# User Interfaces of Mobile Dress-up Games

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Dress-up games are a popular genre among younger girls. Despite the popularity, the technical side of dress-up games has not been extensively studied before. This thesis aims to fix that by introducing their user interfaces. As dress-up games are nowadays mostly on mobile, the thesis focuses on mobile dress-up games. The objective of this thesis is to give an extensive overview of the user interfaces of dress-up games by presenting their history and common qualities. Another objective is to test how the user interfaces affect the user experience.

The qualities of the user interfaces of mobile dress-up games are studied by using a sample of 50 Android dressup games. The games are examined one by one with a set of predefined questions to help in the analysis. Commonly used user interface elements are also defined along with layouts that are found to be common in the games. With this method, two widely used user interface styles are found and several aspects of the user interfaces are analysed in detail.

The user experience is tested by developing a game with three distinct user interfaces. A test group is gathered to test the game and answer to a questionnaire about their opinions on the different aspects of the user interfaces. The results are then presented and analysed. Due to a small test group, the results are not conclusive, but they do indicate some patterns in preferences. Most of the testers preferred a certain user interface, and the analysis reveals why that is.

Keywords: dress-up games, user interface, user experience

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Pukemispelit ovat suosittuja nuorten tyttöjen keskuudessa. Suosiosta huolimatta pukemispelien teknisestä puolesta ei ole aiemmin juuri tehty tieteellistä tutkimusta, joten tämä tutkielma pyrkii korjaamaan tilannetta paneutumalla pukemispelien käyttöliittymiin. Koska pukemispelit ovat nykyään laajalti siirtyneet mobiilialustoille, tämä tutkielma keskittyy niihin. Tutkielman tavoite on antaa kattava kuva pukemispelien käyttöliittymistä käymällä läpi niiden historia ja yleisimmät ominaisuudet. Toinen tavoite on selvittää, kuinka niiden käyttöliittymät vaikuttavat käyttökokemukseen.

Tutkiakseni käyttöliittymien ominaisuuksia olen ottanut 50 pelin otoksen Googlen Play Storesta. Pelit käydään läpi yksitellen ennaltamääriteltyjen kysymysten avulla. Tämän lisäksi otetaan selvää millaisia ulkoasuja pukemispeleissä yleisesti on ja mitkä ovat niissä yleisimmin käytetyt käyttöliittymäelementit. Menetelmän avulla löytyi kaksi yleisesti käytettyä käyttöliittymätyyliä ja useita käyttöliittymille ominaisia piirteitä.

Käyttökokemuksen testaamista varten kehitettiin peli kolmella eri käyttöliittymällä. Peliä testasi testijoukko, joka vastasi lopuksi kyselyyn, jossa kysyttiin heidän mielipiteitään pelin eri ominaisuuksista. Kyselyn tulokset ja niiden analyysi esitetään tutkielman lopussa. Koska testijoukko oli pieni, tulokset ovat korkeitaan suuntaa antavia. Vastauksien perusteella yksi käyttöliittymä nousi ylitse muiden, ja tarkempi analyysi paljastaa mistä tämä johtui.

Keywords: pukemispelit, käyttöliittymä, käyttökokemus

# Contents

# 1 Introduction

Dress-up games are the paper dolls of the internet. They feature dolls whose appearance can be changed from the color of their skin to the length of their skirts. Sometimes the games have multiple dolls or the doll can be a male instead, or it can even be an animal. Sometimes the doll can be created almost entirely from scratch.

Dress-up games have been around for over 20 years, and they have garnered popularity especially among younger women. If you ask a woman who has been around the internet whether they have ever tried a dress-up game, the answer is likely affirmative. Nowadays the market has mostly moved on to mobile, which is why this thesis centers around mobile dress-up games.

Even though dress-up games have been around for a while, not much research has been done about the subject. Some cultural studies that study the effect the games have on young girls have been done, but technical studies are few and far between. An example of a cultural study is a paper by Nurist Surayya and Djoko Setyabudi [1] in which they examine how dress-up games affect the incidence of materialism in children.

This thesis aims to introduce possibly the most important technical side of dress-up games, their user interfaces. Dress-up games are quite simple in form, as their whole point is to manipulate the user interface to change the doll's appearance. Because the user has to interact with the user interface so much, it has a crucial part in making the user experience smooth and pleasant. To give a proper overview of the user interfaces, this thesis both summarizes common qualities of dress-up games' user interfaces and examines what kind of user interfaces make for a good user experience. The research questions are as follows:

RQ1: What kind of user interfaces do mobile dress-up games generally have?

RQ2: What kind of user interfaces make for a good user experience in mobile dress-up games?

The terms user interface and user experience are often mixed up. Ernest Adams differentiates them well in his book [2] with the phrase "The experience is something that happens inside the player's head. The interface is a part of the game software". In other words, the user interface is what the player uses and the user experience is what the player experiences while using the user interface.

The first part of the thesis tries to answer to the first research question of what kind of user interfaces mobile dress-up games generally have. Before going into what they look like nowadays, their history is first explored in Chapter 2. The chapter is included because dress-up games have evolved a lot since they were first introduced, and their path of evolution has affected their present form. The history of dress-up games' user interfaces is also a rare topic in scientific articles, which makes this thesis possibly the first of its kind.

Chapter 3 goes deeper into analysing the qualities of the user interfaces and showing examples of what they are like using 50 different mobile games as reference. The goal of this chapter is to give the reader an idea of what kind of user interfaces are popular in today's mobile dress-up game market. The results are divided into three parts, which show the common user interface elements, layouts and qualities of dress-up games' user interfaces.

Chapter 4 answers the second research question of how the different user interfaces affect the user experience. This is done by conducting practical research of users' preferences on different user interface styles. The research was done by creating a dress-up game with three distinct user interfaces. A test group was then asked to try the game and fill a questionnaire about it. The game tries to mimic an average dress-up game that can be found on the Google Play Store so that the results can be applied to the current mobile dress-up games on the market. This study aims to not only reveal which user interface the testers prefer the most, but also what qualities they appreciate in user interfaces in general.

# 2 Evolution of the User Interfaces of Dress-up Games

The aim of this chapter is to give a brief overview of how dress-up games and their user interfaces have evolved over time. Although this thesis centers on the user interfaces of mobile games, desktop dress-up games have existed long before them. As they are an important part of the history, they are included as part of the evolution as well. Since the literature on dress-up games and their history is minimal, most of the chapter is based on my own experiences growing up with dress-up games.

Although the word “dress-up games” nowadays refers to the games on the digital platform, the genre has old roots. Paper dolls have existed for over a thousand years [3], and children have played with dolls like Barbie for centuries.

Modern manufactured paper dolls had a clear influence on the layout of early computer-based dress-up games. Figure 1 shows an example of a typical paper doll. Because one would usually cut the parts with scissors or unstick them if the parts were stickers, the dolls came in packs like this where the clothes were scattered around the doll on a sheet of paper.


*Figure 1: A paperdoll from Apu-magazine (year unknown). [4]*

Figure 2 shows a screenshot from a *Kisekae Set System* -game. *Kisekae Set System*, also known as *KiSS*, is a software developed in Japan in 1991. It first became popular in Japan and then slowly gathered international interest in the late 1990s. It is an open standard and anyone with the will and skills could create dress-up games with it. It was the first popular software dedicated to creating dress-up games, so it is quite possible that the very first dress-up games for PC were created using it. [5]


*Figure 2: A screenshot from a Kisekae Set System game. [6]*

Notice that in Figure 2, the clothes are just scattered around the doll like in traditional paper dolls, making the user interface very simple. The user would drag and drop the clothes on the doll, which is similar to how playing with paper dolls works. This paperdoll-like user interface is still sometimes used today, especially on desktop games.

In the early 2000s Macromedia Flash (now known as Adobe Flash) became popular to use. This made dress-up games available to a wider audience and more people were able to develop them as well. Because Macromedia Flash was easy to download and use, even preteens could make their own versions of dress-up games. With so many creators, the genre evolved fast, and the games became gradually more complicated. One would no longer only put clothes on the doll, but choose every detail of the doll's appearance such as the length of their shirt sleeves and the size of their nose. These complex dress-up games were often called "avatar creators" or "character creators".

With the number of options increasing the creators would have to come up with creative ways to present the options to the player. A popular option was to compartmentalise the different choices into

categories. Figure 3 presents an example of a complex avatar creator. On the upper right corner, the player can navigate to the “main categories”, and when choosing a category, the player is presented with additional subcategories. Figure 4 gives a more detailed view on the “Eye shapes” category, which has multiple pages of different eye styles the player can choose from. The player can also choose the color of the avatar’s eyes.

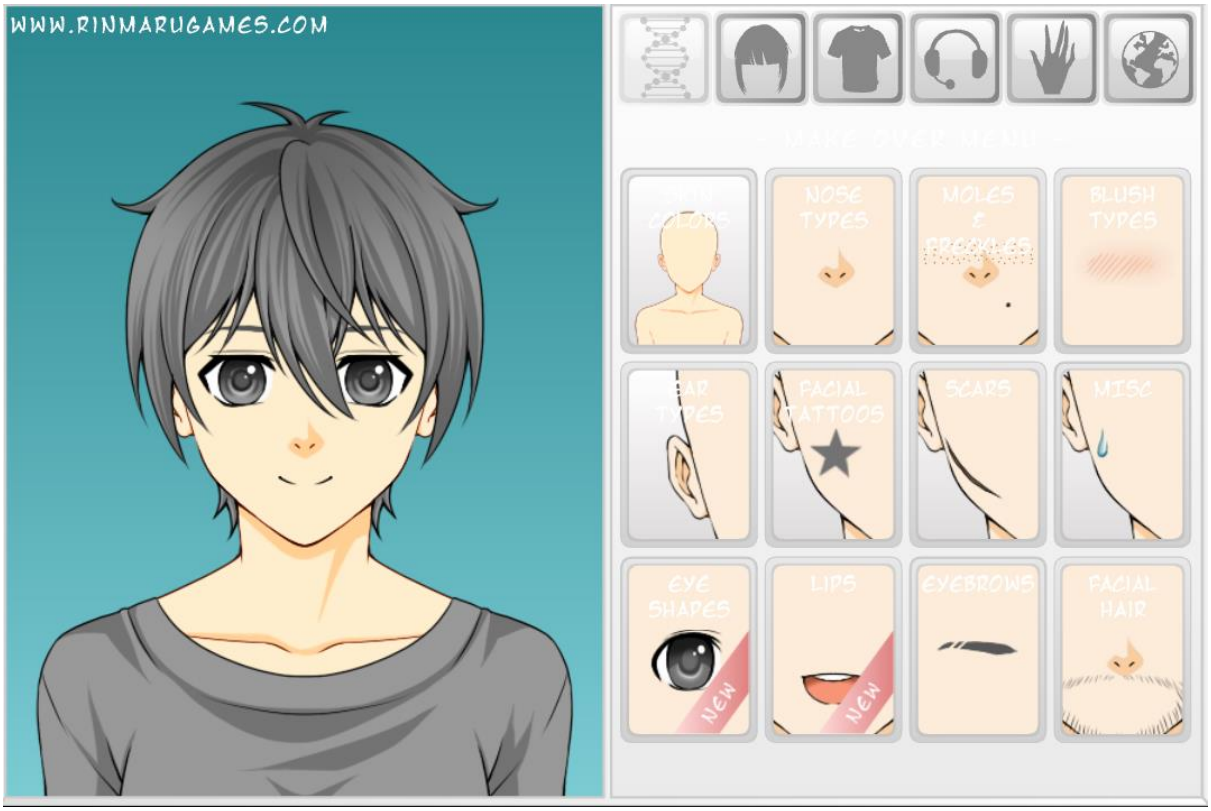


*Figure 3: Screenshot from the game Mega Anime Avatar Creator. This picture shows the user interface for the category “make over”, where the user can change the facial features of the character. As the original website, rinmarugames.com, no longer hosts their games, this screenshot was taken from the site Doll Divine [7].*

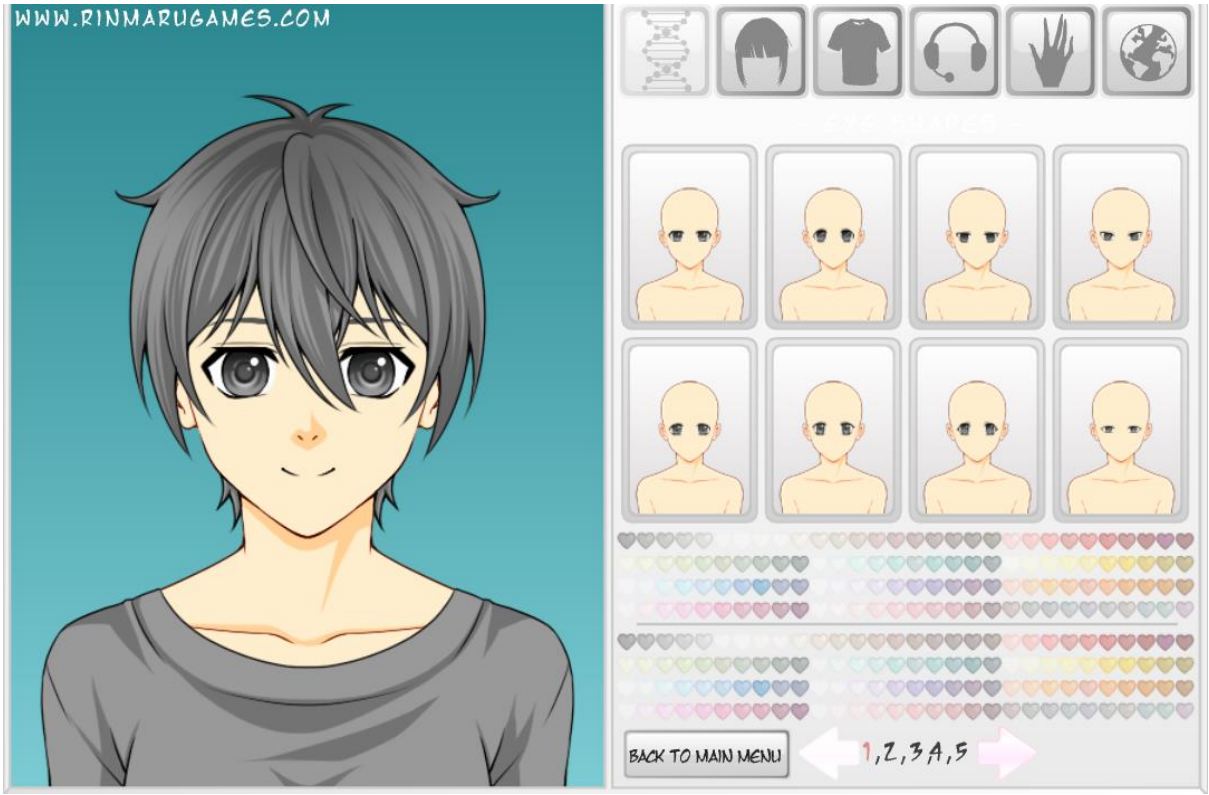


*Figure 4: Screenshot from the game Mega Anime Avatar Creator. This screenshot shows the "eye"-subcategory in the "make over"-category, where the user can change the character's eye style. As the original website, rinmarugames.com, no longer hosts their games, this screenshot was taken from the site Doll Divine [7].*

Nowadays the dress-up game market has largely moved onto smart phones. While the mobile market is monetarily more lucrative, and that is likely a huge reason for the movement, there exists another good reason for it: Adobe, the company who owns Adobe Flash, decided to discontinue its use by the end of 2020 [8]. As Adobe Flash was the program of choice for many dress-up game developers, it was natural that the genre decreased in popularity on desktop. In addition to that, it is now over 10 years since the biggest boom in dress-up games in 2009 (as can be seen in Figure 5), so by now many old-school creators and users have moved on from the genre. Newer browser-based games still exist, but even they are often mainly meant for mobile use.

