15 year old’s and upwards to give consent on their own, except when the research study collects sensitive data (“Vanlige spørsmål - Personvernombudet - NSD,” 2016). Sensitive data is defined as information about race or ethnical background, political or philosophical or religious attitudes, whether a person has been a suspect, on trial or convicted of a crime, health conditions, sexual relationships or memberships in unions (“Personopplysninger - Datatilsynet,” 2016). For a consent to be valid, it needs to be voluntarily, explicit and informed (“Krav til samtykke - Personvernombudet - NSD,” 2016). Since the health conditions are considered to be sensitive data, every health related research needs to be careful in what kind of data they collect. There are special ethical guidelines that the laws regarding collection of sensitive personal information are requiring when handling this
specific target group which limits the researchers to get personally in contact with them. The only way the contact can be established is by going to specific organizations and asking them if they are willing to participate. And then, if they say yes, they will further establish the contact with their own patients and ask generally if anyone is interested in participating in a project.

My mentor, Maja van der Velden has reported the KULU research to the NSD and has written a collective consent form for the collaboration between the KULU project and the Youth Council, see Appendix A.
4 Methods and design process

In order to collect the data to answer the research questions, I have organized two design workshops. The first workshop was held at Ahus together with some of the members from the Youth Council. The second workshop was held with teenagers from the same age group, but without any health challenges, at their own home.

The methods that I used were based on current research on design with and for teen patients, as well as a way to answer the research question, particularly the sub-question: *what kinds of methods are appropriate when designing a transition game with and for teenager?*

4.1 Workshop 1

The first workshop was held at Ahus together with members from the Youth Council. At the same time that I held my workshop, three other master students in the KULU project held their own workshops with the same participants at the same place. Since nine of the members from the Youth Council confirmed their presence, the plan was to have 3 groups of 3 participants each that will rotate between my station and the others. As Mazzone et al. (2008) suggested, and van der Velden et al. (2016) applied, the workshop was designed so that it consisted of short activities with immediate results, which van der Velden et al. (2016) called for Design Stations.

The way I prepared for the first workshop was by having regular meetings with the other members from the KULU project and getting feedback on my ideas. They also served as a pilot test before the actual workshop as I got an opportunity to try out my plans for the workshop on them first and adjust them as we discovered flaws. This was very important because I couldn’t get a second chance to include the Youth Council from Ahus into the design process, so I had to be sure to make the most of the time.

As the target group in my research is young people with long term health challenges, it demands special considerations as well as the fact that we had to be prepared that some of them might not show up at the workshop.
Each of us had 25 minutes to spend with each group, which we knew beforehand and was something that we prepared for. This limited the choice of method because some methods, such as Future Workshop, are nearly impossible to complete in such a short amount of time. Because of this, and the nature of my research question, I designed my own method that I used in the workshop, which combines the use of tools that I named The Needness Scale and Game Design Cards with a sorting technique.

4.1.1 The Needness Scale

The main goal of the workshop was to identify which game elements the participants consider to be the most important in a transition game, and also which elements should be omitted from the game. A simple way of visualizing that is by creating a scale that represents the two opposites, and also has a middle that represents the elements that the participants think is ok to be in a game but not overly thrilled about. This resulted in a laminated poster that had a scale printed on it ranging from “Må ha”, “Fint å ha” and “Trenger ikke å ha”, which translated to English means “Need to have”, “Nice to have” and “Don’t need to have”, see Figure 4.1, that I named The Needness Scale.

The choice to include this type of scale in my workshop was inspired by two master thesis previously written in the KULU project. One of them is the research done by Machniak (2013) where she uses the Cool Wall originally created by Fitton et al. (2012) that she redesigned to find out what teenagers consider to be a cool social website. The other one is the project conducted by Aasen (2014) where she created posters that represent what’s cool to have and what’s a must have in a transition app. As I found out from Aasen’s (2014) research, it was difficult for the participants that were in a wheelchair to reach the posters when she attached them to the wall. Because of that, I created a poster that could be attached to a table instead so that it is available to all the participants.
4.1.2 Game Design Cards (GDC)

Instead of just using post-it notes, as Aasen (2014) used to represent different elements, I decided to make laminated cards like Sommervold and van der Velden (2015) did, that could be placed on the Needness Scale and that would enable reuse with each group. This method I named Game Design Cards. It combines several tools and techniques and consist of a mixture of inspiration cards workshop, card sorting and a semi-structured group interview.

Inspiration cards workshop has been described as a method where designers use inspiration cards in a workshop to stimulate participants to create design concepts (Halskov and Dalsgård, 2006, p. 4). In order for the workshop to be successful, there are three key factors: familiarity with fellow participants, familiarity with creative methods and processes and insight into use domain (Halskov and Dalsgård, 2006, p. 7). Inspiration cards that Halskov and Dalsgård (2006) made are not specifically designed for games, so I made my own that were more suitable in this research context.

Card sorting is a method that involves a set of concepts, that are written on a card, that the participants sort into different categories in a way that makes sense to them. The point of
using this method is to find out what the users of a system consider to be related topics that further indicates how to structure a system in an intuitive way for the users (“Card sorting | Information & Design,” 2016). This method is cheap, as concepts can be printed or written on the regular paper; easy for participants to work with; and quick and easy to conduct, it only requires a table or a board where the participants can place the cards. It is also a good method to use if you want to find out how the participants group concepts as well as identifying concepts that are easily misunderstood (“Card sorting | Information & Design,” 2016).

The type of sorting that the participants will use is called a “closed” sort, which Brucker (2010) differentiates from the “open” sort in a way that instead of participants sorting the cards into categories that they name themselves, they have to fit each card in a predetermined category.

A semi-structured group interview includes a set of topics or questions that the interviewer formulates before the group interview, but still leaves room for further exploration and digression during the interview.

The goal of this method is to include teenagers in the game design process in a fun way and in a way that’s easy for them to understand. The cards will help participants generate game ideas, and in the same time teach them which game elements are common in games. The cards are meant so serve only as an inspiration to the participants and to help them think about what they like in games. That way, the teens can get inspired to combine elements they already like into a new game while at the same time allowing them to be creative.

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**Figure 4.2 First draft of GDC, on the left “Choose different roles” and on the right “Customize appearance”**

The design of the Game Design Cards went through three iterations. The first draft can be seen in Figure 4.2 where I used pictures from computer game *The Sims* (“The Sims,” 2016) to illustrate some of game elements that are common in games. After I got feedback from my
mentors and the KULU group, we decided that the cards should be neutral so that my co-designers would not associate them with existing games.

For the next iteration, I went back to basics and focused on finding out what kind of elements a game consists of. Therefore, I drew which images reminded me of games and drafted them on paper, see Figure 4.3.

![Figure 4.3 Second draft of GDC](image)

The cards that I ended up with for the second draft are: “hospital”, “castle”, “forest”, “village/city”, “quests/mission”, “fighting”, “map”, “boss/villains”, “levels”, “skills/capabilities”, “mentor” and “supernatural creatures”, see Figure 4.3.
After I showed the second draft of the cards to the members of the KULU group, there were some changes that were made to the cards. Cards: “hospital”, “castle”, “forest” and “village/city” were changed to less concrete settings, such as: “present time”, “middle ages” “future time” and “supernatural”. The reason for this is that the participants can come up with on their own how the world should look like, while the cards can inspire them instead of guide them through the design process. The cards “fighting” and “boss/villains” merged into one card, which got the name “boss/villain” and an explanation that implies that the style of the game is fighting monsters and villains in order to move forward in the game. The card “quests/mission” was kept as it is, with only a slight change of name to “quest/mission”, while the card “map” was replaced with the card “treasure hunt”. An additional card was suggested in order to provide the co-designers with greater liberty when designing. This became the card “mini games” with a description that explains it as a collection of small and short games. Cards “levels” and “skills/capabilities” were deemed as good enough in themselves, while “mentor” and “supernatural creatures” cards were removed. Instead, the cards from the first draft were brought back with a slight change of names of “different roles” and “customization of the character”.

In the final iteration of the cards, I found images that represent each concept in a neutral way on the Internet, and gave each card a description to make the concepts as clear as possible, see Figure 4.4. The final GDC consists of twelve cards that can be split into three categories where four cards belong to each category. The first category is about the type of world that the game should be set in, and the cards are: “present time”, “future”, “supernatural” and “middle ages”. The second category is type of game and includes the cards: “quest/mission”, “mini games”, “treasure hunt”, and “boss/villain”. The last category consists of game elements such as: “levels”, “skills/capabilities”, “different roles”, and “customization of the character”.

![Image](image_url)
The cards consist of three elements: on the top the name of the card, the image that represents the concept in the middle, and an explanation at the bottom of the card. I printed the cards and laminated them because it gives them a more finished look and feel, and is easier to clean and disinfect after the workshop in case they are to be reused on a later occasion. I also used sticker dots in different colors that I placed in the top right corner of the cards, as a way of marking different sets of cards, see Figure 4.5 for an example of the printed version of the cards. The reason I did this was to be able to see which participant placed which card where on the Needness Scale.

Figure 4.5 Printed version of "Present time" card
Culén and van der Velden (2015) suggest the use of images because of their potential to free the working memory and offload cognitive processes onto perceptual process. Where Culén and van der Velden (2015) used images as the primary source of the mapping of experiences in public transportations, Sommervold and van der Velden (2015) used images to illustrate keywords and concepts that were written on the cards instead, which is the same as I did in addition to adding a description on the cards to better explain the concepts.

4.1.3 Execution

Before the workshop took place, participants signed a collective consent form regarding the entire KULU project, see Appendix A, where they agreed to participate and consented to be audio recorded and taken pictures of. I recorded the session using a recording function on my phone, but I turned off the Wi-Fi and switched on the airplane mode until I came to the university and transferred the recording on a secure external hard drive that was safely locked in my cabinet.

The workshop was held at Ahus at two different rooms that overlooked each other, one large and one smaller room. Since 5 out of the planned 9 participants showed up to the workshop, the participants were split into two groups instead, where group 1 consisted of three participants and group 2 had two participants. Each participant was assigned a number as a way of making the participation anonymous. Group 2 was assigned to my station first, so even though they were my first group, I have kept the group numbers that were assigned to them in order to avoid confusion later on. In the large room, three of us had different sitting areas aka the Design Stations, which the groups visited in a rotational manner, while one person held his workshop in the smaller room. One other master student and I used the same room at the same time, which is why we separated our stations as far as possible from each other in order to not disturb each other’s workshops.

In the beginning of each of the two session, I presented my master project and explained that the goal of the workshop is to generate ideas for a transition game. To help participants generate ideas, they each were given a set of GDCs that they were supposed to place on the Needness Scale. Group 2 discussed each card first and then placed it on the same place on the scale, even though they each had own their set of cards. Group 1 on the other hand, placed the cards from each category on the scale first and then discussed their choices.
Ahus uses check-lists called “My Health” and “Ready for transition” (“Brosjyrer,” 2016) as helpful tools when a teenager is transitioning from BUK to adult hospital. I brought these check-lists to the workshop to use as an inspiration to how to include the transition element into the game.