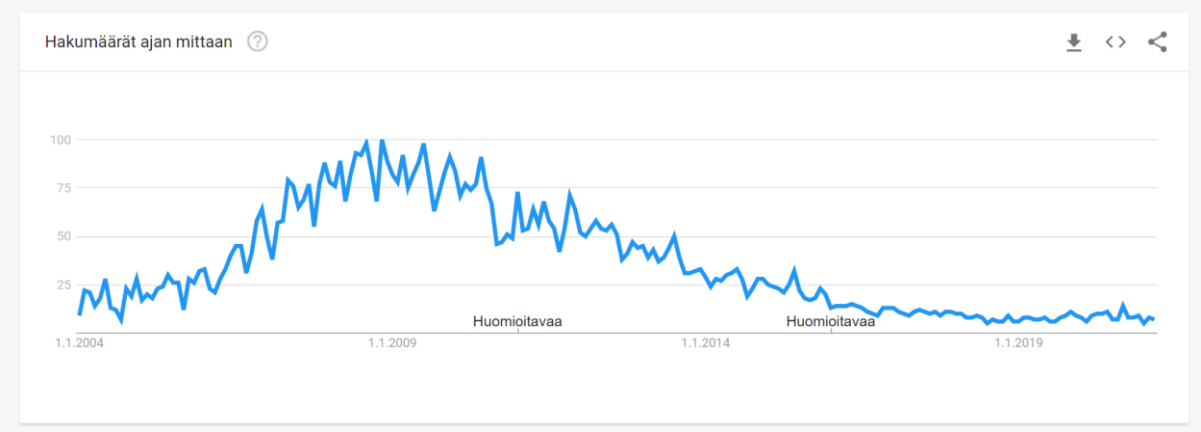


*Figure 5: A screenshot taken from Google Trends. The graph visualizes how popular it was to search the term "dress up games" on Google during a certain timeframe. The vertical direction visualizes the popularity of the search term and the horizontal direction visualizes time. In the late 2000s the search term quickly grew in popularity, and since the early 2010s the search term has gradually decreased in popularity. [9]*

Examples of these newer sites are meiker.io and picrew.me. They offer anyone with artistic skill the possibility to create their own games, and this is likely the reason why they have maintained their popularity; ever since the invention of *Kisekae Set Systems*, a huge draw for dress-up games was that the users could make them themselves. According to Sitechecker (https://sitechecker.pro/), picrew.me had 26,266,451 visitors in the month of February 2021 (see Figure 6), which shows that users still visit websites to play these games.

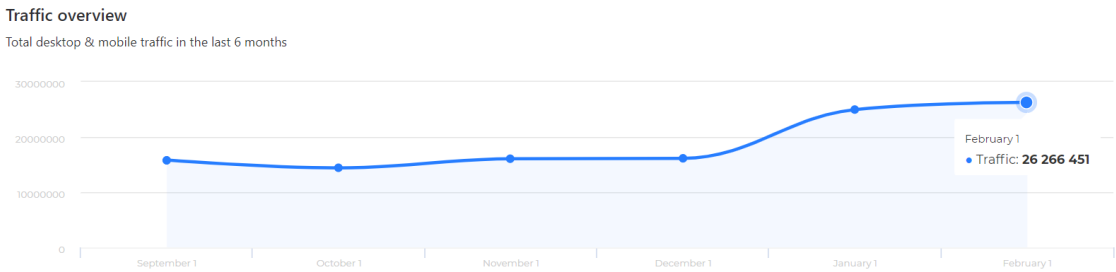


*Figure 6: Graph showing the traffic over the last 6 months for the site "picrew.me". Note that the graph shows visitors for both mobile and desktop. Taken from Sitechecker on 2.4.2021.*

Picrew.me uses a default user interface for all of its games. The interface has clearly been designed for mobile use, as can be seen on Figure 7. It shows a screenshot taken from a picrew.me game on desktop. The layout is vertical, which already shows that the game is designed for mobile, but also the overall user experience on desktop feels clunky, although still usable. To change between main categories, which are shown as smaller icons on the top row, the user has to drag the yellow scroll bar with their mouse. On mobile the scrolling is replaced by swiping, which feels much more natural. Some of the pictures also appear blurry on desktop, which is not that noticeable on mobile. The buttons are also huge, most likely designed for mobile use with fingers.

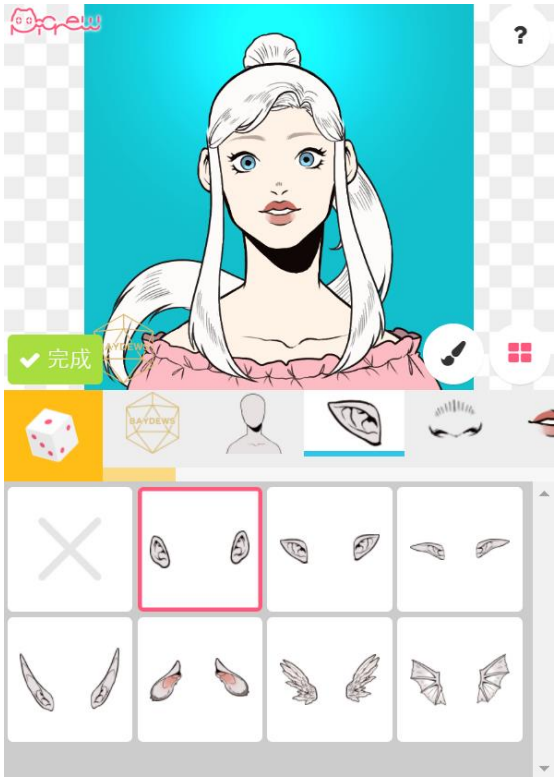


*Figure 7: Screenshot of a picrew.me game called* [BAYDEWS' avatar maker!!] V2 *from a creator called "baydews".*

To compare the popularity of the mobile-based site picrew.me with a more traditional desktop-based site, I ran a traffic check for DressUpWho.com (https://www.dressupwho.com/) on Sitechecker. DressUpWho.com is a dress-up game site started in 2007 [10], around the time when dress-up games were starting to rapidly grow in

popularity. It features games from different creators, and although you can play the games on mobile, they are made to be played on desktop.

Figure 8 shows a graph visualising DressUpWho.com's traffic over the last 6 months. The traffic is much lower when compared to Figure 6 (777,822 visitors in February 2021). The trend for visitors also curves lower and lower in Figure 8, while in Figure 6 it is becoming higher. Although six months is not enough to make conclusive remarks of the trend and comparing just two different sites is not conclusive evidence to point out that one type of site is more popular than the other, the data is still indicative of the differences in popularity between desktop and mobile.

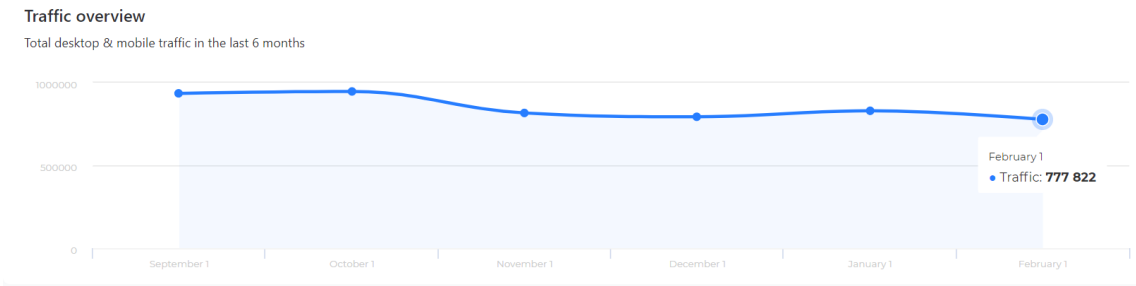


*Figure 8: Graph showing the traffic over the last 6 months for the site "dressupwho.com". Note that the graph shows visitors for both mobile and desktop. Taken from Sitechecker on 2.4.2021.*

# 3 Patterns in the User Interfaces of Mobile Dress-up Games

Dress-up games' user interfaces usually follow the same pattern. The main scene of the game, where the doll's appearance can be changed, has the doll in full view and the user interface elements are positioned so that they do not cover the doll. The user interface elements often consist of buttons. The buttons can be for choosing what clothing categories the user wants to see or for other actions, like randomizing the doll's appearance or saving a picture of the finished doll to the user's phone.

Although the basic user interface is usually as described, there exists many different implementations of arranging the elements in different styles. This chapter presents research focusing on finding common patterns in mobile dress-up games' user interfaces. The research is conducted by going through a sample of 50 Android dress-up games.

## 3.1 The Research Method

To conduct the research, a group of sample games were needed. 50 games were randomly selected from the Google Play Store. The requirements for choosing the games were as follows:

1. The game must be for Android and found on the Google Play Store.
2. The game must be free (additional transactions are allowed, but it must be free to download and play).
3. The game must appear on the Play Store search results page by using one of the following search terms: "dress-up game", "dress up" and "fashion game".

4. The game must have over 100,000 downloads in the Google Play Store.

Based on these requirements, the games were randomly chosen from the search results using the mentioned search terms. The method was to simply randomly scroll and tap on different apps and then add them to the test group if they matched the requirements.

Table 1 gives a list of the selected games. As the data was gathered on the 16th of November in 2020, the data is valid for that date.

*Table 1: List of the games we chose for the analysis. As some parts of the table are in Finnish, here are the translations for the Finnish words to English: Pelin nimi=Name of the game, Latausmäärä=Amount of downloads, Arvostelu=Rating, Viimeisin päivitys=Latest update, Julkaisija=Publisher, Päivämäärä=Date, Roolipelit=Roleplaying games, Kasuaali=Casual, Luovuus=Creativity, Simulaatio=Simulation, Viihde=Entertainment, Opetus=Education.*

| | Pelin nimi | Genre | Latausmäärä | Arvostelu | Arvosteluiden määrä | Viimeisin päivitys | Julkaisija | Päivämäärä |
|---|---|---|---|---|---|---|---|---|
| 1. | Dress up! Time princess | Roolipelit | 1,000,000+ | 4.7 | 58,495 | 05/11/2020 | IGG.COM | 16/11/2020 |
| 2. | Dress Up Games Free | Kasuaali, Luovuus | 10,000,000+ | 4.0 | 62150 | 29/10/2020 | Best Dress Up Games For Girls | 16/11/2020 |
| 3. | Super Stylist - Dress Up & Style Fashion Guru | Roolipelit | 10,000,000+ | 4.3 | 494,016 | 02/11/2020 | Crazy Labs by TabTale | 16/11/2020 |
| 4. | College Student Girl Dress Up | Kasuaali, Luovuus | 5,000,000+ | 4.0 | 35,272 | 05/11/2020 | Teenage Fashion Dress Up | 16/11/2020 |
| 5. | Pastel Girl : Dress Up Game | Kasuaali | 10,000,000+ | 4.4 | 231,276 | 27/10/2020 | SeyeonSoft | 16/11/2020 |
| 6. | Covet Fashion - Dress Up Game | Kasuaali | 10,000,000+ | 4.0 | 734,376 | 11/11/2020 | Crowdstar Inc | 16/11/2020 |
| 7. | Love Nikki-Dress UP Queen | Roolipelit | 10,000,000+ | 4.1 | 412,068 | 28/10/2020 | Elex | 16/11/2020 |
| 8. | Anime Dress Up - Games For Girls | Kasuaali, Luovuus | 5,000,000+ | 4.4 | 47,901 | 05/11/2020 | Anime Dress Up Games | 16/11/2020 |
| 9. | Dress up - Games for Girls | Kasuaali, Luovuus | 5,000,000+ | 4.0 | 35,477 | 29/10/2020 | Best Dress Up Games For Girls | 16/11/2020 |
| 10. | Anime Dress Up: Cute Anime Girls Maker | Personointi | 500,000+ | 4.4 | 3,222 | 06/11/2020 | iBoattech | 16/11/2020 |
| 11. | Red Carpet Dress Up Girls Game | Kasuaali, Luovuus | 5,000,000+ | 4.0 | 30,633 | 29/11/2020 | Fashion Games for Girls | 16/11/2020 |
| 12. | Girl Squad Fashion - BFF Fashionista Dress Up | Kasuaali, Luovuus | 10,000,000+ | 4.2 | 44540 | 12/11/2020 | Teenage Fashion Dress Up | 16/11/2020 |
| 13. | Girls Dress Up | Simulaatio | 100,000+ | 4.2 | 2,471 | 11/11/2020 | Fashion Games For Girls | 16/11/2020 |
| 14. | Momo's Dressup | Kasuaali | 1,000,000+ | 4.5 | 42,879 | 01/08/2020 | maygreen studio | 16/11/2020 |
| 15. | Dress Up Games Stylist - Fashion Diva Style | Roolipelit | 10,000,000+ | 4.2 | 151,724 | 06/08/2020 | Games2win.com | 16/11/2020 |
| 16. | Princess dress up and makeover games | Kasuaali | 10,000,000+ | 4.0 | 30,517 | 14/08/2020 | bonbongame.com | 16/11/2020 |
| 17. | Magic Dress Up | Simulaatio | 100,000+ | 4.2 | 1,135 | 11/06/2020 | 7 Play | 16/11/2020 |
| 18. | College Girls Team Makeover | Kasuaali, Luovuus | 10,000,000+ | 4.1 | 145,752 | 12/11/2020 | Teenage Fashion Dress Up | 16/11/2020 |
| 19. | Vlinder Doll - Dress up Games , Avatar Creator | Kasuaali | 1,000,000+ | 4.7 | 39,304 | 13/11/2020 | 31 Dress up Games | 16/11/2020 |
| 20. | High School Dress Up For Girls | Kasuaali | 5,000,000+ | 4.1 | 32,343 | 06/11/2020 | Teenage Fashion Dress Up | 16/11/2020 |
| 21. | DRESS UP STAR: Design Girls, Boys, Friends, Home | Kasuaali | 100,000+ | 3.9 | 3,404 | 06/12/2017 | Best Girls Dress Up Makeup and Nail Manicure Game | 16/11/2020 |
| 22. | Superstar Career - Dress Up Rising Stars | Kasuaali, Luovuus | 10,000,000+ | 4.0 | 43,485 | 27/10/2020 | Fashion Games for Girls | 16/11/2020 |
| 23. | Prom Night Dress Up | Kasuaali, Luovuus | 5,000,000+ | 4.0 | 28,106 | 29/10/2020 | Fashion Games for Girls | 16/11/2020 |
| 24. | My Dress Up Diary | Kasuaali | 100,000+ | 4.0 | 1,718 | 18/10/2020 | PipeDream | 16/11/2020 |
| 25. | Fashion Show Dress Up Game | Kasuaali, Luovuus | 1,000,000+ | 4.0 | 16,371 | 09/11/2020 | Fashion Games for Girls | 16/11/2020 |
| 26. | MYIDOL (#Dress up #BoyGroup #k-star #k-pop) | Kasuaali | 1,000,000+ | 4.3 | 19,955 | 24/10/2020 | TinyCell | 16/11/2020 |
| 27. | Princess Dress up Games - Princess Fashion Salon | Kasuaali | 10,000,000+ | 4.0 | 28,977 | 30/10/2020 | Joy Journey Girls | 16/11/2020 |
| 28. | Fashion Superstar Dress Up | Simulaatio | 1,000,000+ | 3.8 | 26,776 | 27/08/2019 | Appstylist | 16/11/2020 |
| 29. | ♡ Vacation Summer Dress Up ♡ | Kasuaali, Luovuus | 500,000+ | 4.2 | 5110 | 02/11/2020 | Best Dress Up Games For Girls | 16/11/2020 |
| 30. | Top Model - Dress Up and Makeup | Viihde | 5,000,000+ | 4.2 | 50,234 | 23/11/2018 | Peachy Games | 16/11/2020 |
| 31. | Office Dress Up | Kasuaali, Luovuus | 1,000,000+ | 4.0 | 12,809 | 28/10/2020 | Fashion Games for Girls | 16/11/2020 |
| 32. | Girls Dress Up | Roolipelit, Luovuus | 100,000+ | 4.4 | 876 | 30/01/2020 | Fashion Games For Girls | 16/11/2020 |
| 33. | High School Couple: Girl & Boy Makeover | Kasuaali, Luovuus | 5,000,000+ | 4.0 | 26,064 | 06/11/2020 | Teenage Fashion Dress Up | 16/11/2020 |
| 34. | Fashion Cup - Dress up & Duel | Kasuaali | 1,000,000+ | 4.4 | 154,127 | 07/09/2020 | GAMEGOS | 16/11/2020 |
| 35. | Millionaire Wedding - Lucky Bride Dress Up | Kasuaali | 5,000,000+ | 4.0 | 17,004 | 29/10/2020 | Best Dress Up Games For Girls | 16/11/2020 |
| 36. | Actress Dress Up - Fashion Celebrity | Kasuaali, Luovuus | 5,000,000+ | 4.1 | 17,708 | 27/10/2020 | Fashion Games for Girls | 16/11/2020 |
| 37. | Icy Dress Up - Girls Games | Kasuaali, Luovuus | 500,000+ | 4.2 | 2,419 | 12/11/2020 | Best Dress Up Games For Girls | 16/11/2020 |
| 38. | College Girls Dress Up | Kasuaali, Simulaatio | 100,000+ | 3.9 | 1490 | 17/09/2020 | Teenage Fashion | 16/11/2020 |
| 39. | Fitness Girls Dress Up | Kasuaali, Luovuus | 100,000+ | 3.6 | 1,763 | 11/11/2020 | Best Dress Up Games For Girls | 16/11/2020 |
| 40. | Top Model Dress Up - Fashion Salon | Kasuaali, Luovuus | 1,000,000+ | 4.0 | 18,245 | 29/10/2020 | Fashion Games for Girls | 16/11/2020 |
| 41. | Vlinder Life : Dressup Avatar & Fashion Doll | Kasuaali | 1,000,000+ | 4.5 | 119,532 | 16/10/2020 | 31 Dress up Games | 16/11/2020 |
| 42. | ♡ Travel Dress Up Games ♡ | Kasuaali | 1,000,000+ | 3.8 | 32,907 | 02/04/2020 | Sevelina | 16/11/2020 |
| 43. | Royal Dress Up - Queen Fashion Salon | Kasuaali, Luovuus | 1,000,000+ | 4.0 | 10,654 | 28/10/2020 | Best Dress Up Games For Girls | 16/11/2020 |
| 44. | Girls Dress Up | Simulaatio | 100,000+ | 4.1 | 557 | 11/06/2020 | 7 Play | 16/11/2020 |
| 45. | Chinese Traditional Fashion - Makeup & Dress up | Opetus, Luovuus | 100,000+ | 4.0 | 768 | 30/07/2020 | Jas Development | 16/11/2020 |
| 46. | Princess Pretty Girl : dress up game | Kasuaali | 500,000+ | 4.1 | 4,868 | 12/07/2019 | FirstFox Games | 16/11/2020 |
| 47. | Alternative Fashion Dress Up | Kasuaali | 100,000+ | 3.6 | 792 | 14/11/2018 | Rogue + Wolf | 16/11/2020 |
| 48. | Princess of Thrones Dress up | Kasuaali | 100,000+ | 4.2 | 1,971 | 26/09/2018 | Game Gamer | 16/11/2020 |
| 49. | Couple Dress Up Games - First Crush | Kasuaali | 100,000+ | 4.5 | 479 | 24/10/2019 | Webelinx Love Story Games | 16/11/2020 |
| 50. | Gothic Dress Up | Kasuaali, Luovuus | 5,000,000+ | 4.1 | 23,075 | 29/10/2020 | Best Dress Up Games For Girls | 16/11/2020 |

To quickly analyse some qualities of the chosen games, I imported the table to SPSS Statistics 25. I was interested in the frequencies of the different genres, so I created a frequency table for the Genre variable. Although dress-up games most definitely are in a genre of their own, the Google Play Store only offers a small array of genres for the game developers to choose from [11]. Therefore, it is interesting to see if there is an outlying genre that jumps out.

*Table 2: Frequency table created in SPSS for the Genre-column.*

**Genre**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Kasuaali | 18 | 36.0 | 36.0 | 36.0 |
| | Kasuaali, Luovuus | 19 | 38.0 | 38.0 | 74.0 |
| | Kasuaali, Simulaatio | 1 | 2.0 | 2.0 | 76.0 |
| | Opetus, Luovuus | 1 | 2.0 | 2.0 | 78.0 |
| | Personointi | 1 | 2.0 | 2.0 | 80.0 |
| | Roolipelit | 4 | 8.0 | 8.0 | 88.0 |
| | Roolipelit, Luovuus | 1 | 2.0 | 2.0 | 90.0 |
| | Simulaatio | 4 | 8.0 | 8.0 | 98.0 |
| | Viihde | 1 | 2.0 | 2.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |

As can be seen from Table 2, the genre Kasuaali (Casual) appears the most, especially when paired with Luovuus (Creativity). 76% of the games have been tagged with this genre. Although those genres do not necessarily define dress-up games, they fit them well. Choosing the appearance of a character is a creative activity, and based on Julia Ahjovaara's analysis on the same data [12] users tend to play dress-up games for short amounts of time, which makes them casual in nature.

I did similar tables for other variables as well. I found that although the requirement for the games was to have at least 100,000 downloads, 68% of them had at least 1,000,000 downloads at the time. Regarding the ratings for the games, 88% had a rating of at least 4/5 stars. Both of these notions are not surprising considering that the Google Play Store aims to show games of high quality first [13]. In other words, the games that were chosen are generally popular and well-liked, which

makes them good candidates for finding out what qualities the popular dress-up games of today have.

To decide what parts of the games to analyse, I first tested the 20 first games on the Table 1 list. While playing the games I created notes on relevant features of the games. Based on these notes I created questions that would be answered for each game. As this thesis centers around user interfaces, the questions are solely about them. The questions are as follows:

1. Does the game have any sounds? (Background music or sound effects)
2. Is the game accessible for color blind people or for deaf people?
3. Is the color scheme of the user interface pink or lila?
4. Have the clothes been categorised in the user interface?
5. Do the buttons use text, symbols or both?
6. Is the user interface reactive? (That is, do the user interface elements give clear feedback to user action?)

As said before, the questions are a result of testing some of the games beforehand and paying attention to what kind of qualities they have. The first question was chosen because many of the games had sounds, some even had voiced characters. Some of the games on the other hand had no sounds at all. It will be interesting to know what the ratio of having sounds or not having sounds really is.

As accessibility of games is an important topic, I wanted to find out how accessible dress-up games in general are and format a question for it. As for the third question, many of the tested games had a pink or lila color scheme. It was common enough that it could almost be called a defining quality of dress-up games.

The fourth question is a result of knowing the drag-and-drop history of dress-up games (see Chapter 2), and also noting that all of the games tested at this point had a categorised user interface. If there exists a game without clothing categories, it would be interesting to see what kind of user interface would be implemented in its place.

The fifth question was chosen because the user interfaces of dress-up games usually consist of a lot of buttons, so it makes a big difference visually what kind of buttons they have. The sixth question is really just to find out how common it is for the developers to have put effort into the user interface, as some of the tested games had complex

animations for user input and some had no reactiveness at all apart from the clothes changing.

Note that these questions are meant only for the view where the player is dressing up or otherwise visually modifying a character. Some of the games had mini games, narrative storylines and other parts that have not been taken into consideration in the analysis.

During the analysis some other notions are kept in mind as well. User interfaces consist of user interface elements, so the elements are an important part of them. The ones that seem to be common in dress-up games are therefore presented. The layouts of the user interfaces are also important, so the analysis includes looking for common patterns in the user interface styles.

## 3.2 Results

As the analysis is done from multiple viewpoints, the results are divided into three subchapters. The first section introduces the common user interface elements that are noted to be in many of the tested games. The second section introduces the patterns that are found in the user interface layouts. Finally, the third section gives results to the questions that were presented before.

### 3.2.1 User Interface Elements in Mobile Dress-up Games

This section aims to briefly introduce to the reader the user interface elements that are commonly found in dress-up games. In dress-up games, buttons are the most important and prevalent element, unless the game uses a drag-and-drop -implementation. Different elements can be utilized to arrange the buttons.

Grid view, shown in Figure 9, means a scrollable grid consisting of rows and columns [14]. It is useful for showing multiple images at once. As dress-up games usually have dozens or sometime even hundreds of clothing options for the user to choose from, grid view is often used to show the options.

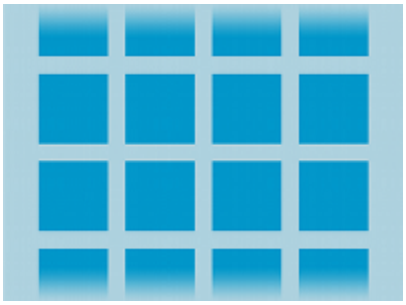

*Figure 9: A directional picture of the grid view [12].*

Carousels are utilized in many user interface elements. Carousel means a vertically scrollable container that contains instances of similar kind of content [15]. In dress-up games, the most prevalent form of carousels are button carousels. Button carousels are simply a carousel of buttons. They are often used for displaying category buttons and sometimes clothing buttons as well. Figure 10 shows an example of a button carousel with category buttons as content.

Tap-to-reveal controls can be used to hide buttons and bring them back up again. Tapping on the screen brings up the buttons, and tapping white space again hides them [15]. This is sometimes useful in dress-up games when the player wants to take a screenshot of the doll without the user interface elements cluttering up the screen.

Some games with a large collection of clothes also provide a search function. Sometimes the user can just search by typing keywords, and sometimes the game also offers a sorting and/or filtering options. Sorting means that the user can choose to sort the clothes in a certain order, and filtering means that the user can choose to see only certain kinds of content [15].

### 3.2.2 Patterns in the User Interface Layouts

After going through all of the 50 games of the test group, there are some general notions about the dress-up games' user interfaces as a whole. Some of the games have highly similar interfaces, while some of them have more unique implementations. There are a few patterns that can be noticed. To reiterate, only the dress-up views of the games where the character's appearance is modified were analysed and the other parts of the games were ignored.

A similar style of layout that was introduced in the Chapter 2 is used in many of these applications as well. That layout is used in *picrew.me* -games, as Figure 7 shows. Games that use a user interface similar to this are *Pastel Girl: Dress Up Game* and *Anime Dress Up: Cute Anime Girls Maker* among others. I like to call this kind of user interface the "top-down-split" -interface, because the doll and the category drawer are separated into their own boxes vertically.

In Figure 10 is a screenshot showing a top-down-split -interface. If compared with Figure 7, many similarities can be noticed. The doll is on the upper part of the screen, and the user interface is on the bottom part apart from some small buttons being on the top part. The category buttons are in a button carousel, and when a category is chosen, the buttons for different appearance choices appear underneath it in a scrollable grid view.

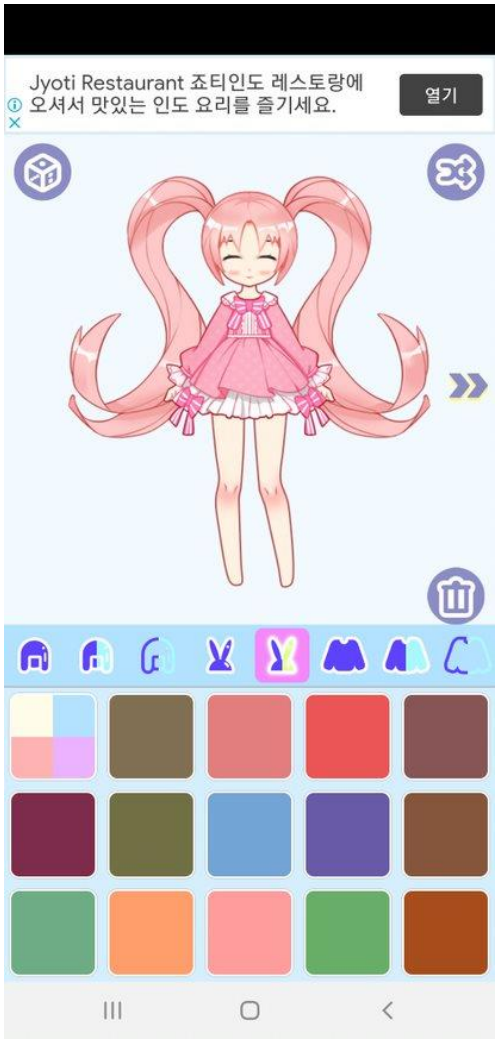


*Figure 10: Screenshot from the game* Anime Dress Up: Cute Anime Girls Maker.

Another pattern is what I like to call the "side-scroller" interface. It appeared in numerous games, however what I did not realise while compiling the list of games to test out, was that many of these games seem to be made by the same developer. If the developers are not the same, their games at least follow the exact same design. To understand the similarities, Figure 11 shows a screenshot from two games made by these developers.

These games were developed under different developer names on the Google Play Store, like *Teenage Fashion Dress Up* and *Fashion Games For Girls,* which is why I did not notice this. Having many of the games being done by the same developer might skew the results a bit, but in the end these games are still a huge part of the market. Since they are

so popular, they still give an accurate representation of what kind of dress-up games people like to play on mobile nowadays.


*Figure 11: Screenshots from the games* Dress Up Games Free *(left) and* Anime Dress Up – Games For Girls *(right).*

The name “side-scroller” comes from two vertical button carousels being placed on the sides of the screen. Usually, the category buttons can be seen on the left and the appearance choice buttons are on the right. Compared to the top-down-split interface, where the character is given a lot of space and most of the user interface is in a separate box, here they are very close to the character. There are also usually not as many options present at the same time, so the user has to scroll more.

There are some similarities between these two patterns. Notice how both in Figure 10 and Figure 11 there are buttons separated from the category buttons and choice buttons. These buttons represent additional actions that are not part of the main process of choosing the clothes. What the buttons do depends on the game, but the common buttons are as follows: taking a picture of the doll and saving it into the user's phone, randomizing the appearance of the doll, removing all the choices the user has made for the doll's appearance and resetting it to its original look, going back to a menu screen if one exists.

There are some more unique layouts as well that do not fit into any particular patterns. For example, *Top Model - Dress Up and Makeup* (Figure 12) stands out from the list with its user interface.


*Figure 12: Screenshot from the game* Top Model - Dress Up and Makeup.

When putting makeup on the doll, a pink table is shown, and the category buttons have been made into the shapes of different tools. The tools have been laid on the table, and the user has to scroll left and right to navigate. Although this looks very unique, at its core, it is just a simple content carousel. There is even a little bar of dots right on the bottom of the screen that shows what part of the carousel the user currently is at, which carousels typically have. What makes this different though, is that a user can grab some of the tools like lipstick, drag it on the doll's lips and color the lips as if they were using a colored pencil. In other words, the user does not simply tap on a button to change the doll's appearance, and instead they paint the makeup on by dragging the tools around. This feature makes the game a bit more interactive.

Going into a completely different direction, *Princess Pretty Girl: dress up game* (Figure 13) has a distinctive user interface as well. The game has two features that are not very common in dress-up games: the game can only be played horizontally, and it has no scrolling at all. Most of the dress-up games used in this research had only vertical views, so the games with horizontal views stand out.