Each participant had their own set of post-its which he or she could use to make a new card if there were some elements that were missing, but participants could also use them to draw their own ideas of how the game could be like.

My role in these sessions was to lead the discussions and make sure that every participant had a possibility to say something about each card, before we moved on to the next one.

4.1.4 Results

The workshop resulted in two different ideas for a transition game, that had some similarities. We can see how the groups sorted their cards on Figure 4.6.

![Figure 4.6: On the left is the sorting result from group 1 and on the right is the result from group 2.](image)

To better illustrate where the cards were placed, I created Table 4.1, which shows how many participants, out of 5 in total, have placed the cards where on the scale.
Table 4.1 Sorting results from both groups in workshop 1

<table>
<thead>
<tr>
<th>Cards</th>
<th>Need to have</th>
<th>Nice to have</th>
<th>Don’t need to have</th>
</tr>
</thead>
<tbody>
<tr>
<td>Present</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Supernatural</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Future</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Middle ages</td>
<td></td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Mini games</td>
<td></td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Quest/Mission</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treasure hunt</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boss/Villain</td>
<td>2</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Skills/Capabilities</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levels</td>
<td>2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Different roles</td>
<td>3</td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Customization of the character</td>
<td>4</td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

In general, group 1 was more interested into a futuristic and supernatural game, while group 2 wished for a realistic present time game. All participants agreed that the goal of the game should be to solve one major quest, which in this case is the transition itself. They also agreed that the game should be split up so that you play different levels according to which age group you belong to. Even though every participant from group 1 placed the card “boss/villain” under “don’t need to have” category on the scale, they agreed that the game should have a bad guy like a doctor for example that they could get rid of by using a magic skill. Also, the same participants placed the card “levels” under “nice to have” category, but discussed that the game should be split up into age groups and have different worlds for each of them which is almost identical with the concept of levels.

4.1.4.1 Idea from group 1

The game is set in a futuristic, supernatural world where the characters go on treasure hunts and quests, but the goal of the game is to be ready for transition when you finish the game.
The gamer can create the character to play with by choosing between different roles, skillsets and by customizing the appearance. The characters can have different skills and superpowers, and some of the suggested characters were a warrior and a witch.

The player answers the questions from the checklist during the quest and collects points by going on a treasure hunt. At different points in the game, the player will meet a boss which can be defeated by answering several questions from the check-list at the same time.

The way you level up in the game is by being able to cross things off the check-list. There should be three different worlds that are adjusted to different age groups.

One of the participants suggested that there could be hidden hints in the game, or perhaps that a side goal of the game could be that you have to solve a mystery.

4.1.4.2 Idea from group 2

The game is set at a hospital and the main goal is to get from BUK to adult hospital. The character goes on quest and treasure hunt, and gains coins for each thing that they can cross off the checklist. Mini-games can be an extra feature in the game, but the main feature is the journey from BUK to adult clinic.

Players can get extra coins and level up when they defeat one of the bosses in the game. Before each boss appears in the game, the player can select a set of more difficult questions from the check-lists that needs to be completed in order to defeat that boss.

The participants suggested that the game should be split up into levels where the player needs to answer certain questions about their transition before they can level up, starting from the easy to the more difficult questions. The final two levels will represent the adult hospital, and should be played after the player has been transferred to the adult clinic.

There should also be an Information button in the game that has the function of a dictionary and explains the terms used in the questions from the check-lists.

One of the participants used the post-it notes to illustrate the game, see Figure 4.7.
4.1.4.3 **Game elements**

Based on the workshop, the results can be divided into two categories. The first one is in regard to which game elements were most frequently chosen by the participants, while the second one is the new concepts that showed up in the discussions.

There are three elements that all of the participants actively chose as a “need to have” in the game are: “quest/mission”, “treasure hunt” and “skills/capabilities”. All of these elements were actively discussed and implemented in game ideas that both of the groups came up with. Settings “present time” was explored as an arena where the game can take place by group 2, while group 1 chose the “supernatural” setting for the place of their game story.

“Customization of the character” was deemed important by four of the participants because they offer the possibility to make the appearance of the avatars to their own likings.

“Boss/villain” was also discussed as an important aspect of a game, where one of the participants said the following: “I’m thinking that if the bad guy was the doctor and [he] was being difficult, then one of the characters could throw [their] medicine at the doctor so that he would get the side effects.”.
The game element “levels” doesn’t cover everything that the participants discussed, instead, it inspired participants to come up with more detailed game elements such as: magic, life and experience (XP) of the character. More precisely, how characters can gain more magic by answering the questions from the check-lists which they can then use against the villains in the game, how characters’ life can decrease if they get injured in the game and how when fighting the bosses in the game, the players need to answer several questions from the check-lists in order to get more points and an increase in XP.

Multiple participants mentioned concepts that weren’t a part of GDC. The most frequent one was “coins”, where participants meant that the characters should earn coins when defeating the villains in the game. There was also lots of mention of the concept “magical object”, where the characters could use magical objects to throw magic and the players will be rewarded with these objects. Another concept that came up was “knowledge” where one of the participants stated that “to move forward [in a quest] you need to have knowledge about your rights”, which a player should learn about when playing the game. One more concept that was frequently mentioned was “room”, where the participants discussed how the players can enter a room in order to explore it and see if there is any treasure there that they can collect.

4.1.4.4 Important aspects of the game

Based on the discussions with the two groups, there were some other results that are worth mentioning. One of them is connected to the concept of fun where several participants expressed that the game should be educational but that it is most important that it is fun to play. As one of the participants said: “if it [the game] is fun, any age group will play it”, which was completed by another participant with a statement that: “there must be some meaning behind so that the people have the benefit of the game”. There also shouldn’t be too much focus on the hospital things as many participants agreed that they would like to use the game to escape from their world and just have fun. It also came up that it will be fun if the game rewarded the player’s knowledge about transition.

Another issue that was discussed is how important it is for the players to always answer questions from the check-list honestly, otherwise they will always win in the game but loose in the real life as they will be less prepared for the transition. One of the participants strongly argued that the game should not check whether the player is honest or not, because this should be up to them and is a part of growing up.
The way the game can prepare the teenage patients for transition is by encouraging them to have control over their own health, through the completion of the check-lists, but also to prompt them to seek contact with the hospital if they are not in control of their health situation and need help.

4.1.5 Reflections

There was a big difference between the sessions I held with the two groups. The groups collectively wanted different elements in the game and they placed cards in a different manner on the scale. Even though they used different techniques, the participants within each group agreed on most of the cards when it came to where they should be placed on the scale, see Figure 4.6. Another difference is that there was a complete agreement on how the game should be like between the participants in group 2, while the group 1 had more discussions about how the different elements should be implemented into the game.

Even though the game ideas seem different, many of the game elements are the same. This is because both groups used the same cards during discussion, but they also chose many of the same cards as an inspiration for the game.

During the workshop, I didn’t participate in the placement of the cards, but I did come up with suggestions and start discussions around the cards, particularly with group 1. As I mentioned before, group 2 was assigned to my station before group 1, which is why I during the session with group 1, suggested ideas that group 2 had come up with to check if they agree with them but also to break the silence and get the discussion going again. Considering that I use PD methodology where the designer is a co-creator and not just a moderator, then participation of the designer is necessary to drive the discussion but also to explain technical possibilities.

Conversation was more fluent in group 2, but this could be due to the fact that there were only two participants where one of them was constantly coming up with ideas and suggestions that were than discussed. There were 3 participants in group 1, which made it more difficult for everyone to have a say. This led to one person being left out of discussion in the beginning which in turn enhanced my role as a moderator as I needed to include that person back into the discussion, which I did by asking that person questions directly.

The workshop itself went well, and 25 minutes was just enough time to go through all the cards and discuss more in depth the game itself and how we can implement the check-list. It
appeared that the participants were having fun, and they expressed that they were satisfied with the entire workshop as a whole and didn’t have any issues or concerns.

Only one of the participants came with a suggestion for a new card at the very end, which means that I could have encouraged them more during the session or brought more interesting drawing items instead of post-its and pens to inspire them to come up with new cards. It could also mean that they were satisfied with the cards and that they covered the most important and interesting game elements.

As I showed in the previous section, one of the participants used the post-it notes to draw the game idea that the group had discussed. The reason why the other group didn’t do the same thing could be because the post-its weren’t inspiring enough or simply because it wasn’t one of the predefined activities. In the beginning of the workshop, I said that the participants can use post-it notes to draw on them, but if I instead encouraged them more during the discussions to use them and draw what they were thinking, maybe more of the participants would have used them. But since only 1 out of 5 participants showed interest in drawing, the next workshop should offer some other design activity that doesn’t involve drawing.

The poster with The Needness Scale on it should have been bigger so that the participants could have had more room to place the cards, as well as separate the categories with vertical lines. What happened in the workshop was that the participants placed the cards underneath the poster, see Figure 4.6, which worked well but was more difficult to see whether some of the cards have been placed under “Need to have” or “Nice to have” category in retrospect. The only way I managed to decide where some of the cards have been placed was based on the audio recording that I listened to while transcribing.

4.2 The process in-between

4.2.1 Paper Prototyping

After the first workshop, I transcribed the audio recording and wrote down the ideas that the two groups had which I described in the previous section. Based on those two ideas, I produced 2 different paper prototypes that represented the game concepts. The method I used to visualize the ideas is called Paper Prototyping. Houde and Hill (1997) describe prototypes as: “the means for examining design problems and evaluating solutions” (1997, p. 368).
Houde and Hill (1997) propose considering the prototypes’ purpose by looking at where it fits between *implementation* – which usually requires a working system to be made, *look and feel* – which requires user experiences to be simulated or created, and *role* – which requires the establishment of the context in which the artifact will be used.

Both prototypes that I produced can be placed within *role* and *look and feel*, as shown by the red dot in Figure 4.8. Because the prototypes are in the form of sketches, it makes them more suited towards *role*, but the look of them, despite the lack of interaction, places them towards the *look and feel*.

### 4.2.2 Prototype 1

Idea from group 1 was based on GDCs: “supernatural setting”, “quest/mission”, “skills/capabilities”, “levels”, “boss/villain”, “different roles” and “customization of the characters”, and resulted in prototype 1 that can be seen in Figure 4.9 together with the cards. Even though the card sorting results for group 1 differ from the chosen cards for this prototype, the prototype still represents the game idea that came up during the discussion of the cards. The group suggested a mixture of a supernatural and future time setting, but eventually focused only on the supernatural game elements. As for the “boss/villain” card that they initially didn’t want in the game, they admitted later in the discussion that it would be fun to have a mean doctor who plays the role of a boss in the game that they could cast magic spells on in order to defeat. When I illustrated bosses and enemies in the game, I went from small creatures represented by a bat, to bigger creatures such as a smaller and a bigger evil
werewolf. I intentionally left out hospital elements from prototype 1, because prototype 2 is set in a hospital setting and I wanted to illustrate the differences between the two ideas.