Most of the visible menus and choices in *Princess Pretty Girl: dress up game* are crammed into the same view. One of the best practices in designing user interfaces is to reduce visual clutter, which in dress-up games is often achieved by scrollable elements like content carousels. It is obvious that this guideline was not taken into account when designing this game's user interface, but from a user's perspective, the game is still playable and enjoyable, although slightly confusing at first.

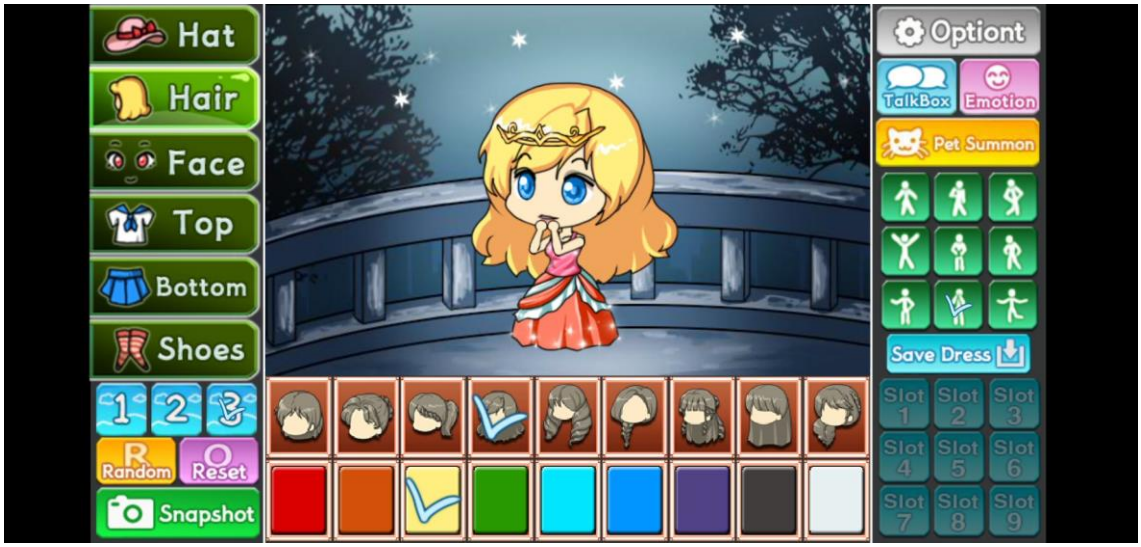


*Figure 13: Screenshot from the game* Princess Pretty Girl: dress up game.

Many of the other dress-up games on the list have unique implementations as well, but the ones mentioned are the most unique. In general, all of the games utilize button elements, so none of them have wildly distinct layouts.

### 3.2.3 Questions Results

To analyse the interfaces in more detail, each game was analysed with the previously shown (section 3.1) questions in mind. The results have been compiled into Table 3.

*Table 3: A compiled list of the results. The title of each game is written as it is shown on the Google Play Store, and they can be seen on the leftmost column of the table. Rest of the columns represent the questions. The explanations for the questions are marked with the *-symbol, and they are as follows:*

**Does the game have sounds? (BM=Background music, SE=Sound effects)*

*** Is the game accessible? (B=For color blind people, D=For deaf people)*

**** Is the game's color scheme pink or lila? (Yes/no)*

***** Have the clothes been categorised into the user interface? (Yes/no)*

****** Do the user interface buttons contain text, symbols or both? (T=Text, S=Symbols)*

******* Do the user interface elements give clear feedback to user action? (Yes/no)*

| Game Title | 1* | 2** | 3*** | 4**** | 5***** | 6****** |
|---|---|---|---|---|---|---|
| **Dress up! Time princess** | BM/SE | D/B | Yes | Yes | S | Yes |
| **Dress Up Games Free** | No | D/B | Yes | Yes | S | Yes |
| **Super Stylist - Dress Up & Style Fashion Guru** | BM/SE | D/B | No | Yes | S/T | Yes |
| **College Student Girl Dress Up** | No | D/B | No | Yes | S | Yes |
| **Pastel Girl : Dress Up Game** | BM/SE | D/B | Yes | Yes | S | Yes |
| **Covet Fashion - Dress Up Game** | No | D/B | No | Yes | S/T | Yes |
| **Love Nikki-Dress UP Queen** | SE | D/B | No | Yes | S/T | Yes |
| **Anime Dress Up - Games For Girls** | No | D/B | Yes | Yes | S | Yes |
| **Dress up - Games for Girls** | No | D | Yes | Yes | S | Yes |
| **Anime Dress Up: Cute Anime Girls Maker** | BM/SE | D/B | Yes | Yes | S | Yes |

*Table 3: A compiled list of the results (continued).*

| Game Title | 1* | 2** | 3*** | 4**** | 5***** | 6****** |
|---|---|---|---|---|---|---|
| **Red Carpet Dress Up Girls Game** | No | D/B | Yes | Yes | S | Yes |
| **Girl Squad Fashion - BFF Fashionista Dress Up** | BM | D | Yes | Yes | S | Yes |
| **Girls Dress Up** | BM | D/B | Yes | Yes | S | Yes |
| **Momo's Dressup** | No | D/B | Yes | Yes | S | Yes |
| **Dress Up Games Stylist - Fashion Diva Style** | BM | D/B | Yes | Yes | S/T | Yes |
| **Princess dress up and makeover games** | BM/SE | D/B | Yes | Yes | S | Yes |
| **Magic Dress Up** | BM | D/B | Yes | Yes | S | Yes |
| **College Girls Team Makeover** | BM | D | No | Yes | S | Yes |
| **Vlinder Doll - Dress up Games , Avatar Creator** | BM | D/B | Yes | Yes | S | Yes |
| **High School Dress Up For Girls** | No | D | Yes | Yes | S | Yes |

*Table 3: A compiled list of the results (continued).*

| Game Title | 1* | 2** | 3*** | 4**** | 5***** | 6****** |
|---|---|---|---|---|---|---|
| **DRESS UP STAR: Design Girls, Boys, Friends, Home!** | BM/SE | D/B | Yes | Yes | S | No |
| **Superstar Career - Dress Up Rising Stars** | No | D | Yes | Yes | S | Yes |
| **Prom Night Dress Up** | No | D | Yes | Yes | S | Yes |
| **My Dress Up Diary** | BM | D/B | No | Yes | S | Yes |
| **Fashion Show Dress Up Game** | No | D | Yes | Yes | S | Yes |
| **MYIDOL (#Dress up #BoyGroup #k-star #k-pop)** | BM/SE | D/B | No | Yes | S | Yes |
| **Princess Dress up Games - Princess Fashion Salon** | BM/SE | D/B | Yes | Yes | S | Yes |
| **Fashion Superstar Dress Up** | No | D/B | No | Yes | S | No |
| **💔 Vacation Summer Dress Up 💔** | No | D | No | Yes | S | Yes |
| **Top Model - Dress Up and Makeup** | BM/SE | D/B | Yes | Yes/No | S | No |

*Table 3: A compiled list of the results (continued).*

| Game Title | 1* | 2** | 3*** | 4**** | 5***** | 6****** |
|---|---|---|---|---|---|---|
| **Office Dress Up** | No | D/B | No | Yes | S | Yes |
| **Girls Dress Up** | BM | D/B | Yes | Yes | S | No |
| **High School Couple: Girl & Boy Makeover** | No | D/B | Yes | Yes | S | Yes |
| **Fashion Cup - Dress up & Duel** | BM | D/B | No | Yes | S | Yes |
| **Millionaire Wedding - Lucky Bride Dress Up** | No | D/B | Yes | Yes | S | Yes |
| **Actress Dress Up - Fashion Celebrity** | No | D | No | Yes | S | Yes |
| **Icy Dress Up - Girls Games** | BM | D | Yes | Yes | S | Yes |
| **College Girls Dress Up** | No | D | Yes | Yes | S | Yes |
| **Fitness Girls Dress Up** | No | D/B | Yes | Yes | S | No |
| **Top Model Dress Up - Fashion Salon** | No | D/B | Yes | Yes | S | Yes |

*Table 3: A compiled list of the results (continued).*

| Game Title | 1* | 2** | 3*** | 4**** | 5***** | 6****** |
|---|---|---|---|---|---|---|
| **Vlinder Life : Dressup Avatar & Fashion Doll** | BM | D/B | Yes | Yes | S | Yes |
| **💔 Travel Dress Up Games 💔** | BM | D/B | No | Yes | S | Yes |
| **Royal Dress Up - Queen Fashion Salon** | No | D | Yes | Yes | S | Yes |
| **Girls Dress Up** | BM | D/B | Yes | Yes | S | No |
| **Chinese Traditional Fashion - Makeup & Dress up** | No | D | No | Yes | S | Yes |
| **Princess Pretty Girl : dress up game** | BM/SE | D/B | No | Yes | S/T | Yes |
| **Alternative Fashion Dress Up** | BM/SE | D/B | No | Yes | S/T | Yes |
| **Princess of Thrones Dress up** | BM/SE | D/B | Yes | No | S | Yes |
| **Couple Dress Up Games - First Crush** | BM/SE | D | Yes | Yes | S | No |
| **Gothic Dress Up** | BM | D/B | No | Yes | S | Yes |

Next I will present an analysis of the results. For this, I created frequency tables for each question in SPSS for easier viewing of the results.

*Table 4: Frequency table for the column 1* of Table 3.*

**1***

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | BM | 14 | 28.0 | 28.0 | 28.0 |
| | BM/SE | 13 | 26.0 | 26.0 | 54.0 |
| | No | 22 | 44.0 | 44.0 | 98.0 |
| | SE | 1 | 2.0 | 2.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |

Table 4 shows the results to the question "Does the game have sounds?". The table shows that 44% of the games have no background music or sound effects at all, making it is the most frequent result. In the world of mobile gaming where the sounds are often turned off if the player is in a public place, the lack of them is no surprise. Dress-up games also do not really need sounds, because the games usually rely on visual cues. Sounds just help to make the game seem more polished and possibly add some fun flavour to it. For example, the game *Top Model - Dress Up and Makeup* uses sounds a lot. It has background music, the character speaks at times and the user interface elements have sounds when interacted with. Still, the game can easily be played with the sounds turned off. Background music and sound effects are not crucial for understanding how the game works, and all the character says is just one-liners like "It's so fun" and "Confidence is a secret to becoming a supermodel".

As for the games that did have sounds, all but one of them had background music. This makes sense, as it can be odd for the player to play a game with sometimes occurring sound effects without having continuous sounds like music. The game with only sound effects was *Love Nikki – Dress Up Queen*. In the game's dress-up view, the sound effects are minimal. One can only hear them when tapping on certain buttons, but not all buttons have sound effects, so the sound effects that are there do not really add anything to the experience and so the game could just as well be played with the sounds turned off.

It is possible that the potential of using sounds is underused in dress-up games. Generally, dress-up games only have three types of sounds at most: interactive sounds like when a button is pressed, background music and some spoken lines from the character. No other sounds

could be heard in the games tested for this study. Sounds can make the game feel more alive, and this could be utilized in dress-up games to make the player feel more immersed in the game.

For example, the characters in dress-up games are often placed against a background. Sometimes the player can even change this background. The backgrounds could emit ambient noise, like if the background is a forest the player could hear birdsong, or if the background is a beach, sounds of water and sea gulls could be heard.

But to reiterate, players often play mobile games without sounds, so it is understandable that developers do not want to put too many resources into them.

The second question "Is the game accessible?" explores whether deafness and color blindness was taken into account when the games' user interfaces were developed. The results are compiled into Table 5.

*Table 5: Frequency table for the column 2** of Table 3.*

**2****

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | D | 14 | 28.0 | 28.0 | 28.0 |
| | D/B | 36 | 72.0 | 72.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |

Given the notions about dress-up games' sounds, it is not surprising that dress-up games in general are accessible for deaf people. All of the test group's games could easily be played without any sounds. In some games the player might miss out on some dialogue, but the dialogue is never an important part of the gameplay.

It is to be mentioned that some of the games have story elements that are voice-acted. I did not include these voice-acted scenes into this research but given that these story elements are a big part of some of the games, it is important to mention them. The voice-acted scenes contain texts for the dialogue, so they are suitable for deaf people as well.

As for the second part of the question that has to do with color blindness, it was a hard topic to analyse. Color is a very important part of dress-up games because the player can often choose to change the color of the doll's hair, eyes or even the color of the clothes. Because of this, people with severe color blindness already cannot enjoy the games to their fullest.

As Table 5 shows, about one third of the games had user interface elements that could potentially be a problem for a color blind person. The number is concerning especially because dress-up games are a visual genre. The most common problem occurs in the buttons that have a picture preview of the appearance option (such as clothing or hair style) that the button changes. If the picture conflicts with the button's background color, a color blind person may not be able to tell what the picture represents, especially if the game is drawn in a simplistic style. More realistic styles are easier to differentiate, since shadows and details help to bring out the shape of the clothing.

To fix the conflict between colors, the picture previews can be modified by giving an outline to them. An example of this can be seen in Figure 14, where the clothes have a clear black outline.


*Figure 14: Screenshot from the game* Vlinder Life : Dressup Avatar & Fashion Doll*.*

The games that did not have outlines or realistic enough styles were not given the “B” rating. Some of the games also had a small user interface that made it harder already to differentiate between the pictures, so if the game had even minor problems that could make it difficult for a color blind person to play the game, that tipped them over the edge to not receive a “B” rating. An example of a game like this can be seen in Figure 15.


*Figure 15: Screenshot from the game* Girl Squad Fashion - BFF Fashionista Dress Up.

It is to be noted that because there was no color blind person to test these games, and there exists many variates of color blindness [16], the results are not definitive.

*Table 6: Frequency table for the column 3*** of Table 3.*

**3*****

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 17 | 34.0 | 34.0 | 34.0 |
| | Yes | 33 | 66.0 | 66.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |

The question for the third column was if the game's color scheme is pink or lila, and the frequency table of the results can be seen in Table 6. In order for the game to be categorised as the "Yes" option, their user interface elements had to be predominantly colored in either pink or lila. How lila and pink are defined as colors depends on the person, but Figure 16 shows how they were defined in this study. If the colors fit within the given color palette, they were accepted as pink or lila.

*Figure 16: The color palette that was used to recognize the colors pink and lila in this research. The luminosity and saturation of the colors may have differed. The gradient was created with Adobe Photoshop CS6.*

The results show that 66% of the games have a color scheme that fits the criteria. That is two thirds of the games, which shows that this type of color scheme is very common in dress-up games. It is not a defining criterion, but it is a recognizable quality.

It also has to be noted that some of the games that do not have pink or lila color scheme have a certain theme to the game. A different color palette is used to accentuate this theme. For example, a couple of the games have a gothic theme, so their user interfaces have a darker color palette with lots of black in them to fit the mood the developers are trying to portray.

In western culture, girls are traditionally raised to like the color pink [17]. Since girls stereotypically prefer this color, it is one of the indicators that dress-up games are made for girls. Perhaps developers use this color scheme to make their game more attractive to young girls.

*Table 7: Frequency table for the column 4**** of Table 3.*

**4****

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 1 | 2.0 | 2.0 | 2.0 |
| | Yes | 48 | 96.0 | 96.0 | 98.0 |
| | Yes/No | 1 | 2.0 | 2.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |

The fourth column gives results to the question "Have the clothes been categorised into the UI?". The results are again compiled to a frequency table in Table 7.

All of the games except two had clearly categorised user interfaces. Although categorising the clothes is popular nowadays and a basic feature of dress-up games, I was still excepting to see more remnants from the drag-and-drop -period of dress-up games (see Chapter 2). Of course, given the small space of mobile screens, a drag-and-drop -style user interface is harder to implement than on a desktop computer.

The game that got put into the "Yes/No" category is the *Top Model - Dress Up and Makeup* that is seen in Figure 12. Basically the result is that some parts of the game are categorised, and some are not. The game has different views for different purposes: the first view is for washing the character's face, second view is for putting on makeup and accessories and the third view is for putting clothes on the character. The first two views are clearly not categorised, as the different tools are in a button carousel. The third view however has the clothes categorised like in the other games. Therefore, if one is strictly talking about putting clothes on a character and not the other parts of the game, this game had clear categorisation as well.

The one game that had clearly no categorisation at all is the *Princess of Thrones Dress up.* The layout of the user interface is still reminiscent of categorised user interfaces. Firstly, not all the clothes are visible, and the player has to tap the red arrows to see more clothes, as visualised in Figure 17. This action is similar to the user interfaces that have categorisation. However, Figure 17 also shows what happens when the arrow is tapped: more clothes of the same type, but different style are

shown. All of the clothes have been put into this same wardrobe and can be viewed with the same action of tapping the red arrow. This means that the clothes are not categorised.


*Figure 17: Two screenshots from the game* Princess of Thrones Dress up*. The bottom picture shows what happens when the red arrow to the right of the wardrobe in the top picture is tapped.*

Although the game stands out for not having categorisation, the implementation of the user interface is still nothing new, as it is almost the same as in the games with categorised user interfaces.

*Table 8: Frequency table for the column 5***** of Table 3.*

**5*****

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | S | 44 | 88.0 | 88.0 | 88.0 |
| | S/T | 6 | 12.0 | 12.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |

The question five was whether the user interface buttons contain text, symbols or both of them. The results are compiled to Table 8.

88% of the games used only symbols, 12% used both symbols and text, and total 0% used only text. Symbols clearly nominated. It makes sense for multiple reasons:

1. Using symbols instead text saves space, which is needed for the small mobile screens.
2. Some of the target audience might be too young to read, and symbols help them understand the game better.
3. In game design, intuitiveness is often favoured over explanation, and symbols are more intuitive than text.
4. Dress-up games are mainly visual games, so it is easy to find symbolic representations for the buttons.

It also needs to be noted that if the buttons mostly had symbols and only a couple of them had text, and the text took equal amount of space as the symbols, the game was marked as just having symbols. Figure 17 is an example of this, the game it represents is marked to have only symbols, but it does have one button with text in it. The button reads “More games”, which is often written down in other games as well instead of having a symbol represent it. As the text does not take any more space than the other buttons, it is only in one button, and the “More games” -button is widely used in other games that mainly use symbols as well, it does not make sense to mark the game as having buttons containing text.

Most of the games marked as “S/T” had more symbols than text. In many cases, the buttons for choosing clothing categories had both the name of the category in text and also a picture representing the

category embedded into the button. The buttons for selecting clothing options had just a picture of the clothing, no text.

*Table 9: Frequency table for the column 6****** of Table 3.*

**6******

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | No | 6 | 12.0 | 12.0 | 12.0 |
| | Yes | 43 | 86.0 | 86.0 | 98.0 |
| | Yes/No | 1 | 2.0 | 2.0 | 100.0 |
| | Total | 50 | 100.0 | 100.0 | |

The sixth question is "Do the user interface elements give clear feedback to user action?". The results are in Table 9.

86% of the games give good, clear feedback to user actions. Apart from the obvious action of the doll's appearance changing, the user interfaces usually give feedback as well, such as the button becoming a different color when tapped on.

When it comes to the 12% of the games that fell into the "No" - category, the lack of feedback was generally not a huge issue, but still something that should be fixed to make the user experience better. In *DRESS UP STAR: Design Girls, Boys, Friends, Home!* when the user chooses an option, like an eye color, the change can immediately be seen on the doll's face, but the user interface does not tell the user that an option has been chosen. This can be seen in Figure 18, which shows a screenshot of this instance.

*Figure 18: Screenshot from the game* DRESS UP STAR: Design Girls, Boys, Friends, Home!.

Although the game does give feedback in the way that the doll's face changes, it is not enough, because colors can appear different to human eye against different backgrounds. It may not be clear for the user which one of the options has been chosen, especially if they are color blind. In Figure 18, it may not be obvious for the user which one of the more gray eye color options has been chosen.

For the game *Top Model - Dress Up and Makeup,* it was harder to give a definite answer, which is why it is categorised as "Yes/No". The game generally gives good feedback, but there is one instance where it is not clear for the user what is happening when they tap on a button. An example of this instance can be seen in Figure 12. In the screenshot, the blush-category has been chosen and the options for the different colors are displayed on the right in the shape of stars. One of these colors has been tapped on, but the user interface does not give any indications that a color has been chosen. In addition to that, the blush does not appear on the doll, and instead the user has to drag the blush cushion onto the doll's cheeks for the color to be seen. The game does not give any visual cues or other explanations to the user that they have to drag it themselves. Because of this, when the user chooses one of the colors, nothing happens. The same thing happened with a few of the other makeup tools.

These examples are a reminder that giving feedback to user's actions is important. Although none of the games used as an example were

unplayable due to the lack of feedback, it still causes unneeded confusion that could easily be avoided. This confusion disrupts the user experience, even in games that are otherwise very polished such as *Top Model - Dress Up and Makeup.*

# 4 User Experience Study of Different User Interface Styles

Together with Julia Ahjovaara we created a simple dress-up game for research purposes. Both of our research focuses on dress-up games, but from different viewpoints. While this thesis centers solely on their user interfaces, Ahjovaara's thesis [12] has a wider, cultural angle. It aims to find out what they essentially are and what components they are made of, and also what kind of experiences dress-up games offer and what people get out of playing them.

The game does not have an official name, but on the Google Play Store it is called *Cute Fashion Stylist Dress-up Game*. It has three user interfaces to see how different user interfaces affect the user experience. To conduct the research, we created a questionnaire which a test group could complete after playing the game. To get the testers, we advertised the game on various platforms.

The following sections will introduce the game and the user interfaces more closely. The results from the questionnaire are also presented. The results show how the user interfaces compare to each other, and also what qualities the testers like and do not like.

## 4.1 Core Mechanics of the Game

The game was created based on existing dress-up games. We found and tested multiple dress-up games that are available on the Google Play Store. After playing the games, we wrote down common qualities the games had. We found that every game had at least two things: at least one modifiable character and a selection of different clothes. We also noted some other common qualities that were present in most, but not all games: the colors are bright, the character's makeup and

hairstyle can be changed in addition to the clothes, the game has mini games or challenges, the character is female and the game is drawn in 2D graphics.

Keeping these qualities in mind, the game is implemented with the following specifications:

1. The game has a main menu that contains buttons for choosing between the three different user interfaces, which have been implemented into their own scenes. This is the first scene of the game when it is started.
2. The game has nine different categories for modifying the character's appearance. The categories are as follows: skin color, eye color, hair style, tops, bottoms, dresses, outerwear, shoes and accessories. Every category has ten options to choose from and some of them have to be bought with in-game money in order to use them. The categories have been modified a bit for the third user interface.
3. The game contains in-game currency. The currency can be used to unlock new appearance options. The amount of money the player has at any time is displayed on the screen and the "$" -symbol is used to display the currency.
4. The game contains challenges. The challenges can be played to get more money. The challenges have been implemented into the user interface, and can be accessed by tapping on a specific button.
5. The game has a "reset" -button that removes all the clothes from the character.
6. The game has a "random" -button that randomizes the character's appearance.

There are five different challenges and some of them are made to be more difficult than others. At first the player can access only one challenge, and the other challenges can be unlocked by completing the previous ones. The player's performance on each try is rated on a four-tier system: 0 stars means failure and no money is awarded, 1 star means the player has passed the challenge and is awarded $10, 2 stars awards $20, and 3 stars awards $60. This means that how much money the player gets from the challenge depends on how well they do on it.

Figure 19 shows the challenges view. This view is the same in all of the three different user interfaces. As Figure 19 shows, the player is given a short description of the challenge. The description should give them

an idea of what kind of clothes they should put on the doll. The rating system has been implemented into the user interface, so the player can see themselves how well they did.

The rating is based on hidden tags. Every item has tags like “cute”, “formal” and “professional”. Different tags lower or add to the player’s score in each challenge. For example, for a challenge where the player should dress the doll for going to a job interview, they want to choose clothes that are tagged as “professional” and avoid clothes that are tagged as “sexy”.


*Figure 19: Screenshot from the game* Cute Fashion Stylist Dress-up Game *showing the “challenges” view.*

The game does not have any sounds. This decision is based on the research done in analysing the test game group, where 44% of the games did not have any background music or sound effects despite being rated high. This means that a dress-up game can have good user experience even if it does not have any sounds.

## 4.2 The User Interfaces

To decide what kind of user interfaces the game should have, we used our previous analysis of the selected group of 50 games. As was mentioned in section 3.2.2, two user interface layouts stood out in the game group: the top-down-split -interface and the side-scroller -interface. These user interface styles are clearly popular, so two of the user interfaces in our study are modelled after them. The third user interface is our own design, one that we did not see in any of the games that were tested.

The user interfaces also have their own color schemes. The other visual parts of the game, such as the clothes, have to fit each color scheme so that no user interface looks out of the place. Because of this, the color schemes could not be made to look too different.

The clothes have been categorised in each user interface, although User Interface 3 uses a different categorisation system from the other ones. The categories are implemented because the results from our previous research in analysing the test game group of 50 games point to them being almost necessary for dress-up games' user interface design.

All but one of the user interfaces also use symbols only. In the test game group analysis, all of them used symbols at least partially in the user interface elements. The category buttons in UI3 use text instead of symbols to test if the symbols really make the user experience better.

The following chapters focus on introducing the three different user interfaces we made for the game.

### 4.2.1 User Interface 1

The User Interface 1 (UI1) is designed based on the top-down-split user interface and Figure 20 shows how it looks in the game. As stated

previously in section 3.2.2, this style of user interface turned out to be very commonly used among the test game group. Therefore, we wanted to include it as one of the user interfaces to see if users actually like it.


*Figure 20: Screenshot of the User Interface 1 of our game* "Cute Fashion Stylist Dress-up Game".

As in the other games with a top-down-split interface, the categories and appearance options are in the bottom part of the screen. The other buttons are scattered around the doll, which is also similar to this style of user interfaces. The buttons on the upper left corner are for going to

the menu, resetting the doll's appearance and randomizing the doll's appearance. The button for accessing challenges is in the lower right corner, and the available amount of money the player currently has is shown in the upper right part of the screen.

The character has a lot of space around it, more than in the other user interfaces. This can be advantageous to the game designer, because they do not have to limit the clothes, hair and other options to fit the screen, so they have more freedom in designing them. It can also give an impression of having more white space, which looks better to the user's eye.

The button carousel that contains the buttons for different categories is horizontally scrollable, and the grid view containing the buttons for changing the doll's appearance is also horizontally scrollable. The grid view makes it possible to see many options at once, which is another advantage of this user interface. The clothes that are not available to the player and need to be bought have a pink star over them.

The color scheme in UI1 is pink. Research [17] shows that girls prefer the color pink, and dress-up games are generally made for girls. Our own previous research also shows that dress-up games' user interfaces often use the color pink. Therefore, we wanted to see if the testers would prefer this color scheme over the others.

### 4.2.2 User Interface 2

The User Interface 2 (UI2) is based on the side-scroller interface. This style of user interfaces also turned out to be popular in the previous research in section 3.2.2. This style, however, was used in a series of very similar games that seem to be made by the same developers under different names, as was established in section 3.2.2. But because so many popular games use this interface, one would assume that users like to use it, so it is included in our research to see what the testers think about it.

The UI2 is shown in Figure 21. The category buttons can be seen as a scrollable column on the left and the option buttons are in a scrollable column on the right. Compared to the UI1, where the character is given a lot of space and most of the user interface is in a separate box, here they are more scattered around the screen and very close to the character. In this version, the user can see the least amount of options

at once, so they have to scroll more than in the other versions. It will be interesting to see if the testers take a note of that, although the amount of clothing options the game has (ten for each category) is such a small amount that the difference might not be notable.

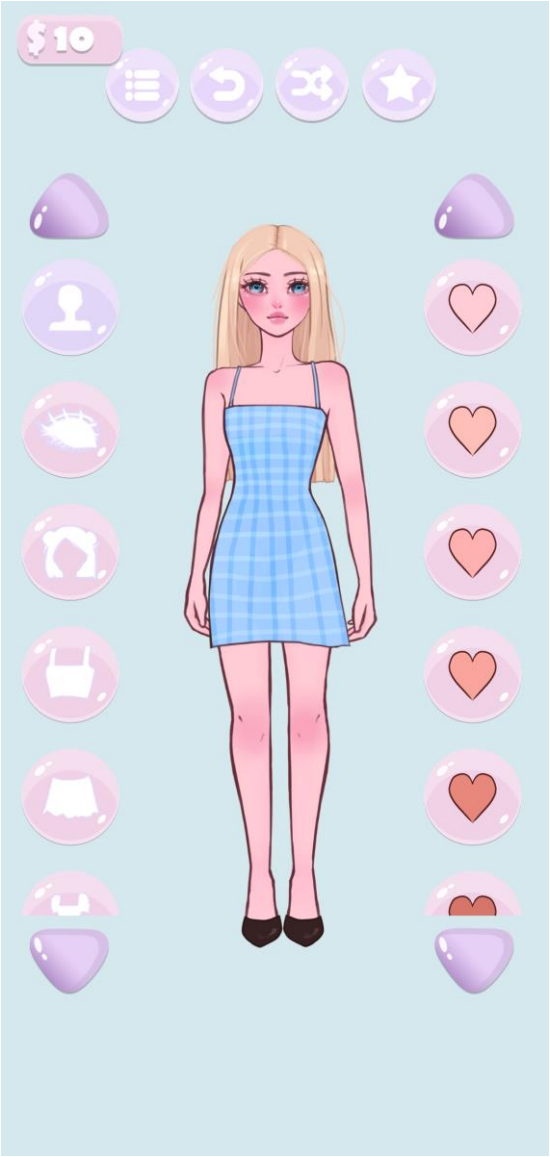


*Figure 21: Screenshot of the User Interface 2 of our game* Cute Fashion Stylist Dress-up Game.

All the other user interface elements are on the top part of the screen. The amount of money that the user has is visible there, and also the menu, reset, and randomize buttons are located there.

A benefit of the UI2 is that the buttons are big and have more space around them than in the other user interface versions. This can make

using the interface more comfortable especially on smaller screens. The user is less likely to accidentally tap on the wrong buttons, and it is easier to play by using one hand and a thumb. Although the category and option columns have arrows on the top and bottom of the columns, the user does not have to tap on them to scroll. They can simply swipe up and down, which also makes it easier to navigate using only one hand.

The color scheme of UI2 is bluish and lila. The colors themselves are not far from the colors that dress-up games usually have, but they are light pastel. This is to see if the testers prefer lighter colors.

### 4.2.3 User Interface 3

The User Interface 3 (UI3), shown in Figure 22, is my and Julia Ahjovaara's own design. We tried to create a design that does not resemble any of the user interfaces that the test game group has.

The main idea of this user interface is to go even deeper with the categorisation. There are five main categories: body, tops, bottoms, shoes and accessories. And then, in each main category, there are multiple subcategories. The main category can be changed by tapping on arrows, and the corresponding subcategories have their own buttons that are all visible at the same time. In Figure 22, "Body" is the main category that is chosen at the moment and "Skin", "Hair" and "Eyes" are the subcategories. Those subcategories are actually main categories in the other user interface versions, but completely new categories were also created for this user interface. For example, "Shoes" became a main category and its subcategories are "Boots", "Sneakers" and "Flats".

Creating more categories could be useful if a game has a lot of options for the player to choose from. This way the users do not become as easily overwhelmed by the options, and the user interface looks more put together as well. However, our game does not have many options, so UI3 may seem clunky to the testers. This might have an effect on the questionnaire results.