![Prototype 1 with represented GDC](image)

The sequence of prototype 1 goes from left to the right, and goes as follows: the player enters age, then chooses the gender of the character they want to play with, after that the type of character such as fairy, elf, wizard, sorcerer, dwarf, man, vampire or werewolf, and then customizes the characters’ face, hairstyle, body and/or outfit if desired. After those choices have been made, their age will decide what kind of world the game is set in, world 1 for ages 15-16, world 2 for 17-18 and world 3 for those that are 19 or older. Examples of the three world is illustrated in the bottom squares in prototype 1. The main difference between the worlds is that the questions from the check-lists are split up into easy, medium and difficult questions and assigned to the different worlds. As the player gets older, he/she will meet bigger and bigger enemies, get new skills and gain more points which will lead them to level up. The final levels are set after the player turns 18 and has transitioned to the adult hospital. For a bigger picture of prototype 1, see Appendix F.

### 4.2.3 Prototype 2

Prototype 2 was based on the idea from group 2, and was inspired by cards: “present time”, “quest/mission”, “treasure hunt”, “skills/capabilities”, “levels”, “boss/villain” and “customization of the characters”, and can be seen in Figure 4.10 together with the cards.
The sequence in this prototype also goes from left to right, and the game starts by the player entering the age, choosing the gender of the character and if desired, customizing the character. In this prototype, the age will decide which levels the player will get to play. As the player gets older, more levels will unlock and the questions from the check-lists will get more and more difficult. The prototype shows three different views of the map. In each view, the character travels from BUK to adult clinic and the setting is set in a hospital. In view 1, the different floors in the hospital represent different levels. View 2 consists of many rooms on the same floor where the characters meet bosses along the main hallway. While view 3 shows a hospital area that consists of several modern buildings that the character gets to explore on the journey from the building representing BUK to the building that represents the adult clinic. The final route in the prototype exemplifies the use of the check-lists where the player earns more coins when he/she can answer with a “yes” on the questions from the check-lists. These coins are an addition to the rewards that the player earns when discovering a treasure chest or defeating a boss. For a larger version of prototype 2, see Appendix G.

4.3 Workshop 2

During the first workshop, fun as a concept was reinforced as being very important when it comes to games. The participants claimed that fun is very important as a motivation to play
games, especially when there is a serious background to the games or a learning element. Since the participants from the first workshop sorted the cards accordingly to what a game needs to have rather than what is fun in games, the focus of the second workshop was on fun as well as how to implement the check-lists into the game in a fun way.

I prepared for this workshop in several iterations. As with the first workshop, I met with my mentors and other members from the KULU group to get feedback on my method along the way and make improvements. The first iteration was described in the previous section, as explained I went through the data from workshop 1 and created the two prototypes. These prototypes were based on some of the GDCs, but they were made as a way of representing the ideas that came up during workshop 1 as precisely as possible. Based on the two prototypes, new concepts emerged that led to creation of new cards.

The goal of workshop 2 was to work further with the concepts that emerged in workshop 1, rather than to have the same type of workshop again. This way, workshop 2 was the next step in the design phase where the intention was to make a more evolved design proposition.

4.3.1 Game Design Workshop (GDW)

I revised the GDCs from my first workshop that was held at Ahus based on the results from the workshop and also in a way that the prototypes that I made could be developed further. While redesigning the method, I also took into consideration the fact that participants from workshop 1 showed little interest in drawing.

Cards that were chosen and actively included in the discussion during the workshop were kept, and new topics that emerged during the discussion, such as “Knowledge”, “Magical item”, “Room” and “Coins”, were made into new cards, see Figure 4.11.

![Figure 4.11 GDW cards representing the new concepts from the left: knowledge, coins, magical item and room.](image-url)
After a discussion with my mentors, it was decided that a new concept called “portal”, Figure 4.12, should be included in the new card set. The function of the “portal” is to enable the participants in workshop 2 to combine the two prototypes, that are a result of the discussions from workshop 1, if they find it interesting and fun.

Figure 4.12 GDW card representing the concept of a portal.

Instead of using the check-lists as an inspiration in the same way as in workshop 1, I designed cards that represent the questions from the check-lists, see Figure 4.13. Instead of using the actual questions from the check-lists, I made questions from the Ahus brochures “Legally Young” and “My General Practitioner” (“Brosjyrer,” 2016) because they are more relatable for teens that don’t have long term health challenges as they concern health issues that everyone should know in case they get the common cold for example or any other range of diseases.

Figure 4.13 GDW cards representing the questions in the game, from left to the right: easy, medium and difficult question.

All three categories from GDCs were kept, but only the cards that were represented in prototypes 1 and 2, got chosen for the next workshop. From the category “type of world”, cards “present time” and “supernatural” each represent their own prototype and were crucial as to find out what the teens preferred.
Three out of four cards from the category “type of game” were represented in the game, and those are: “quest/mission”, “treasure hunt” and “boss/villain”, see Figure 4.15.

The third category was “game elements”, and all of the cards from that category were selected by at least one of the groups in workshop 1, and are as follows: “levels”, “skills/capabilities”, “different roles” and “customization of the characters”. Out of those cards, “skills/capabilities”, “customization of the characters” and “different roles” were kept for workshop 2, see Figure 4.16, while the card “levels” gave origin to the cards: “life/HP”, “experience/XP” and “magic status”, see Figure 4.17.
The format of the cards was kept, but I made them smaller and didn’t put color dots on them because they were to be used in a different way in the second workshop, see Figure 4.18. The new cards that didn’t represent the same concepts as GDCs, got their name and description from how they were discussed during workshop 1, while I found a suitable image to represent them that would be easy to recognize even without explanation. Where the participants sorted the cards in the first workshop and used as inspiration for the discussion, in the second workshop, the cards were placed on a map instead. These revised cards were more focused on the design of transition games, while the original cards were general and can be used when designing any kind of games.

Figure 4.18 On the left is a card from workshop 1 and on the right is the smaller version used in workshop 2

This new method, which I have called Game Design Workshop, is similar to the GDC method as it also combines elements of a semi-structured group interview with inspirational cards, but lacks the card sorting element. Instead it consists of a warm-up activity where the participants are supposed to fill out two revised checklists based on “My Health” and “Ready for transition”. This is followed by a discussion inspired by the revised GDCs and a design activity. For the design activity, I have prepared three different maps: an empty one which consisted of a blank paper, a modern one, see Figure 4.19, which was inspired by the modern
buildings in portrayed on the “present time” card as requested by group 2 in workshop 1 and a magic one, see Figure 4.20, that represents the “supernatural” setting proposed by group 1 in workshop 1. The blank piece of paper, which I will refer to as the empty map, was included to give the participants an option to create a mixture of the modern and the magic map or to create a completely new game world.

Figure 4.19 Game map representing a modern world

Figure 4.20 Game map representing a magical world
To be able to further evolve the design of the game, I made paper cut outs of different elements in the game such as different types of characters, trees, houses etc. two revised checklists based on “My Health” and “Ready for transition” as well as the original ones and pamphlets called “Legally Young” and “My General Practitioner” all provided by Ahus (“Brosjyrer,” 2016). The reason why I revised the check-lists is because the participants in the second workshops were young adults without health challenges, so I chose only a selection of questions that could be relevant for them as well to know about their health in general.

4.3.2 Execution

The workshop was conducted at the participants’ home and it lasted for one hour. There was a total of two participants, one boy age 17 and one girl age 21. I had an assistant with me that helped me with practical issues, such as taking pictures during the workshop and organizing all the cutouts that I brought to the workshop.

Before the workshop started, I had the participants read through a consent form, see Appendix B, where they agreed to participate and consented for the workshop to be audio recorded and have their pictures taken during the activities.

In the beginning of the workshop, I presented my master project and told them that I have held one workshop with the Youth Council at Ahus. Then I went on explaining what is transition and telling them what it’s like to be a teenager with a chronic health challenge. To be able to imagine their situation better, and understand current practices around transition, the participants were briefly shown the original check-lists and then given revised check-lists to fill them out. After they filled them out, we discussed how they perceived filling out the check-lists.

In the second part of the workshop, I showed the prototypes that I made based on the ideas from workshop 1 and explained that I need their help to evolve those designs further because they are experts on being young adults. I stressed that the focus in this workshop is on designing a fun game that deals with transition, that builds further on findings from workshop 1.

As a way of structuring the discussion, I asked a series of questions while the cards were laid down on the table so that they were visible for both participants. If, during the discussion, a concept that was on the card came up, we discussed the card and left it in the table if it was
interesting to keep, if not, we placed it away. In the end of this phase, we discussed the cards that weren’t brought up during the discussion, except for the question cards, and summarized the new game idea so that everyone was in agreement.

In the next part of the workshop, the participants chose a map that they wanted to work with and then we used the cutouts to filled out the map. Together, we decided how the heroes journey will look like and how to implement the questions from the question cards in a fun way into the game.

At the end of the workshop, I asked the participants to fill out a short survey, see Appendix C, as a way of evaluating the workshop.

4.3.3 Results

4.3.3.1 Check-lists

Both of the participants filled out the revised version of the “My Health” check-list, see Figure 4.21, while only one of them managed to fill out completely the “Ready for transition” check-list, see Figure 4.22. Which questions I chose to keep in the revised versions of the check-list and how the participants answered the questions, is not what’s important here.

What is important is that the participants got an opportunity to see how it’s like to have to fill out those check-lists, which in itself served as a warm-up exercise for the next part of the workshop.

After the participants answered the check-lists, one of them expressed the following about the check-lists: “They do not provide as much information. You are just thrown into it. I do not think I would have felt safe if I only had this as the transition.”, a statement which the other participant strongly agreed with.

This can indicate that check-lists on their own do not provide enough information to the teenage patients, especially since a button on more information was already suggested in the first workshop by the members from the Youth Council that have a better starting point than these teens did.
Figure 4.21: Filled out versions of the "My health" check-list

Figure 4.22: Filled out versions of the "Ready for transition" check-list
4.3.3.2  
**Journey from the start to the finish**

Out of the three map options that participants could choose from, an empty map, a modern map and a magical map, the participants chose to use the magical map, see Figure 4.23, that they could build upon, instead of starting from scratch on an empty map. Their reasoning was that it was easier for them to place cutouts representing different items, such as houses, on a map that was almost done already, instead of start completely from scratch on the empty map.

One of the things we discussed in the workshop was how the character’s journey in the game should look like. Figure 4.23 shows the chosen map with the steps on the journey numbered from 1 to 5.

Step 1 is the starting point in the game which the participants decided should be in a village with simple houses that they added to existing house on the map to create the village, see point 1 in Figure 4.24. At the beginning of the game, the player should have an opportunity to go on small quests and earn some coins in order to learn how the game works, which the participants symbolized with a cutout representing a coin, see point 2 in Figure 4.24, and a cutout representing how much life, experience and magic the player has, see point 3 in Figure 4.24.
Step 2 in the game would be to allow the player to explore the nearby towns, see point 2 in Figure 4.23, and go on bigger quests. This part of the game should be for all players, but particularly for those under 18 years. On these quests, the players will encounter evil minions, see point 1 in Figure 4.25, that they have to fight in order to earn points and coins.

Step 3 shows the enchanted forest, see point 3 in Figure 4.23, that is going to be filled with magical creatures such as elves and fairies, as well as forest animals like wolves, see point 2 in Figure 4.25.