The category buttons also differ from the other user interfaces in that they use text to describe the content instead of symbols. This is to see how the users feel about text versus symbols.

What is also different in this user interface is that there is no scrolling at all. When the user chooses a subcategory, the user can see all of the options at the same time. This is the case in part because the game does not have a lot of options, so if the game did have more, scrolling would be needed. Also, instead of scrolling, the user has to tap more: they have to choose the main category, then the subcategory, and then the option that they want to put on the doll. It will be interesting to see if this comes up in the questionnaire results.

In this user interface, the buttons that are not for categories or changing the doll's appearance are again separated from the rest. The challenges, reset, randomize and menu buttons are all on the bottom part of the screen.

As for the color scheme, we wanted to use darker colors here. The colors are still lila and pink, which are common for dress-up games, but not a lot of dress-up games that were tested for this research had a darker color scheme. Usually if the colors were darker, the theme was dark as well, such as vampires or goths. Therefore, we wanted to see what the testers think of the darker colors as they are not that common.

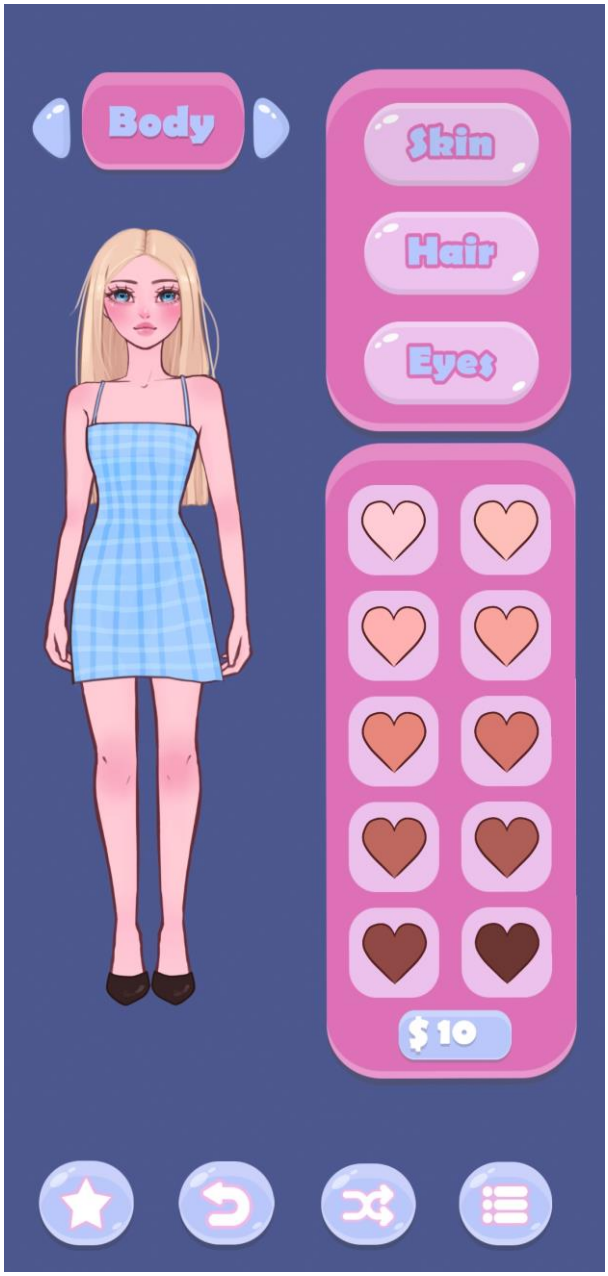


*Figure 22: Screenshot of the User Interface 3 of our game* Cute Fashion Stylist Dress-up Game.

## 4.3 Conducting the Questionnaire

The following chapters focus on introducing the questionnaire more closely. The results and conclusions about the results are also presented.

### 4.3.1 The Questionnaire

The questionnaire has three sections and 32 questions. The questionnaire is both for the research of Julia Ahjovaara's thesis [12] and this thesis. The third section, which has questions about the overall gameplay, is not introduced here as it does not concern this thesis.

The first section is the demographics. It has four questions, which ask the tester's age, gender, location and whether they have played dress-up games before or not. The questions about the testers' demographics are included to see if there is any correlation between the demographics and the answers.

The second section contains questions about how the tester's liked the different user interfaces. There are three types of questions: ones that ask to rate each user interface version independently, ones that ask to rate the user interface versions against each other, and open-ended questions.

The questions that ask the testers to rate the user interface versions against each other are about which user interface version was the easiest to use, which one had the best button placements, which one looks the most appealing, which had the best color scheme and which one was their favourite overall.

As for the questions that are formatted so that the testers can rate the user interfaces independently, the following topics are asked: how easy-to-use, intuitive and complex they found them, did they easily understand how they can change the appearance of the doll, did they find the placement of the buttons convenient, and did they easily find what they were looking for in each user interface. The questions are formatted so that there is clearly a "negative" side which means the user interface is lacking in the aspect the question asks about and a "positive" side which means the user interface is excelling in that aspect. These questions were chosen to give more detailed ratings about each aspect, compared to just seeing which of the user interfaces the testers consider to be the best in certain aspects.

The open-ended questions, to which the testers can write the answers themselves, are all optional. They ask about why the user interface they chose to be the most appealing looks appealing to them and why

the color scheme they chose as the best one looks the best to them. There is also a question for color blind people that asks if they had problems with the game because of their color blindness, and if they did, what kind of problems did they have. Also, the last question of this section asks the testers to tell in their own words what they liked about the user interface versions and what they did not like. These questions were chosen to hopefully give more insight about the results and the tester's thoughts behind the ratings.

Many of the questions ask the same things but are formatted differently. This is to get more definitive answers. Usability of an user interface is important, so many of the questions ask about it. Especially with simple user interfaces like these, the users should immediately and intuitively understand how they work. They should also be able to use them comfortably. For dress-up games, buttons are the most important user interface element, so their placement affects the user experience a lot. This is why a couple of the questions ask solely about them. Overall, the questionnaire should give a comprehensive view of what the testers think of the different user interface styles.

For the complete questionnaire, see Appendix A.

### 4.3.2 The Test Group Demographics

The game was advertised on the channels of University of Turku. Many of the testers were gathered this way. It was also advertised on Instagram among a group of people who have potentially played dress-up games before and are familiar with them. Some of the testers are also friends and family. Through these channels, 35 people answered to the questionnaire.

The demographics of the test group are not an indicator of what kind of people like to play dress-up games. They are just there to give more context to the answers, and it is important to understand that if the respondents were solely taken from a group of people who actually play dress-up games regularly, the answers might differ.

The demographics have been gathered according to the results from the questionnaire. Figure 23 shows the ages of the different testers. Most of the respondents are under 30: 40%, the largest demographic, are 21 to 29 years old, 31.4% are 16 to 20 years old and 8.6% are 15 or under. 14.3% are 30 to 39 years old, and there is only one person each

who are in their 40s and 50s. These demographics make sense considering the channels the game was advertised in.

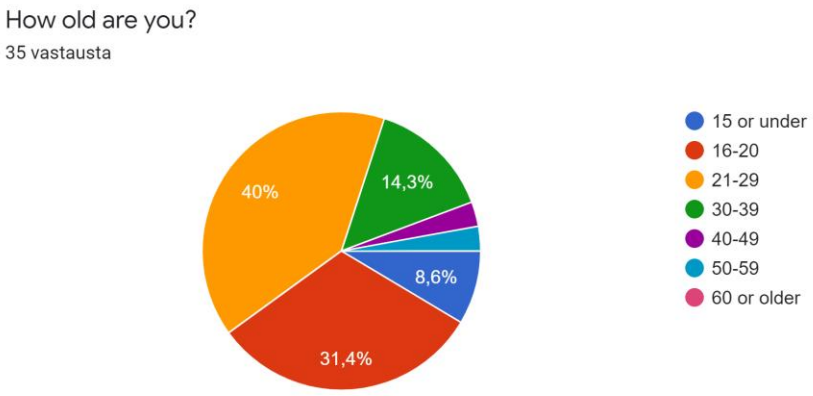


*Figure 23: Answers to the question "How old are you?" in the questionnaire.*

The gender of the respondents can be seen in Figure 24. 74.3% of the testers are female and 25.7% are male. This is understandable, considering that women might be more interested to test a dress-up game, and the Instagram page where the game was advertised in is mostly followed by females. This is also the preferable outcome, since women are the main target group of dress-up games and it is therefore important to see their preferences, but it is also good to see the male perspective.

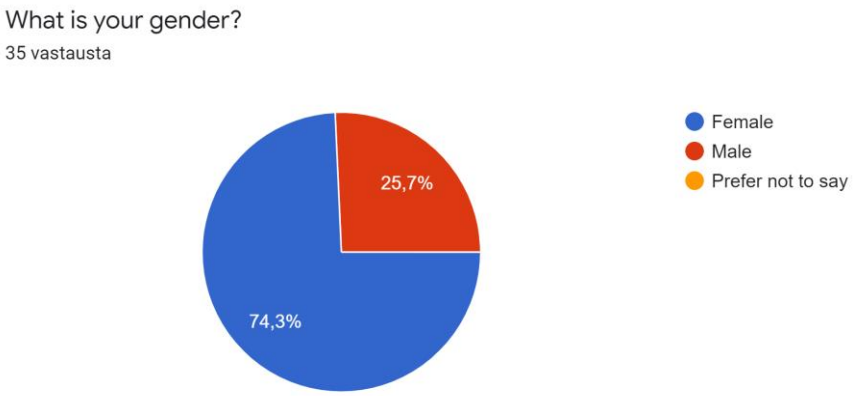


*Figure 24: Answers to the question "What is your gender?" in the questionnaire.*

The tester's location was also inquired. The results are shown in Figure 25. Most of the people are from Europe (65.7%), which is unsurprising considering that the University of Turku, where the game was advertised at, is located in Europe. There are also respondents from the Americas, Asia and Australia.

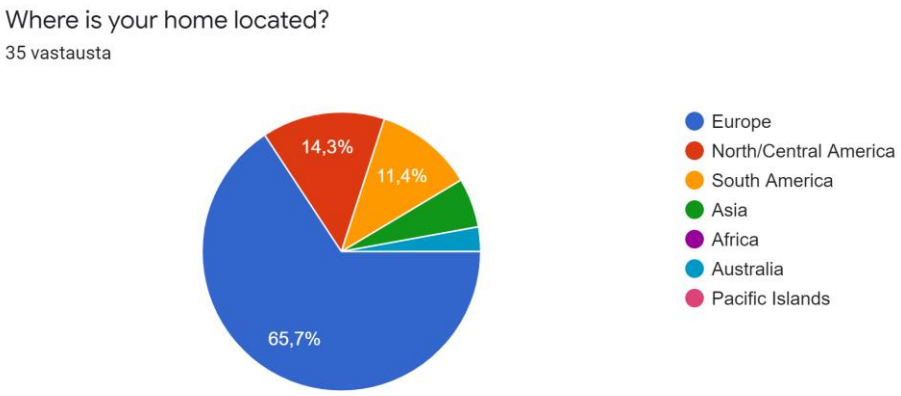


*Figure 25: Answers to the question "Where is your home located?" in the questionnaire.*

Lastly, Figure 26 shows if the testers have played dress-up games before and how much. Almost half of the testers say they have played dress-up games a lot, and the rest have quite equally either tried them or have not played them at all. It is good that the testers are divided in

this aspect so that we will see perspectives of both veterans and new players.

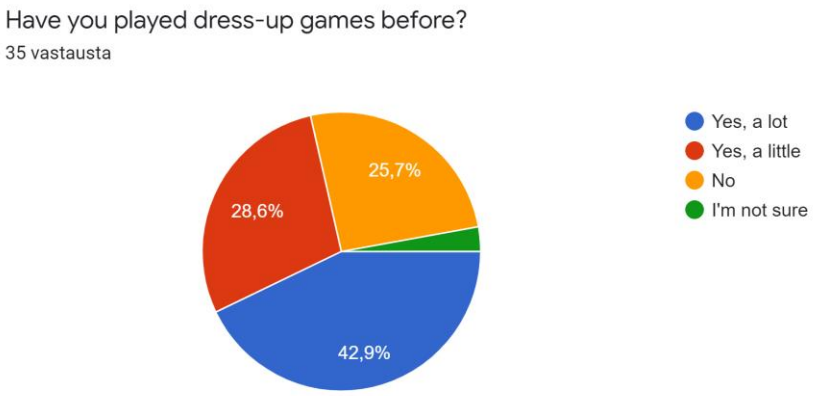


*Figure 26: Answers to the question "Have you played dress-up games before?" in the questionnaire.*

### 4.3.3 Results

Since the questionnaire includes questions for both Julia Ahjovaara's thesis and for this thesis, only the results that concern this thesis are presented. If one is curious about the other results, they can see Julia Ahjovaara's thesis [12]. The graphs that are shown in this chapter are generated automatically by Google Forms.

Figure 27 shows that most of the testers thought that the UI1 is the easiest to use, as over half of them (54.3%) answered so. 28.6% thought that UI2 is the easiest to use, and only 11.4% thought that UI3 is the easiest to use.

Figure 28 complements these findings, as almost everyone rated UI1 as easy to use and none rated it as hard to use. As for UI2, the testers were more divided. Exactly 15 people rated it as easy to use and 15 people also rated it as slightly hard to use. Three people even rated it as hard to use. UI3 follows this same pattern, but leans more into the "hard to use" side. 10 people still found it easy to use, but 19 people found it slightly hard to use. Only four people found it hard to use.

Considering how low the vote amounts are to the "hard to use" option in each user interface version, it is relatively safe to say that none of

them were too hard to use. UI1 just seems to be a lot easier to use than the other versions.

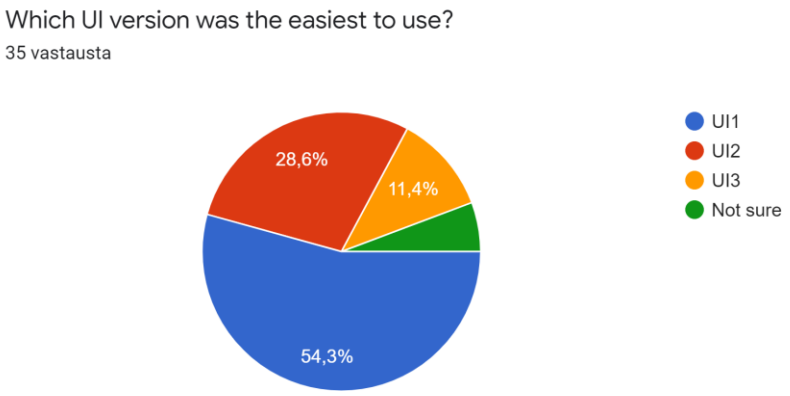


*Figure 27: Answers to the question "Which UI version was the easiest to use?" in the questionnaire.*

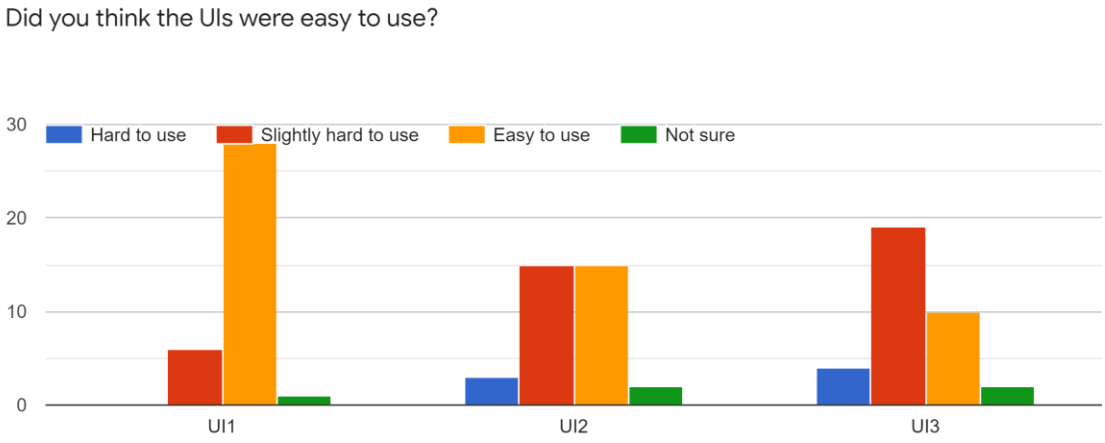


*Figure 28: Answers to the question "Did you think the UIs were easy to use?" in the questionnaire.*

Figure 29 complements these findings as well, but it still shows that none of the user interfaces were greatly complex. For each UI, most of the testers thought that they were not complex at all. Again, UI1 is thought to be the least complex, UI2 got a bit more votes leaning to

slightly more complex, and UI3 got even more votes leaning to complex.