Step 4 of the journey is the desert, see point 4 in Figure 4.23, where the players will encounter bigger enemies or so called bosses, see point 3 Figure 4.25. Steps 3 and 4 are intended for players that are around 18 years old and getting ready for transition.

Final part of the game will take place at an evil volcano, see point 5 in Figure 4.23, where the player will in the end of the game encounter the final boss, see point 4 in Figure 4.25. This part of the game is intended for players who have gone through transition and are over 18 years old.
At each step of the game, the player can choose to go on different quests. During each quest, the player has to answer the questions from the check-lists. By answering the questions correctly, players’ XP increases. The questions can also help the player get resurrected in the game if the player can answer correctly. This is why it is important that the format of the questions allows the players to choose an option out of 3 or 4 possible choices, instead of the ‘yes or no’ format that the questions from the check-lists currently have.

4.3.3.3 Survey

Results from the survey show that the participants were very satisfied, both gave a 5 out of 5, with several of the aspects from the workshop, such as the setup of the workshop, that they felt that their opinions were acknowledged and that they thought that the activities were understandable. As for how fun the activities were, one participant gave 4 out of 5 while the other gave a 5 out of 5, while on the question of how satisfied they are with their own contribution to the project, one participant gave a 5 out of 5, while the other gave a 3 out of 5. When it comes to whether they experienced something that wasn’t good or uncomfortable and whether something could have been done differently, none of the participants answered.

4.3.4 Reflections

In the beginning of the workshop, the participants had some trouble filling out the shortened check-lists, particularly the “Ready for transition” check-list. Even though I removed many
questions and left those that can be relevant for teens without health challenges, they still couldn’t understand what was meant and experienced the check-lists as abstract. This activity left them confused which is not an optimal starting point for a design workshop, but the teens did get an opportunity to feel what it is like for teens who do have health challenges when they first encounter the check-lists. That in itself was good because the game is for teens with health challenges, so the participants got to put themselves in their situation and think what would they want if they had a health challenge themselves while designing the game.

When we discussed the cards, the participants expressed that they preferred the supernatural setting in an open world which made the “Room” card unnecessary.

Since the participants didn’t sort the cards in this workshop, the cards played a different role in the discussion than in the first workshop. They served more as a reminder for me to ask what game elements they think are fun, and where on the map could certain things such as “Boss/Villain” and “Coins” be, but the participants didn’t place the cards on the map as originally planned. This could also be because there were different types of cards. Some cards weren’t meant to be placed on the map, such as “Present time” and “Supernatural”, while others such as “Magical objects” and the cards with “Easy”, “Medium” and “Difficult” questions on them, could have been placed on the map. Another reason for the participants not placing the cards on the map, is because there were cutouts as well as the cards, that were smaller and could have been placed on the map without overshadowing it. As it was, the map that the participants chose to use as a starting point for the game world was too small to place cards there or to permanently attach the cutouts to the it. Instead the participants just temporarily placed the cards around the map and the cutouts on the map, which is why all the maps that I brought to the workshop should have been bigger.

The cards representing the questions in the game needed concrete answers as opposed to the yes-no questions from the check-lists, which is most likely the reason why the participants recommended use of multiple choice answers in the game as a way of implementing transition. Because of the nature of the check-lists, this would be difficult to implement directly in the game, but if the questions got rephrased in a way that offers several answer alternatives, then it would be a plausible element in the game. Even the members of the Youth Council that participated in the first workshop talked about the check-lists as questions and wished for a dictionary to help explain them, so it could be a good idea to completely redo the check-lists in a way that’s easier for the teens to understand, but also as a way to test their
knowledge where possible since not all items from the check-list can become something other than yes-no questions. What I forgot to ask about in this workshop was if they wished for a dictionary in the game since it was mentioned in the first workshop as an interesting feature. But since they had trouble understanding the check-lists, this indicates that some sort of help in the game is needed to better understand the questions from the check-lists.

When it comes to the survey, the participants only answered on the questions where you had to circle around an option, which led to the last two questions, that only had a free text option, not being answered. This might be due to the fact that each question had a free text option as well, which could have led them to think that the final two questions were optional to answer. It also appeared that they weren’t that interested into writing in the first place and preferred questions that you can grade by circling around the answers like the first five questions, see Appendix C.

In hindsight, I should have asked through the questioner as well whether they think that the game we designed is more fun than the check-lists and also whether they learned something both about the transition and also about game design. The reason for this is because the answers I got when I asked this orally was answered with a nod or a “yeah, sure”, which didn’t provide me with much data. I also shouldn’t have limited discussion to the game being single player only. We did discuss if they could choose, what kind of characters would they go on a quest with, but I didn’t get an answer on whether they consider a multiplayer game to be more fun or not without influencing their choice. The reason why I chose to exclude the multiplayer option is because a transition is very personal and it would be difficult for several players to play together since they all need to cross things off the check-lists for their own sake which than limits the progress of the game. On the other hand, it could be a good motivational factor if one player crossed off an item and needs to motivate the others to do it so they could move on, or it could be a competition against each other where they can compete to see who checks items off faster for example.

Since the participants in this workshop consisted of regular teens, I assumed that it will be more difficult to engage them then the teens with health challenges because they will see no direct use for themselves. This is not an unusual problem in PD as both Nicholas et al. (2012) and later on Verne and Braaten (2014) discuss how to engage the uninterested or unengaged participants. Their research appeared to be useful for my second workshop as I realized that by teaching the regular teens about transition and engaging them into their own health rights,
they will be better prepared to participate in the design workshop, similar to the way that Verne and Braaten (2014) engaged their participants with the topic of taxes. This is the reason why I brought the different brochures and the check-lists and used them in the beginning of the workshop.

Nicholas et al. (2012) found out that their participants valued use of games to create a fun atmosphere, meeting new people and working together, working towards a positive outcome, talking about an interesting and complex issue and learning more about mental health issues and their solutions. This is something that I aimed towards in my design workshop as the topic is games, and through a playful design activity that is accomplished by working together towards a positive outcome that is a new prototype, they will have the opportunity to talk about a complex issue which is transition and learn more about it and their own health rights in the process.

A question arises whether or not it is the participants that are unengaged or is it the designers that fail at making the design activities fun for their participants. In order to be able to evaluate whether or not the participants considered the workshop to be fun or not, I have designed a survey, that can be seen in Appendix C, and observed their body language during the activities to see what activities need improvement.

4.4 Reflections on the methods

4.4.1 Advantages and disadvantages

Some of the advantages with these methods are that they are cheap to make, demand a small amount of time for the researcher to make tools and organize them, can be easily adjusted to different types of game design by changing the type of cards or the maps used, are appropriate for when designing with teenagers because they are understandable and as the results show, good to use in the beginning of the design phase as they can help the teens generate ideas.

If we take a look at some of the disadvantages of these methods, it’s that they are specifically designed for game design with teenagers, meaning that if the goal is to design for something else than a game or have a different target group, they are not appropriate to use. They also depend on the participants’ creativity and imagination, that they have previous experience in
playing games, and that they are being engaged in the activities in order to come up with, or further develop, a game idea.

4.4.2 Participation

One of the questions that are crucial to ask when doing a PD project, is whether real participation has been accomplished. What we mean by that is whether the right type of participation has been employed during the project, that of a co-designer rather than a tester, and whether the representatives from the target group are involved enough in the game design process.

In this master project, the intent was to involve the representatives from the target group, in this case the Youth Council, at every step of the design process. The original plan of the research was to have two workshops that are approximately three months apart where both of them were supposed to be held together with the Youth Council at Ahus. Due to health issues, the original plan had to be changed and this resulted in only one workshop with the Youth Council. One of the measures that I took in order to make up for the missed workshop with the Youth Council, was to involve participants that fit the age group but that don’t have any health challenges. They served as proxy users and were involved in workshop 2 as a way of building further on the ideas from the potential users, in this case the Youth Council.

Even though I worked on organizing other workshops, I was forced to cancel them due to the same health issues. This resulted in a prolonged time that was required to organize and manage the workshops, and also to finish the master project. Though on one side, it was a negative aspect that I had no control over which strongly influenced the design process, on the other side, it reinforced my already existent motivation to research on this very important issue in the health care system, which is the possibility to make the transition more fun for the teens.

4.4.3 SHARM

Since the chosen approach for this research was the SHARM framework, it is important to reflect upon whether the design activities fulfil the requirements that SHARM stands for. In order to do that, I will go through each principle and discuss how it has been implemented in the project.
4.4.3.1 **S – Situated-based Action**

The principle of situated-based actions demands that the design activities are based in participants’ everyday lives and their experiences, which is why both of the workshops were executed face-to-face and in the settings that were natural to the participants. Workshop 1 was held at a hospital where the Youth Council usually meets both as a means of interrupting their lives as least as possible, as well as appealing to their patient self. This way, they were reminded that even though the game that we were designing is supposed to be fun, it also has to help teens that are in the same position as themselves. Workshop 2 was organized at the participant’s own home as a way of making them feel comfortable, but also as a way of designing in a setting where they would usually play games.

4.4.3.2 **H – Having a say**

Having a say means that the participants have actual possibilities to make decisions during the design process. This is why it was important that all of the participants had a say in the workshops, and that their opinions were acknowledged and brought further. The way I did this in the first workshop was by letting them see the results of the workshop, which were the sorted cards, as well as explaining to them that I will make prototypes based on their ideas. In the second workshop the participants could see that their choices affected how the story changed and they were able to choose the game idea they liked better and then improve it based on their own likings.

4.4.3.3 **A – Adaptability**

This principle was particularly important in regard to workshop 1, which was executed with the Youth Council at Ahus, because it points to the fact that the design situations can quickly change due to the teens’ capabilities and conditions. Even though the plan was to have three groups consisting of three participants each, I was prepared for the possibility that not all of them would show up, which would lead to either smaller or fewer groups, in this case both as one group had two participants while the other kept its’ original number or participants. Another issue was that the design method needed to be adjusted to different capabilities that the teens have, for example that one of them was in a wheelchair so the sorting of the cards needed to be done on a table so that it was easy to reach.
4.4.3.4  R – Respect

Respect is necessary when working with this particular target group as they are seldom included in the design process. Van der Velden et al. (2016) highlighted that teenage patients want to be treated as experts of their own life and be acknowledged that they are capable of acting in their own interest. That’s why I made sure that I thanked each and every one of my participants for their involvement in the process, and highlighted that I appreciate their contribution as they are the experts on being teenagers. The workshops were also designed as short and effective as possible out of respect for their time, particularly the workshop at Ahus which was implemented in collaboration with teens with health challenges.

4.4.3.5  M – Mutual learning

For the participants to feel like they have gained something by participating in the design sessions, it was crucial to enable mutual learning. That means that the participants need to learn from the researchers as much or more than the researchers should learn from the participants. During both of the workshops, I explained to the participants how to design a game, and they both resulted in results that the participants could perceive, sorted cards and a filled out game world map. As for me, I learned about what the teenagers consider to be fun in games and got their opinions on how they would implement check-lists in a game in a fun way.
5 Analysis

The workshops resulted in design ideas and prototypes, as discussed in the previous section, but also generated data in the form of audio recordings of the two workshops. In this chapter I present the Thematic Analysis of the transcribed audio recordings. The reason why I chose to separate the recordings from the prototypes is because the analysis will provide both context and deeper understanding of the choices that the participants made in the workshop. Based on the themes that came out of the Thematic Analysis, I have picked out a selection of cards from Schell’s (2008) *A Deck of Lenses* that I have further used to analyze the themes.