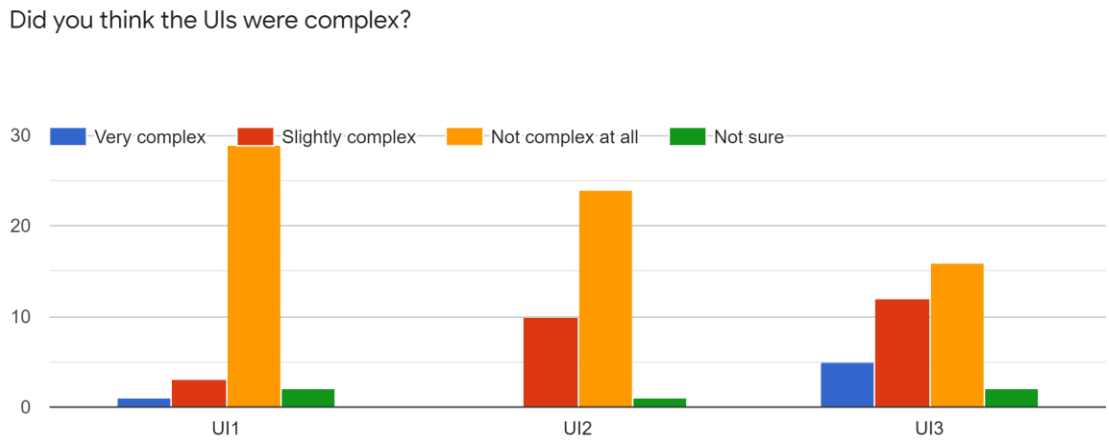


*Figure 29: Answers to the question "Did you think the UIs were complex?" in the questionnaire.*

Intuitiveness of the user interfaces was asked in two differently worded questions. Figure 30 shows vote counts to the question "Did you think the UIs were intuitive?" and Figure 31 shows them to the question "Did you easily understand how you can change the appearance of the doll?". The latter question was added to get a better view of the intuitiveness rather than just straight up asking the users if the user interfaces are intuitive.

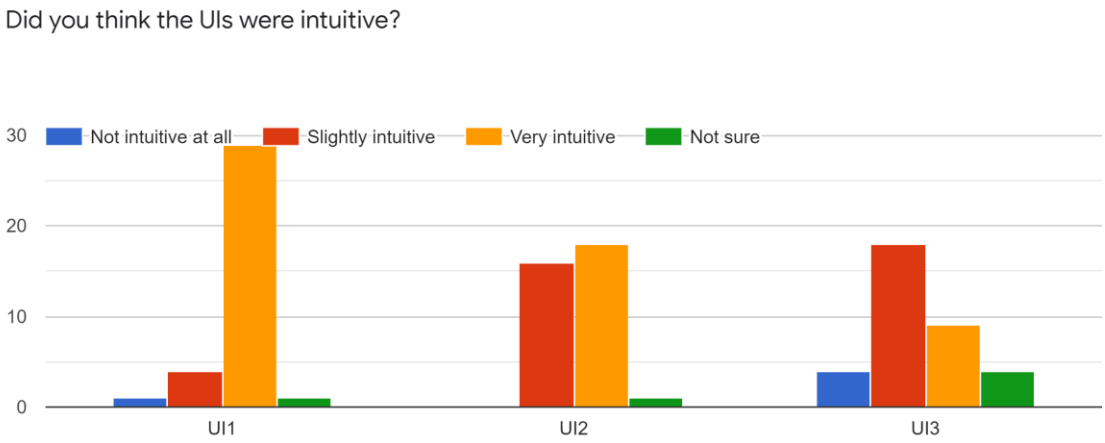


*Figure 30: Answers to the question "Did you think the UIs were intuitive?" in the questionnaire.*

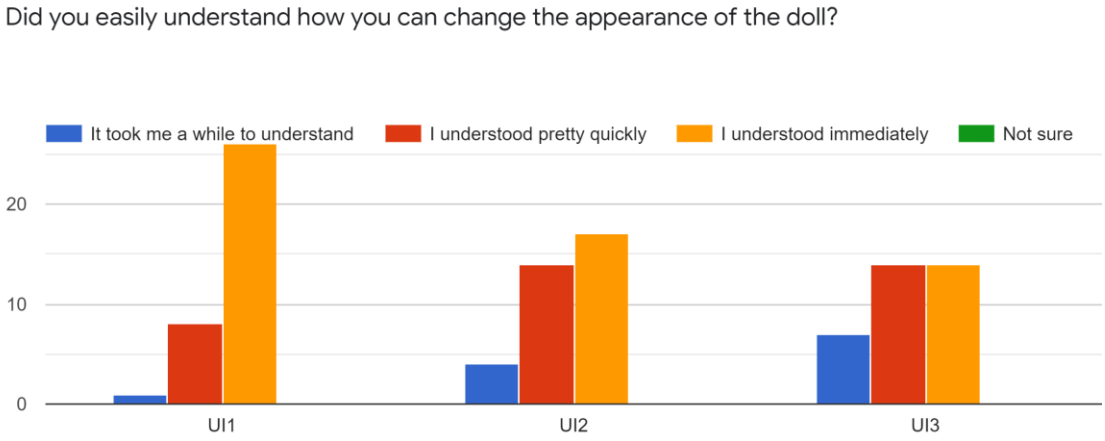


*Figure 31: Answers to the question "Did you easily understand how you can change the appearance of the doll?" in the questionnaire.*

Figure 30 shows that almost everyone voted UI1 as very intuitive. UI2 was quite evenly split on slightly intuitive and very intuitive, and UI3 mostly got votes for slightly intuitive and four people even voted it as not intuitive at all.

As the figures show, the vote counts are similar for both questions. Interestingly, for UI3, the vote counts in the second question for "I

understood pretty quickly how you can change the appearance of the doll" and "I understood immediately how you can change the appearance of the doll" are exactly the same. So UI3 got more votes in favor of intuitiveness in Figure 31's question than in Figure 30's question.

Figure 32 shows answers to the question "Did you easily find what you were looking for in each UI?". The answers are again similar to the other questions: UI1 has clearly the most votes for the most positive options, for UI2 the votes are more split and for UI3 the votes lean more negative compared to the other ones, while still leaning more towards the positive.

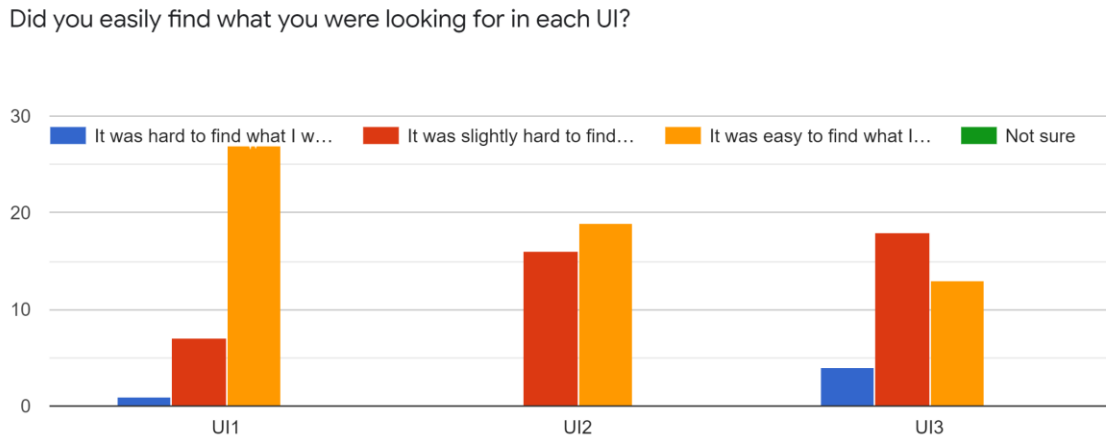


*Figure 32: Answers to the question "Did you easily find what you were looking for in each UI?" in the questionnaire.*

The questionnaire had two questions about the button placements. The answers for the question "Did you find the placement of the buttons convenient in each UI?" are shown in Figure 33 and the answers for the question "Which UI version had the best button placements?" are shown in Figure 34.

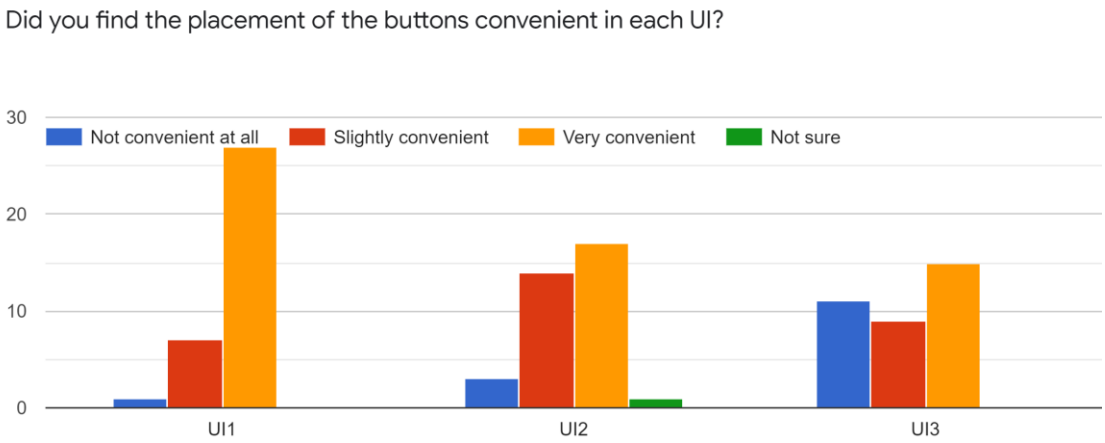


*Figure 33: Answers to the question "Did you find the placement of the buttons convenient in each UI?" in the questionnaire.*

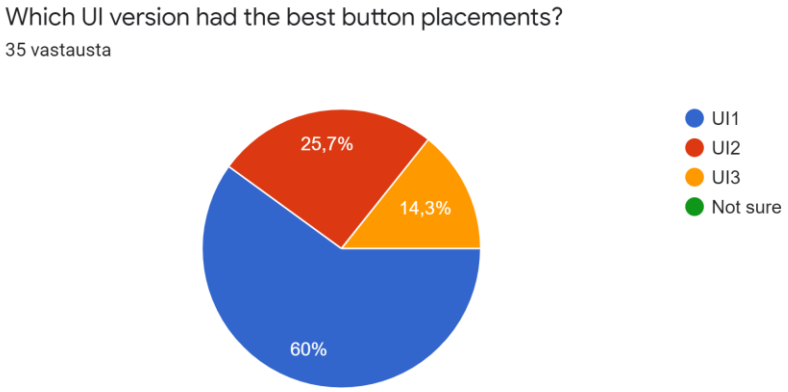


*Figure 34: Answers to the question "Which UI version had the best button placements?" in the questionnaire.*

Figure 34 shows that UI1 was rated as having the best button placements the most with 60%. For UI2 the percent is 25.7% and for UI3 14.3%. These ratings reflect the results seen in Figure 33, with UI1 getting the most positive answer ratio. For UI3, the results are split with 11 people rating the button placements as "not convenient at all" and 15 people rating them as "very convenient".

There are a few patterns that can be noticed from the answers to the open-ended questions concerning usability. Many people seemed to

like how in UI1, the character had a lot of space around it and the arrangement of the buttons was praised. It was also liked how one can see many options at the same time. UI1 did not get much negative feedback, but one person said that the category buttons were too small to tap on with a thumb, and that there could be a visual indicator that shows that the category menu is scrollable.

UI2 got some praise for having the character in the middle. It seems that for some the user interface was very intuitive, while some people did not find it intuitive at all. Some did not like how you had to scroll more to see all the options, and also the top buttons were too high up for comfortable use.

What people liked about UI3 was that it was more organized and had deeper categorisation, but many also criticized it for having too many menus. It seems that it is the same case as with UI2, that some people find it intuitive and some people do not. UI3 did get a lot of critical feedback. Many people thought that it looked too crowded and that there were too many elements visually competing with the doll.

Interestingly, one person wrote “UI3 was harder because of the words and not the pictures describing the selections.” It is possible that UI3 is seen as more crowded because of the use of text instead of symbols.

Next are the results for more appearance-based questions. Figure 35 shows answers to the question “Which UI version looks the most appealing to you?”. The answers are almost evenly split between UI1 and UI2, with both getting approximately 45% of the votes. UI3 got only 11% of them. The open-ended answers give more insight into why this is. Many people chose their favourite based on the color scheme, but the arrangement of the user interface elements is also brought up often in the answers. For UI2, many people seemed to find it appealing that the doll is in the middle and the buttons are placed symmetrically around the doll. As for UI1, most of the of the answers praised its colors.

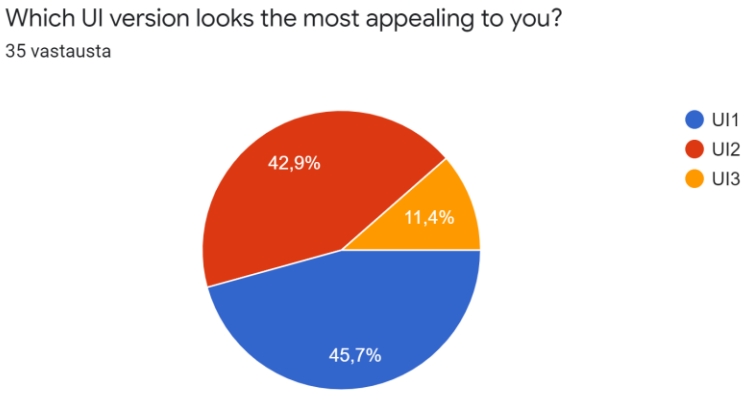


*Figure 35: Answers to the question "Which UI version looks the most appealing to you?" in the questionnaire.*

Figure 36 shows answers to the question "Which UI version has the best color scheme?". UI1 got the most votes with 60%, UI2 came second with 25.7% and UI3 is last with 14.3%. According to the open-ended answers, UI1 is popular because the colors are seen as girly and the background color is a neutral beige. Many found UI2 to be pretty, but it is criticized for having too many different colors which make it look busier, and the colors are also seen as too light. UI3 is criticized for being too dark, while some testers also preferred the darkness as it makes the doll and the clothes stand out more.