5.1 Thematic analysis

During my analysis, I engaged into the first five phases of the Thematic Analysis that I described in the chapter 3.3.3. I started the analysis by transcribing the audio recordings from both workshops and in that way really got to know the data I collected. Further, I coded the data before I searched for the themes. Initially, I noted down all possible themes that were reoccurring in the data before I searched for the connections between themes and collated the ones representing the same issues. The initial thematic map with initial themes and their connections can be seen in Figure 5.1.

After that, I set up a hierarchy of main and sub themes before I defined all main themes and found suitable names for them in English as the data I collected was in Norwegian. This resulted in a more developed thematic map that can be seen in Figure 5.2, where the round text boxes are main themes, while the squared text boxes are sub-themes.
5.1.1 Themes

There are 5 main themes, see Figure 5.2, that I identified through the thematic analysis of the collected data, which consist of: type of world, goal of the game, characters, check-lists and motivation. As Braun and Clarke (2006) point out, a theme represents a meaning about the data in relation to the research question. Since my research question is about whether a game can prepare teens for transition, and particularly about how to implement check-lists in a fun way, what game elements will motivate the teens to play the game and what methods are appropriate to use when designing with and for teens, it was important for me to find out what the teens consider to be fun in games as well as discovering how to implement the transition element into a game in a way that the game is still fun.
5.1.1.1 Type of world

The question about what type of world the game should be set in, is what jump started the discussion in both workshops. There was some disagreement in what type of world would be most suitable for the transition game, but the majority of participants agreed that a supernatural setting is more fun than a present time setting. Particularly one of the participants expressed that: “supernatural is fun” when asked about the preferred game settings. One participant even said: “we like fantasy and sci-fi” where another participant filled in with: “they are actually a really good match”, but the further discussion went in the direction of pure supernatural setting. One thing that all participants from workshop 1 agreed upon is that the middle ages setting would not be appropriate for a transition game, and is therefore something I didn’t even bring up in workshop 2. Since workshop 2 served as a way to further explore the ideas that were suggested in workshop 1, after deciding that supernatural setting is more fun than a present time world with the hospital setting, there was a discussion of how the game world should look like. An open world was preferred over a building or a city with many rooms as well as existence of portals throughout this world.
5.1.1.2 **Goal of the game**

As for what type of game it should be, there was an agreement in workshop 1 that it should be a quest or a treasure hunt, potentially with mini-games on the side. Further, each group from workshop 1 formulated their own goals for the game. Where group 1 wanted to use supernatural characters to defeat mean doctors, group 2 wished for a game that represent the reality, meaning that a character travels from BUK to adult hospital and fights bad guys along the way through knowledge about transition. Participants in workshop 2 expressed that smaller quests that include treasure hunts sound most exciting and suggested that the character starts in a small city or a village, and then move on to bigger and bigger cities and different surroundings all the way to a volcano where they have to defeat the final boss.

5.1.1.3 **Characters**

Most of the participants agreed that it is fun to be able to change the appearance of their character, also called an avatar, in the game. 5 out of 7 also wished for different types of characters in the game, and one person said that: “a healer and [those type of] specialized characters are fun”.

When it comes to the mean characters in the game or better said the enemies, everyone agreed that the game should offer some sort of reward for fighting them. There was also an expectation that the bigger the bad guys get, the further along in the game is the character.

5.1.1.4 **Check-lists**

The questions from the Ahus check-lists offer, according to participants, little information about the transition itself and can be confusing to understand. Therefore, if the questions from the check-lists are to be used in the game, they wished for a “More information” or a “Dictionary” option. One of the participants also saw the game as a way of involving health personnel to make sure that they do their part as well during the transition.

Being able to complete these questions without lying about it was connected to being independent and ready to take over being responsible for their own health. Teens from workshop 2 didn’t see it that way, as they have never been in that situation themselves, and rather suggested to create new questions in the game that offered several answers that you have to choose from.
All participants agreed that the level of difficulty of the questions should be connected to the levels in the game as well as the difficulty of quests on each level. It also came up that the initial levels should be for younger players, while the higher levels should be for older ones. There should also be a correlation between what type of question are on which levels. As it is, questions about sex and alcohol should be placed in higher levels where the players are expected to be older. Implementing the questions from the check-list into the game is a way of making the game a transition game. In order to make it fun for players to actually do things from the check-list, the game should offer some rewards.

5.1.1.5 Motivation

Motivation showed to be very important when it comes to transition games, and where teens with health challenges saw the game as an opportunity to distract themselves from their current situation as well as a way of having fun, the healthy teens primarily focused on the fun aspect. They all agreed that if there is to be a learning element in the game, that it will be fun if the gamers get a reward each time they learn something new. Type of rewards that were discussed as being fun are: skills, coins, points, and some general benefits for the player that could be used in the game.

Fun was a very important motivational factor for the teenagers, and one of them expressed that: “the game is fun when you’re learning without realizing it”. It was also brought up that the game should enable learning and fun, but without too much hospital related elements.

5.1.2 Critical reflections

When performing a thematic analysis, it is important to recognize that the data are not talking for themselves, but that it is the researchers that interpret the data and find deeper meaning (Braun and Clarke, 2006). With that being said, if someone else had interpreted the same data, they could have found other themes as being more prominent. As it is, my focus when analyzing the data has been on finding extracts that will help me answer my research question, meaning: what do the teenagers find to be fun in games, how to implement the check-lists in a fun way and what does the game need to have in order to motivate the teens to play it?
It is unreasonable and inefficient to present everything that has been said in the workshops, especially things that were repeated in the different groups. Therefore, I have collated the same opinions where several participants said the same, and marked that topic as important.

The process of analysis could have been done in a different way as different researchers consider different phases to be important in a thematic analysis. I could have also analyzed the data from workshop 1 and 2 separately instead. In that way, a clear distinction between what the teens with health challenges and those without consider to be fun in games. But since in workshop 2 we worked further with ideas from workshop 1, I considered it to be more orderly to analyze them together. In the end, I could have used a different analytical approach than thematic analysis, but I decided instead to use it as a starting point for the next part of the analysis.

5.2 A Deck of Lenses

In Schell’s (2008) description of how to use the lenses, he describes methods such as: divination; taking random cards from the set and then using them etc. Not all lenses may be as necessary, or possible, to use in my master project, but the ones that I will use, I will choose by correlating them to the themes and sub-themes discovered through the thematic analysis. The chosen lenses will be used to further analyze the collected data, and improve the current game designs.

The main method for choosing the cards was to seek for the names of the themes and sub-themes in the names of the cards. Even though names of some cards were a perfect match with some of the sub-themes, such as The Lens of Skill with Skills, they didn’t represent the same thing. While others, such as The Lens of Curiosity, didn’t seem to be an obvious match with the themes, but was a good match after all because the card focuses on player’s motivation for playing the game. This is why I also thoroughly read the description of each card to make sure that the cards match the same aspect of the game that was represented by the theme.
Based on the themes and sub-themes from the previous part of the analysis, I selected 9 cards that I will use to analyze the collected data and the game ideas that emerged during both workshops. Many other lenses could have been chosen, and someone else might have chosen some other lenses, but as it is, lenses that I will use to further analyze the collected data are: The Lens of Essential Experience, The Lens of Fun, The Lens of Curiosity, The Lens of Endogenous Value, The Lens of Goals, The Lens of Reward, The Lens of World, The Lens of The Avatar and The Lens of Character Function, see Appendix H for an overview of the selected cards. There were also some themes that didn’t have lenses that could be used to analyze them, and for those cases, I made my own lenses as an addition, and those are: The Lens of Transition and The Lens of Knowledge. The chosen and the new lenses will together serve as a tool for a deeper analysis of the collected data, and in that way help me design the next iteration of the game.

5.2.1 The Lens of Essential Experience

To be able to use this lens, Schell (2008) requires from the designer to stop thinking about the game and start thinking about the player’s experience, see Figure 5.3. This lens is interrelated with the theme “motivation”, because good experiences will motivate the players to keep playing the games. To be able to use this lens, Schell (2008) recommends asking questions
such as: “What experience do I want the player to have?”, “What is essential to the experience?” and “How can my game capture that essence?”.

As I discovered during the workshops, the teens want to experience fun as well as learn about the transition while playing the game. To be able to accomplish this, it is necessary to establish what the teenagers consider to be fun in games as well as finding a way to implement the transition into the game in a fun way in order to satisfy the learning aspect.

During both of the workshops, teens expressed following things about learning through fun in games:

- A person that goes through different levels is fun.
- Supernatural setting is more fun than present.
- To go on quests and treasure hunts is fun.
- It’s really fun to be able to throw magic at the enemies, especially mean doctors.
- Healers and specialized magical characters are fun.
- Gaining XP is fun.
- Small quests that include treasure hunts are fun.
- It is important to have rewards, and it’s especially fun to have coins as a reward.
- A game is fun if you learn through play without even realizing it.
- It is fun if the game rewards knowledge (about transition).
- The game should be useful and fun at the same time, without too much hospital stuff.

These things are essential to the experiences learning and fun, and particularly learning through fun. Most of these are very concrete game elements that can be captured into the game as is, such as a magical character in a supernatural world that goes on quests that involves treasure hunts, gets rewards such as coins and increase in XP when he/she learns something new about transition. Others, such as learning without realizing it and fun and useful at the same time, need further exploring. To be able to do that systematically, there is a need for a new lens that explores the learning aspect, which will be discussed later with the help of The Lens of Knowledge.

### 5.2.2 The Lens of Fun

“Games are fun” as several participants accentuated. Fun is very important when it comes to games as a motivation for playing them. As one of the participants expressed it: “It [the game]
should be fun and it should get you thinking about something else [other than the health challenge].

The Lens of Fun, see Figure 5.3, corresponds to the sub-theme “fun” which I placed under the theme motivation. Schell (2008) prompts the designer to ask questions such as: “What parts of my game are fun?” and “What parts need to be more fun?”. As I discovered through the use of The Lens of Essential Experience, parts of the game ideas that showed up through the workshops that are fun are: supernatural setting with magic and magical characters, quests and treasure hunts, levels and XP, rewards and learning through fun. These are all elements that should be an essential part of the game in the next iteration.

When it comes to what parts need to be more fun, it is difficult to decide because the teens were asked to discuss what they consider to be fun, and not to sort different elements of an existing game into fun or not fun. In the second workshops, the participants did get an opportunity to evaluate the findings from the first workshop, and one of the things that they considered to be not as fun was the implementation of the check-lists into the game. Both ideas from the first workshop suggested that bosses in the game should ask the players the questions from the check-lists in order for them to get more points or be allowed to the next level. Participants from the second workshop expressed that it will be more fun if the player had to answer the questions during a quest and in that way are connected to the players XP, and if the questions could help the player get resurrected in the game. This leads to three different ways that the check-lists can be incorporated into the game: during quests, in the end of quests when the players meet a boss and if a player dies.

5.2.3 The Lens of Curiosity

Schell (2008) explains that in order to use this lens, the designer needs to think about the players true motivations to play the game beyond the goals of the game. Since it’s the player’s motivation we are after when using this lens, it falls under the theme “motivation”. A way to explore the player’s true motivations, is by asking questions such as: “What questions does my game put into the player’s mind?”, “What am I doing to make them care about these questions?” and “What can I do to make them invent even more questions?” (Schell, 2008).

The true motivation for playing a transition game is to learn about transition in a more fun way rather than just filling out the existing check-lists. During the game, the players should be asking themselves what skills, which equipment and how high XP they need in order to defeat
the different bosses. They should be motivated to explore the different parts of the world in order to find all possible rewards. For the players to be inspired to explore the world, fight enemies and do things in the real world that will lead to them checking off the check-lists, the story needs to be encapsulating and the rewards need to match the effort the player puts in the game.

5.2.4 The Lens of Endogenous Value

Endogenous is a term that comes from biology and means “internally generated”. In game design, endogenous value is created within a game. The more compelling a game is, the higher the endogenous value. Although not obvious, this lens is concerned with the player’s motivation, and particularly to what is valuable to them, which makes this lens appropriate to use when discussing the sub-theme “rewards”.

In order to use this lens, Schell (2008) encourages designers to answer the following questions: “What is valuable to the players in my game?”, “How can I make it more valuable to them?” and “What is the relationship between value in the game and the player’s motivations?”.

As I discovered during both workshops, the teens consider gaining new skills, points and coins as a necessary part of a game in order to get motivated to play it. The way I can make those things more valuable for them is by making them more exclusive i.e. harder to achieve but not too hard either because than they will give up playing. There needs to be a good balance between how many points and coins you get for each effort and how fast the character gains a new skill. A way to do this, is when the characters XP increases, the enemies become harder to beat in the higher levels. There should be a direct relationship between value in the game and the motivation, but an inner motivation to achieve a successful transition and check items off from the check-lists, should also motivate them. Therefore, the check-lists should be visually incorporated into the game.

5.2.5 The Lens of Goals

This lens is a perfect match with the theme “goal of the game” as they are both concerned with the goals of the game. When using this lens, the focus is on finding out whether the goals of the game are appropriate and well-balanced (Schell, 2008). The questions from this card are: “What is the ultimate goal of my game?”, “Is that goal clear to the players?”, “If there is a
series of goals, do the players understand that?”, “Are there different goals related to each other in a meaningful way?”, “Are my goals concrete, achievable and rewarding?”, “Do I have good balance of short and long term goals?”, “Do players have a chance to decide their own goals?” and “Do the play testers enjoy this game enough?” (Schell, 2008). The last question is not relevant for me because I don’t have a playable version of the game, but the others are interesting to explore to see if the goals of the game have been properly defined through the workshops.

The ultimate goal of the game is to complete the check-lists and defeat the final boss that is nested in the final level of the game. The goal of the check-lists should be very clear to the players, as it should be the motivation for playing the game in the first place, while where the final boss is, is something they will discover while playing the game. Along the way in the game there will be enemies, but at the end of each level, there is going to be a boss that represent the sub-goals of the game. The goal of completing questions from the check-list and defeating bosses are connected since in order to beat the bosses and move on to the next level, the player needs to answer the questions from the check-lists. This way, the goals are interrelated, where the check-lists represent the learning part, and fighting enemies is the fun part, and together they offer support to the teens both in the terms of distraction and becoming more independent in order to get ready for transition.

The goals are very concrete and achievable, both those that need to be done in real life, and those in the game, as the plan is to increase difficulty of defeating bosses, as the XP level rises and the character becomes more powerful in the game. Short term goals are to earn points, coins and gain XP, so in order to balance that, after an appropriate amount of time that should be adjusted after playtesting so that it’s neither too long nor too short, a boss that represents a long term goal, will show up and the player can move to the next level.

As some teens with health challenges might not need to achieve everything from the check-lists, the game should enable a “Not relevant” option so that they can get a new question instead. That way, the players can get a chance to decide which goals are and which aren’t relevant for their health situation.

5.2.6 The Lens of Reward

If you want to figure out whether your game is giving out the right rewards, in right amount, at the right time, Schell (2008) recommends the use of The Lens of Reward. This lens
matches the theme “motivation” and particularly the sub-theme “rewards” as they discuss the same game element, which is rewards. Where the sub-theme “rewards” grouped only the types of rewards that the participants wished for, The Lens of Rewards asks the following questions: “What rewards is my game giving out now?” Can it give out others as well?”, “Are players exited when they get rewards in my game, or are they bored by them? Why?”, “Getting a reward you don’t understand is like getting no reward at all. Do my players understand their rewards?”, “Are the rewards my game gives out too regular? Can they be given out in a more variable way?”, “How are my rewards related to one another? Is there a way they could be better connected?” and “How are my rewards building? Too fast, too slow, just right?” (Schell, 2008).

Some of the questions from this lens, like whether the rewards are building too fast or too slow, are only useful if you have a more developed version of your game. While other questions, such as those regarding whether the players understand the rewards or get bored by them, are not interesting to analyze for me because I got suggestions for what kind of rewards the game should have by the teens themselves. On the other side, questions about whether the game can give out some other rewards than the current ones, how the rewards are related and whether the rewards are too regular, are worth further exploration.

Schell (2008) explains that players wish to be judged favorable, and the best way of fulfilling that need in a game is by giving them rewards when they do something right. Further, he splits up rewards into the following categories: praise, points, prolonged play, a gateway, spectacle, expression, powers, resources and completion.

As I mentioned before, skills, coins, points and some general benefits were suggested as rewards in the game by the participants from both workshops. In workshop 2, one of the benefits from being able to cross an item of the check-lists when your character dies, was the ability to resurrect instead of being sent back to last saved point in the game. All rewards are connected in the same way, if you did something from the check-list, you get new skills, coins or points for that.

Another rewards that were briefly mentioned in workshop 2, was armor and new wand that the player could buy with the help of coins. These are all quite regular rewards that any game possesses, so it might be more interesting for the players if the game offered some special rewards, perhaps an interesting sound that plays when you do something right, which Schell (2008) characterizes as praise and describes as being the simplest of rewards.
A way to keep players in suspense as to what kind of reward they will get when, is by making the rewards variable according to Schell (2008).

As the ultimate goal of the game is to complete all questions from the check-lists, the completion that will lead to the teens becoming independent and ready for transition will serve as the ultimate reward in the game.

5.2.7 The Lens of World

The Lens of World is connected to the theme “Type of world”. The game world is something that Schell (2008) proposes should have power and integrity, and plays the role of a doorway to a magic place that exists in the players imagination. Questions from this lens are: “How is my world better than the real world?”, “Can there be multiple gateways to my world? How do they differ? How do they support each other” and “Is my world centered on a single story, or could many stories happen here?” (Schell, 2008).

The game world will be better than the real world because there the players won’t have their disabilities and can create a world of their own where they can decide what happens.

Since the transition game is based on check-lists, the game should make at least as much sense as the check-lists do by having a dictionary option that came up during workshop 1. The check-lists are in this sense another gateway to the world of transition, while the transition itself is something that the teens are going to experience when they turn 18. Until that happens, this game will serve as a preparation. But the things from the check-lists still need to be done personally, and not in the game, so it includes involvement from the real world. Therefore, it is very important that the imaginary world is compelling enough so that the players would want to do all those things in real life in order to progress in the game.

If the questions from the check-lists are to be altered in a way that the players have to know the answer and choose the right answer instead of a yes-no format as it is right now, it would be necessary to make sure that the players don’t need to look at the check-lists as well in order to understand which question they are crossing off.

Many different stories could happen here if we consider what the players need to do in the real world and the imaginary world need to correspond. Also, as I mentioned earlier, some questions are not suitable for everyone, so different players could experience different things. In addition to this, the world will have different areas that are open for exploration on
different levels, and the order in which the players explore them will be up to themselves. This will lead to different stories, instead of just having to follow one path, as they can choose when to go on which quests.

5.2.8 The Lens of the Avatar

Players should be able to successfully project themselves into their avatar in order to establish a bond and actually care about what will happen to their character. The best way to do that, according to Schell (2008), is by allowing the players to create an *ideal form* which is a better and improved version of themselves, a *blank slate* that the players can relate to or a mixture of those two. An option where the players can put their faces on an avatar or have one that looks exactly like them, won’t work in the long run because, as Schell (2008) puts it: “*people don’t play games to be themselves – they play games to be the people they wish they could be*” (Schell, 2008, p. 314).

This lens matches the theme “characters” and is a particularly good fit with the sub-theme “customize”. The way Schell (2008) proposes for the game designers to ensure that the avatar brings out the player’s identity, is by asking themselves these questions: “Is my avatar an ideal form that will appeal to my players?” and “Does my avatar have iconic qualities that let a player project themselves into the character?”.

In this case, the participants from both workshops expressed that they would like to be able to customize the characters, and in that way turn them into an ideal form of themselves which is an idea that, according to Schell (2008), appeals to game players and makes them project themselves into the game.

An iconic quality belongs to the *blank slate* category (Schell, 2008), and is something that neither I, nor the participants considered during the workshops, and will therefore not include it into the possibilities of the avatar.

5.2.9 The Lens of Character Function

The Lens of Character Function also fits well with the theme “characters”, but is more suitable for the sub-themes “different roles” and “enemies”. The questions from this lens should make the game designers ask themselves: “What are the roles I need the characters to fill?”, “What characters have I already imagined?”, “Which characters map well to which
roles?”, “Can any characters fill more than one role?”, “Do I need to change the characters to better fit the roles?” and “Do I need any new characters?” (Schell, 2008).

The roles that were brought up in the workshops can be translated into the following character functions: hero, mentor, assistant, tutor, background characters, minions, bosses, and a final boss.

The characters that have come up during the workshops are people, magical creatures in general, healer, necromancer, good witch, evil witch, evil doctor, frog-like creatures in different sizes, fairies, and wolfs. Healer, necromancer, and a good witch were all selected as a hero in the story, fairies and wolfs were identified as creatures that live in the magic forest and are background characters, just like the people that live in the cities and can give hints to the player as to where to go or what to do next. Evil witches and evil doctors were considered bosses in the games, alongside the frog-like creatures where the rule was: the bigger the creature, the more difficult should it be to defeat it, see Figure 5.4.

There is in fact a need for new characters, so new questions arise that didn’t get answered during the workshops, but are crucial to the game. Those questions are: what kind of characters should play the role of an assistant, tutor and mentor, and should there be several different characters or can one type fill more than one role?

Another question that didn’t get discussed was whether one character could fit several roles, but there is a possibility to reuse a doctor and a witch, meaning that they are mentors or tutors or both in the beginning, and then become evil in the end and become the final boss. This type of character change is not uncommon in games, one example is the game Eternal Sonata
developed by tri-Crescendo (“Eternal Sonata,” 2016), and even Schell (2008) proposes it as a way of using the same character to fill several roles.

A character that could be changed to serve another function, is the wolves or woodland fairies that could be an assistant instead of just a background character. The wolf was even jokingly suggested as a companion to the hero in workshop 2, but it could be a good idea to have a character that can help the hero along the journey.

When we in workshop 2 discussed what should be the point of defeating the final boss, the participants were unsure. They suggested some type of reward, but if the game is over, the player won’t be able to use it. So I suggest that in order to give the players a rewarding ending, and make the story stronger, the goal should be that the hero needs to rescue the hostage that is released when the final boss is defeated. In that case, the role of a hostage should be added to the list of character functions.

5.3 New Lenses

Schell’s (2008) A Deck of Lenses is useful when designing a game for commercial purposes, but when it comes to designing serious games, and in this case particularly transition games, with and for teenagers with health challenges, there is a need for other lenses in addition. I propose to add the following lenses to the list: The Lens of Transition and The Lens of Knowledge. These lenses are here to cover the transition part of the game design, and particularly the theme “check-lists” that was very much discussed during the workshops.

5.3.1 The Lens of Transition

To further explore the experience of transition, there is a need for a card that represents the lens of transition. So the question that designers need to ask themselves is: How to implement the transition element into the game?

The ultimate goal of a transition game would be to have a successful transition. In order for patients to have that, they need to learn about their rights, take over the responsibilities of tracking their own health and familiarize themselves with the adult clinic. The check-lists provided by Ahus (“Brosjyrer,” 2016) are supposed to help with that. Therefore, implementing the check-lists into the game would be a good idea, and both the members from the Youth Council that participated in workshop 1 and the teens from workshop 2, agreed
with that. This way, the players will get ready for the transition and become as independent as their health challenge allows them to be.

5.3.2 The Lens of Knowledge

Playing games is a fun way of getting distracted from the situation that the teenagers with long term health challenges find themselves in. But in order to find out if the game is capable of distracting its players from their health situation and at the same time help them with the transition, the designer needs to ask: Does my game generate knowledge without the players even realizing it?

It is impossible to have a transition game and at the same time make the players forget what the game is really about, especially since it requires doing task in the real world to get reward in the game world. But, what is possible, is to make the game so much fun that the players want to cross off items from the check-lists in order to progress in the game. That’s why it’s important that both the game world and the story are engaging and appealing to teenagers, as well as enabling them to play the game for years even.

Although, if the questions from the check-lists are to be altered as suggested in the second workshop so that they have multiple choice answers, the players could be so immersed into the game, that they don’t really notice the questions. If they need to go and read somewhere to find the answers, they will get interrupted and maybe not bother to continue playing, but if the answers are hidden around in the game world, they wouldn’t have to stop playing to find answers, but rather collect the answers while playing and then be able to see what answers their avatar has collected when they run into a question on their quest. This way, one of the goals of the game will be to collect as many answers during the game, and that way learn without realizing that you are learning. By playing the game the teens will get distracted as they will focus on collecting answers and rescuing a hostage, and stop thinking about their own health situation.
5.4 Key findings

Based on the analysis, I present the following key findings:

1. Questions from the check-lists should be presented to the players one question at the time.
2. Players should get the questions from the check-lists while on quests or as a way to revive their avatar.
3. A transition game must first and foremost be fun to play and the game should include rewards throughout in order to motivate the players.
4. When a player achieves a goal, he/she should get rewarded for it.
5. It is important that the players receive constant feedback on the matter of how many questions from the check-lists they have answered, and how many more they have left.
6. Older participants had more success connecting the game story elements and mechanics to the transition concept.
7. Design methods need to involve tools that are understandable and easy to use for participants in order to generate game ideas.
6 Discussion

In this chapter I will discuss my findings in light of previous research that has been conducted on the relevant topics. The discussion will be organized in the three sub-questions that this thesis has aimed at answering. In the end of the chapter, I will reflect on the design process.

6.1 Can check-lists be fun?

The first sub-question asks whether check-lists that the teenage patients use during their transition, particularly the ones at Ahus, can be implemented into a game in a fun way. As there is no current literature that discusses that particular issue, I have looked for other ways that the check-lists have been made more fun. One of them was the KOOLO app that I mentioned in chapter 2.3, where one of the app functions was to implement the check-lists.

What they did was that they allowed the users to remove some of the items from the lists that are not relevant, add new ones that are not represented by the check-lists from before, as well as mark items as resolved or as work in progress. The final game idea, that I wrote about in the recap of the analysis chapter, supports these findings and proposes that the check-lists should be implemented in a way that the players will get one question at the time, and as I pointed out before, if a question is not relevant for the player, he/she will be able to remove it and get a new question instead (finding #1).

While in my workshops I had categories “need to have”, “can have” and “shouldn’t have”, research done by Aasen (2014) focused on finding out what functions in a transition app would be “cool to have” and “must have”.

Zhao et al. (2015) didn’t include a check-list as a part of their transition app, instead, they focused on other functions which were: reminder, mood and health, feedback, help contact and memo. Reminder is similar to the check-lists, in a way that events and task that are related to self-management of their illness, show up and users have to check off the items when they complete them in the same way that one would cross things off a check-list.

There was also some difference in the matter of how the check-lists should be implemented so that they are fun. While participants from the first workshop found the idea of bosses in the game asking them the questions from the check-lists was fun, participants from the second
workshop preferred to get the questions while on quests or as a way to revive their avatar. But considering that I only had two participants in the workshop 2 and didn’t have a playable version of the games, just concepts, and the teens were healthy, it is not clear whether the idea of bosses asking questions from the check-lists is fun or not. On the other hand, suggestions from the second workshop didn’t get a chance to be evaluated by teens, so it is quite possible that only the two participants consider it to be a good idea (finding #2).

6.2 How to motivate teens?

The next sub-question asks specifically for what a game needs to have in order for teens to be motivated to play it. Wilson and McDonagh (2012) suggested that a game needs to have goals, feedback, rewards and curiosity, in order to fulfill patients’ needs during a transition. What I discovered during this master project, in many ways complies with their research. Different types of rewards were central in every discussion I had with my participants, and it was seen as a big motivational factor for playing a health game in the first place (finding #3). Curiosity didn’t come up, but based on the participants’ statements, it was important for the game to motivate them to play it, which can as I explained while using The Lens of Curiosity, be connected to the player’s curiosity. Goals were also central in every discussion, and by achieving a goal, a player would get rewarded (finding #4). It was also important for the participants that they receive feedback during the game about how many questions they have answered and how many they have left (finding #5).

Khaled and Vasalou (2014) found out that boys age 10 that have played games regularly, wished for, amongst others, customization of both the characters and the game world, being inspired by the games they regularly play. The participants were able to contribute to the story, but when it comes to ideas concerning the game mechanics related directly to the serious part of the game, in this case conflict resolution, they were unable to connect them meaningfully to the regular game mechanics (Khaled and Vasalou, 2014). Because the participants in my workshops were older (17 to 21 years), they were able to better include the transition element in the game. But this was not an easy task for all of the participants, and particularly the younger participants from workshop 1 and participants without health challenges from workshop 2, were having trouble to connect the game story and mechanics to transition (finding #6).
6.3 What are appropriate methods?

In order to be able to answer on the last sub-question in this thesis, I need to ask whether the methods that I used in this master project are useful when designing a transition game with and for young adults. As the chosen methodology in this master project was PD, it makes sense to compare the findings to other researchers that have used PD to design a health game.

Khaled and Vasalou (2014) discovered during their research with children, that the participants who had domain knowledge and were familiar with the qualities of a game, were able to produce effective ideas that helped further the design of the game. This is similar to what I experienced in this project, where participants from the first workshop, the Youth Council, had domain knowledge and were familiar with games, were able to contribute with game ideas. Even though the participants from the second workshop lacked the domain knowledge, they were still able to, thanks to their extensive knowledge of games, work further on the design ideas from workshop 1 and choose the elements that they considered the most fun. Because as Khaled and Vasalou (2014) experienced, it is important to devise boundary objects that relate to the participants’ expertise, which is why my methods involved tools that were easily understandable for the participants and that they were able to work with in order to be able to together explore the design space (finding #7).

Kayali et al. (2015) established through PD exercises with children ages 8-14 that a gamified communication tool for children and adolescents after cancer treatment should accommodate for different play styles, such as fighting or exploration, in order to satisfy the different needs that vary both between the age groups as well as the genders. Considering that the participants in both of the workshops were older than the children from Kayali et al.’s research, it is difficult to compare them, especially since my participants weren’t separated by gender or age. Even so, I ended up with three mixed groups, but where one group consisted of a boy and girl over 20 years, another was three girls from 17 to 19 years, and the third group was a boy 17 and a girl 21, I was able to see some differences. The older group was able to make a more coherent story in the game, similar to the older children in Kayali et al.’s (2015) research, while the younger group focused more on specific game elements (finding #6).
6.4 Reflection on the design process

If we look at the design process led by the use-oriented design cycle, we can conclude that this project has gone through one design iteration. Namely, after reading about current interventions within transition and health games in general, I have explored the “real life situation” and made an effort towards “understanding practices”. This also helped me place my thesis within the current research field, and acknowledge that the topic transition games have not been thoroughly explored.

Research on PD methods with and for teenagers, provided by Mazzone et al. (2008) amongst others, helped me design my own methods which I used to collect data from the target group. During the next phase, I “identified needs, wishes” of the Youth Council and established what kind of game elements they like by “describing requirements”. Since this is a PD approach, at workshop 1, we conceptualized a game idea together in each group, which I used after the workshop in the in-between phase to “concretize, materialize” those ideas into two low-fidelity prototypes. In workshop 2, participants “tested, evaluated” those prototypes by choosing the parts that they considered to be fun, and also by going back to “identifying needs, wishes” phase where they expressed how they would prefer the game to be like.

In this context, the design process has not only led to a materialized idea, but also generated knowledge that can benefit the research community as a whole.
7 Conclusion

In this thesis I have investigated whether computer games can be used during the transition between children’s hospital and the adult clinic to prepare teenagers with long term health challenges. To sum up the findings of this research, and answer the research question, I shall first answer the sub-questions, before concluding with the main question.

When it comes to how to implement the check-lists in a game in a fun way, it appears that the teens would enjoy to get rewarded in the game each time they answer the question right. Questions from the check-lists should appear in the game one at a time, and it should be possible to get a new question if a question is not suitable for that particular player.

The elements that a game needs to have in order to motivate the teens to play it are rewards, different types and customization of the characters, supernatural or future time game world, treasure hunts and quests.

Methods that are most useful when designing a transition game with and for teens are methods with cards where the participants can either sort them (GDC) or place them on a map (GDW), and most importantly use them as an inspiration for designing a game.

To finally sum up this master project, teens with long term health challenges can see the value of using computer games to prepare them for their transition to adult health care, but this is something that should be researched more.

7.1 Contribution

The contribution of this research can be divided into several things. One of them is the two methods that I have designed, which are the Game Design Cards (GDC) and the Game Design Workshop (GDW), as well as the cards themselves that were used in the workshops. The other contribution is the theoretical approach to game design by the use of A Deck of Lenses. The third contribution are the findings. The final contribution is the game ideas itself that was designed both in collaboration with teens that have long term health challenges (workshop 1), and with healthy teens (workshop 2).
7.2 Future work

The research on transition games are only in its infancy, and this master project was an attempt to show the importance and possibilities on use of games during transition. The best way to continue this research in true PD spirit, would be to use the findings from this research and use them as a starting point with a new group of teens with long term health challenges. It would be particularly useful if the teens have reflected around the transition, like the teens from the Youth Council have, as it will enable them to engage fully in the design of the game.

Further, it would be interesting to see these findings implemented into a functional game prototype and evaluated by teens with long term health challenges. It would then be possible to determine if teens that had access to the game were better prepared for the transition to the adult clinic than teens who only have access to the check-lists.


Bratteteig, T., Ødker, K., Dittrich, Y., Mogensen, P.H., Simonsen, J., 2013. Methods: Organising principles and general guidelines for Participatory Design Projects, in:


Machniak, M., 2013. Sprinklr: Designing a “cool” health-oriented social networking site with and for teenagers.


Medienorge, 2013. Mer enn bare tidsfordriv.


Wilhelmsen, K., 2013. På vei mot et ungdomsvennlig sykehus.


Appendix A

Collective informed consent used in workshop 1

Forespørsel om deltagelse i KULU
Design av kul teknologi med unge med langvarige helseutfordringer

1. Bakgrunnsinformasjon

Vi er en forsker og en gruppe masterstudenter ved Institutt for Informatikk, Universitetet i Oslo. Målet vårt er å lage kule digitale teknologier som støtter ungdom i sin hverdag, hjemme, på skole, og i sykehuset når de har langvarige helseutfordringer. Vi skal organisere intervjuer og design verksteder med ungdommer med langvarige helse-utfordringer i alderen 12-18 år (alene eller i små grupper). Vi har ingen vanskelige spørsmål og du trenger ingen spesielle ferdigheter om å være med.


2. Hva innebærer studien?

Vi ønsker å invitere ungdommer med en lanvarige helseutfordring til verksteder og intervjuer om design av ny sosiale medier og apper for unge pasienter. Vi skal møtes på Ahus.

Vi har allerede lagt en prototype av et lukket sosialt nettverk sammen med ungdommer (med og uten sykdom) og vi skal jobbe videre med dette, i samarbeidet med deg. Vi skal snakke om prototypen: hvordan forbedres og hva trenges. Vi skal også snakke om hva slags apper kan hjelpe unge pasienter i å takle livet som pasient. Etter vi har lagt en prototypen, kan du være med i å teste den.

Intervjuet kan ta opp til en halvtime. En workshop kan ta opp til tre timer.

3. Mulige fordeler og ulemper

Det vil ikke være noen ulemper ved å delta i dette prosjektet utover eventuelt ubehag knyttet til intervju situasjonen.

Fordelene ved å delta er at du som deltaker kan bidra til at de nye teknologier vi skal utvikle kan hjelpe deg og andre ungdommer i liknende situasjon som deg.

Det er frivillig å delta i dette studiet. Du kan når som helst trekke deg fra studiet uten å oppgi noe grunn til dette. Dersom du ønsker å delta, er det fint om du kan undertegne den vedlagte samtykkeerklæringen.
4. Hva skjer med informasjonen om deg?

I intervjuet og workshoper noterer vi på en papirblokk og bruker en lydopptaker. Vi renskriver notatene med hjelp av lydopptaket på PC rett etter intervjuet eller workshopen og deretter makuleres papirene og filen på lydopptaket slettes. Om deltakere opplyser vi bare kjønn, alder, og generell diagnose (for eksempel diabetes; hjertesykdom; kreft; autoimmune sykdommer, osv.). Vi skal ikke snakke om din sykdom.

En kode skal knytter deg til din opplysninger gjennom en navneliste. Kun autorisert personell knyttet til prosjektet har adgang til denne navnelisten.

Når vi skriver om prosjektet på prosjekt-websiden eller rapporter, skal ingen enkelpersoner vil være gjenkjennelige.


5. Kontaktinformasjon

Hvis du har noen spørsøk angående studien eller hvis du har senere lyst til å trekke deg, kan du kontakte oss på tlf. 2285 2816 eller sende en e-post til Maja van der Velden ved Institutt for informatikk, majava@ifi.uio.no. Du kan også kontakte Kjersti Wilhelmsen, koordinator Transisjonsprosjektet Ahus sykehus, Kjersti.S.Wilhelmsen@ahus.no eller på telefon 4121 0027.

Samtykke til deltagelse i studien

Jeg er villig til å delta i KULU prosjektet. Jeg vet at:

☐ Jeg kan trekke mitt samtykke uten å oppgi noen grunn
☐ Jeg har rett til innsyn og sletting av opplysninger om meg

______________________________________________________________
(signert av prosjektdeltaker, dato)

Stedfortredende samtykke:
(for ungdommer 12-15 år)

______________________________________________________________
(signert av forelder/verge)

Jeg bekræfter å ha gitt informasjon om studien:

______________________________________________________________
(forsker, dato)
Appendix B

Consent form used in workshop 2

Samtykeskjema for deltagelse i design verksted som en del av et masterprosjekt om design av transisjonsspill med ungdommer som har langvarige helseutfordringer

1. Bakgrunnsinformasjon
Jeg er en masterstudent ved Instituttet for Informatikk, Universitetet i Oslo som tilhører KULU prosjektet og går ut på å lage kule digitale teknologier som støtter ungdom med langvarige helseutfordringer. Målet med masterprosjektet mitt er å undersøke om hvordan man kan designe for gøy i transisjonsspill med ungdommer med langvarige helseutfordringer. Transisjon eller overgang er et begrep som brukes om overføringen fra et barneorientert til et voksenorientert helsetilbud.

2. Hva innebærer dette verkstedet?
Jeg har allerede hatt ett design verksted med ungdommer med langvarige helse-utfordringer i alderen 17-21 år hvor vi har sammen kommet opp til 2 forskjellige idéer til et spill som skal ha med transisjon. Målet med dette verkstedet er å jobbe videre med disse idéene og finne ut hvordan de kan forbedres og hva mer trenges for å lage et morsomt spill. Vi skal også snakke om hva er en transisjon og hvilke helsereettigheter man har som ungdom. I den sammenhengen blir dere bedt om å fylle ut noen spørreskjemaer og reflektere rundt dette.
Dette verkstedet kan ta opp til to timer.

3. Mulige fordeler og ulemper
Det vil ikke være noen ulemper ved å delta i dette verkstedet.
Fordelene ved å delta er at du som deltaker kan bidra til forskning som kan hjelpe ungdommer med langvarige helseutfordringer i fremtiden. Du kommer også til å få mulighet til å sette deg inn i situasjonen til ungdommer med langvarige helseutfordringer, og også lære hvordan man går frem for å designe for et morsomt transisjonsspill.
Det er frivillig å delta i dette verkstedet. Du kan når som helst trekke deg fra verkstedet eller trekke informasjonen som du har bidratt med uten å oppgi noe grunn til dette.

4. Hva skjer med informasjonen om deg?

Forskningsprosjektet er meldt til NSD (Norsk Samfunnsvitenskapelige datatjeneste), personvernombudet for alle norske universiteter, høyskoler og flere sykehus og forskningsinstitusjoner. Når masteroppgaven er ferdigstilt skal all innsamlet materiale utover selve masteroppgaven slettes.

5. Kontaktinformasjon
Hvis du har noen spørsmål angående studien eller hvis du har senere lyst til å trekke deg kan du kontakte meg på tlf: 92488250 eller sende en e-post til meg (Aleksandra Hrpka) på aleksahr@ifi.uio.no. Du kan også ta kontakt med hovedveilederen min ved å sende en e-post til Maja van der Velden ved instituttet for informatikk, majava@ifi.uio.no.

6. Samtykke til deltakelse i verkstedet
Før verkstedet begynner er det fint om du samtykker i deltagelsen ved å undertegne på at du har lest og forstått informasjonen på dette arket og at du ønsker å delta i verkstedet.

Jeg er villig til å delta i design verkstedet. Jeg vet at:

• Jeg kan trekke mitt samtykke uten å oppgi noen grunn

• Jeg har rett til innsyn og sletting av opplysninger om meg
Jeg bekrer at jeg har fått informasjon om studien:

(signert av deltakeren, dato)

(forsker, dato)
Appendix C

Evaluation of workshop 2

Evaluering av workshopen

Denne undersøkelsen er anonym og kommer til å bli brukt for å evaluere workshopen og finne ut om noe kan forbedres til neste gang. Der hvor det er en skala fra 1 til 5, sett en ring rundt ett av alternativene. Der hvor det er plass til fritekst er du oppfordret til å svare mer utfyllende med egne ord.

1) Var programmet passende - hadde du nok tid til alt?
   Ikke passende 1 2 3 4 5 passende

   Fritekst:_____________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

2) Føler du at dine meninger ble hørt og tatt med videre?
   Ikke hørt 1 2 3 4 5 hørt

   Fritekst:__________________________________________________________________
   _______________________________________________________________________
   _______________________________________________________________________

3) Er du fornøyd med bidraget ditt til prosjektet?
   Ikke fornøyd 1 2 3 4 5 veldig fornøyd

   Fritekst:__________________________________________________________________
   104
4) Var aktivitetene morsomme å være med på?

Ikke morsomt 1 2 3 4 5 morsomt

Fritekst:_______________________________________________________________

____________________________________________________________________

5) Var alle aktivitetene forståelige?

Ikke forståelig 1 2 3 4 5 forståelig

Fritekst:_______________________________________________________________

____________________________________________________________________

6) Har du opplevd noe som ikke var bra eller ukomfortabelt?

Fritekst:_______________________________________________________________

____________________________________________________________________

7) Er det noe som kunne ha blitt gjort annerledes?

Fritekst:_______________________________________________________________

____________________________________________________________________

Tusen takk for all hjelpen, det setter jeg veldig stor pris på 😊
Appendix D

The revised version of “My Health” check-list used in workshop 2

<table>
<thead>
<tr>
<th>Kunnskaper og ferdigheter</th>
<th>Dette kan jeg!</th>
<th>Dette trenger jeg å jobbe med</th>
<th>Dato oppnådd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rettigheter og medvirkning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jeg ligger til at jeg kan snakke med min behandler alene</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jeg ligger til min rett til informasjon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jeg ligger til min rett til medvirkning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jeg ligger til min rett til informert samtykke (fra 16 år)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dette vil jeg bli bedre på:</th>
<th>Dette skal jeg gjøre for å lære meg dette</th>
<th>Nå kan jeg dette</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
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<tr>
<td>2</td>
<td></td>
<td></td>
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<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Appendix E

The revised version of “Ready for transition” check-list used in workshop 2
Appendix F

Prototype 1 based on idea from group 1 from workshop 1
Appendix G

Prototype 2 based on idea from group 2 from workshop 1
Appendix H

Cards that were used in the analysis from the A Deck of Lenses