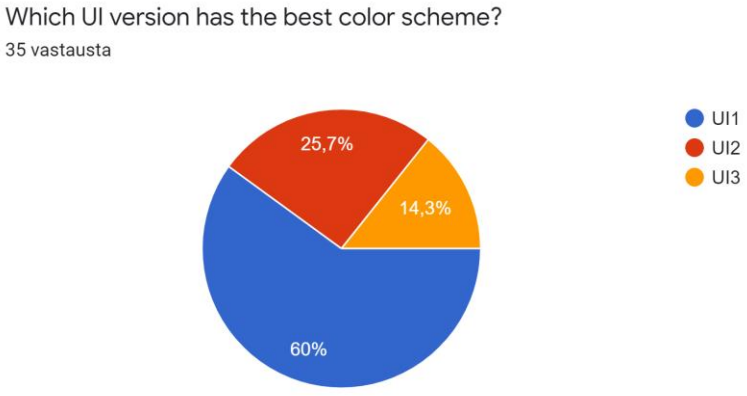


*Figure 36: Answers to the question "Which UI version has the best color scheme?" in the questionnaire.*

Unfortunately, no one answered the question “If you are color blind and you had problems with the game because of that, what kind of problems did you have?”. It is unknown whether that is because there is no color blind people among the testers, or if all of the user interfaces were suitable for color blind people. In hindsight, a separate question asking the testers if they are color blind should have been added.

Lastly, Figure 37 shows the results to the question asking the testers their favourite user interface version.

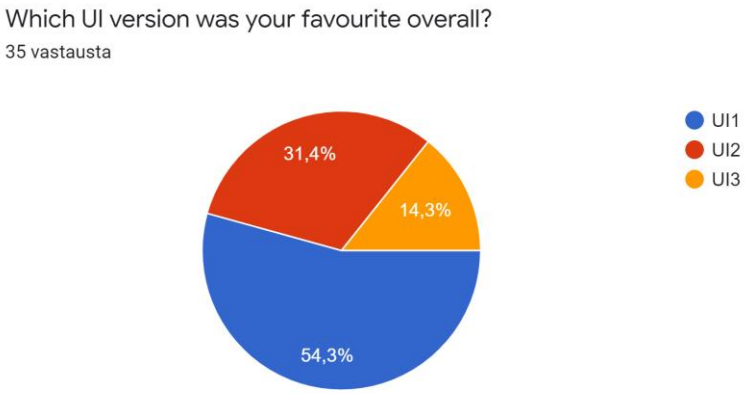


*Figure 37: Answers to the question “Which UI version was your favourite overall?” in the questionnaire.*

### 4.3.4 Analysis of the Results

The answers generally follow the same pattern with most of the testers preferring UI1 and not caring for UI3. UI3 still has its fans, although they are a minority. Still, it would seem that none of the user interface versions were thought of as terrible. The answers to the questionnaire are mostly positive for each version, UI1 is just the most popular of them.

It is to be noted that UI1 and UI3 are more controversial as the answers are quite split when it comes to intuitiveness and ease of use. This could be because of the testers’ past experiences with software and what they are used to. The questionnaire as a whole is very

subjective, which is why I ran some tests to compare the opinions of different demographics.

As the sample size is small and there is not a lot of representation for each demographic because of that, proper tests such as the Chi-Square Test of Independence cannot confidently be run as they would not give conclusive results. Therefore, I simply created bar charts for quick visual observation. All of the demographic variables (age, gender, location and past dress-up game experience) were chosen into the tests and compared against some of the questions about user interface preferences. Again, because of the small sample size, the tests cannot be trusted to reveal any huge findings, but some results were still interesting. The most interesting results will now be presented.

The results presented in section 4.3.3 show that UI1 had overwhelmingly the most popular color scheme. However, in the open-ended answers many people said that they prefer that color scheme because they assume that the game's target audience likes the color pink. Therefore, it is unclear if the testers actually prefer that color scheme, or if they just assume that the target audience likes it and choose it based on that. The assumed target audience is young girls, so I tested the color scheme preference against the age and gender of the testers.

Figure 38 shows a bar chart with testers' ages on the rows and the testers' color scheme preference on the columns. It is interesting to note that no one under 20 years old chose the UI3, which has a dark color scheme. Other than that, the younger people chose either UI1 and UI2 quite evenly, so there is not an obvious preference in the younger age groups.

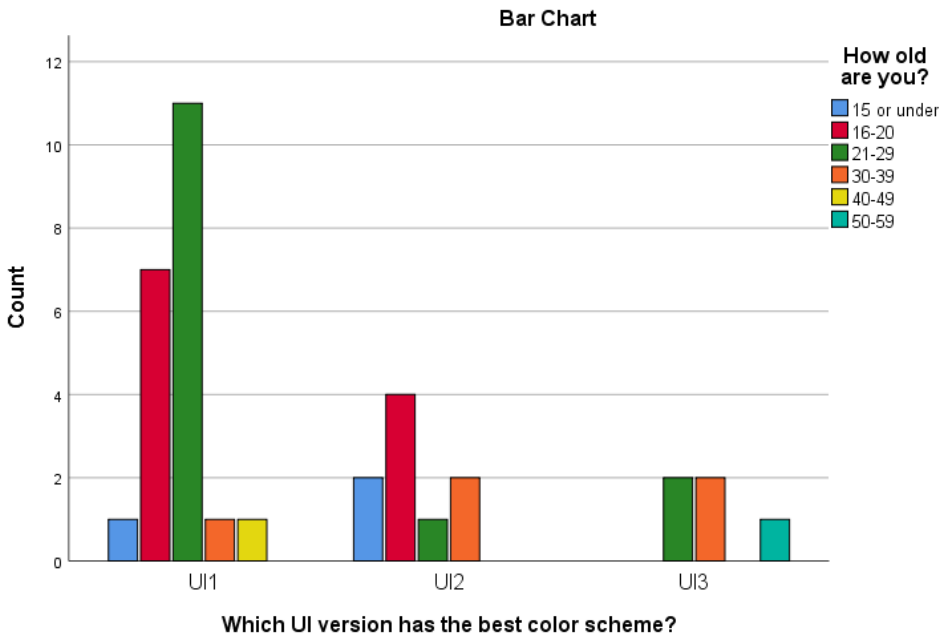


*Figure 38: Bar chart comparing the answers to the question "How old are you?" with the question "Which UI version has the best color scheme?".*

Figure 39 shows the testers' gender with their color scheme preference. Although females greatly preferred UI1's color scheme, the males did so as well. Therefore, it cannot be concluded that gender would affect the color scheme preference of these user interfaces.

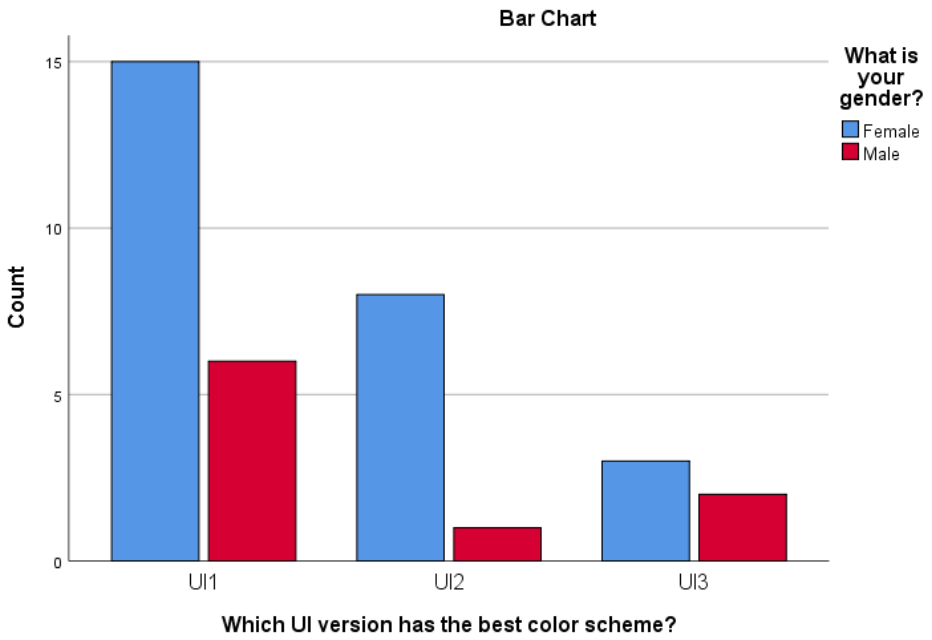


*Figure 39: Bar chart comparing the answers to the question "What is your gender?" with the question "Which UI version has the best color scheme?".*

What is interesting is that the people who have played dress-up games a lot before chose UI1's color scheme as their favourite by a large margin, while the people who had not played them or had only played them a little did not have any clear favourites. Figure 40 shows these results.

It could be assumed that the people who are very familiar with dress-up games know what they are usually like, and therefore chose the color scheme that would be the most fitting for the genre. In other words, they did not show their real preference, and instead chose what they thought a game of this genre should have. This would be in line with the open-ended questions where the testers wrote that they thought UI1 was the best because it would be appealing to the target audience.

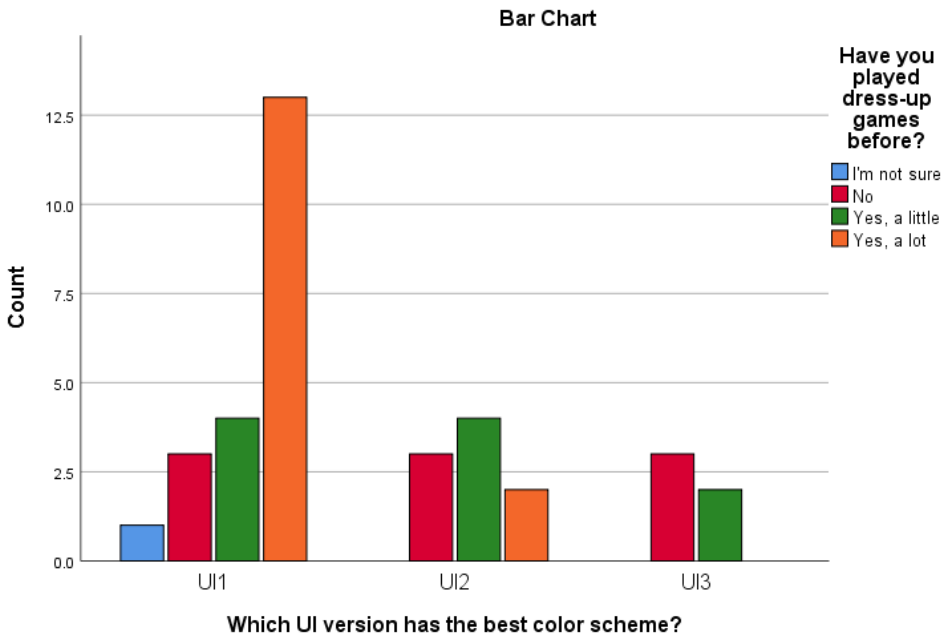


*Figure 40: Bar chart comparing the answers to the question "Have you played dress-up games before?" with the question "Which UI version has the best color scheme?".*

Testers with past experience in playing dress-up games prefer UI1 overall. They overwhelmingly chose it as their favourite user interface, as Figure 41 shows. Figure 42 also shows that they found it to be the easiest to use. The style of UI1 is used a lot in dress-up games, which might make it more appealing and easier to use to the experienced players, as it is familiar to them. The testers who have not played dress-up games before show preference towards UI2 in both figures, although the preference is not huge. This might indicate that if a user is not familiar with any of the three user interfaces, UI2 is the most intuitive for them, but any clear conclusions cannot be made. UI3 on the other hand is unpopular even among the testers with no prior knowledge of dress-up games.

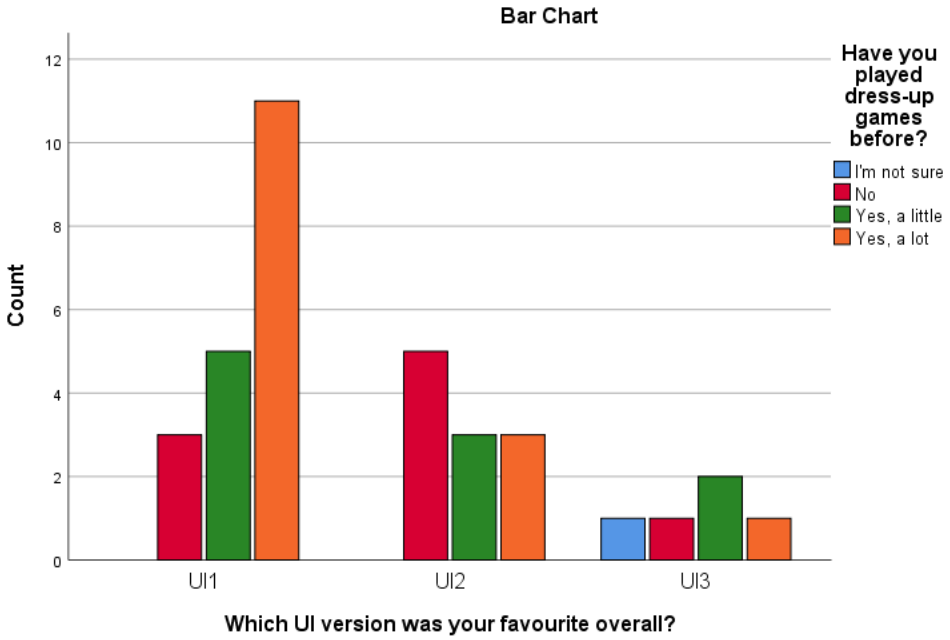


*Figure 41: Bar chart comparing the answers to the question "Have you played dress-up games before?" with the question "Which UI version was your favourite overall?".*

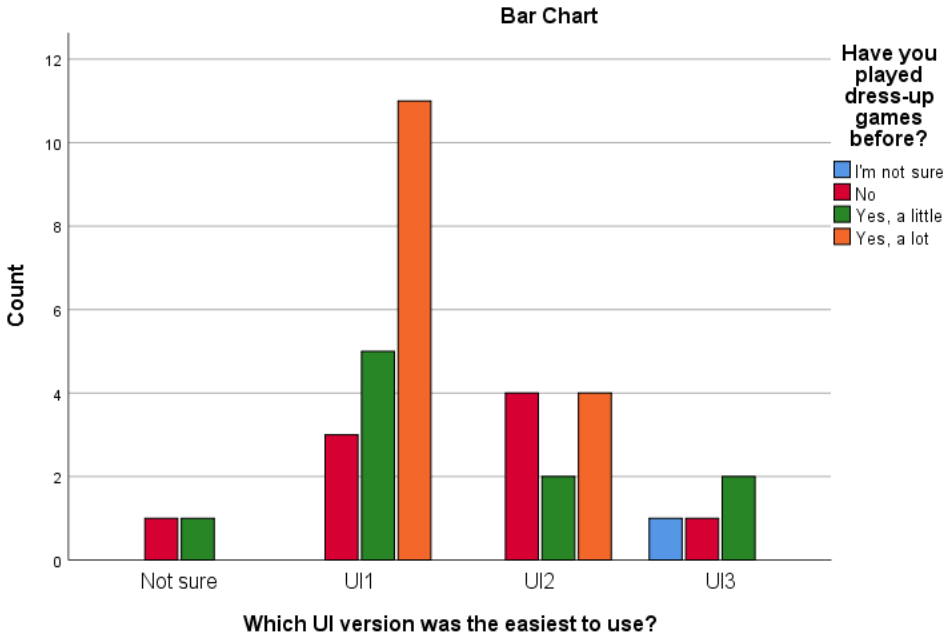


*Figure 42: Bar chart comparing the answers to the question "Have you played dress-up games before?" with the question "Which UI version was the easiest to use?".*

## 4.4 Discussion

The research questions for this thesis were as follows:

RQ1: What kind of user interfaces do mobile dress-up games generally have?

RQ2: What kind of user interfaces make for a good user experience in mobile dress-up games?

The RQ1 is answered mainly in Chapter 3. I found two commonly used user interface layouts, the side-scroller and the top-down-split layouts. The top-down-split style is used by many different developers and seems to be the dominating style at the moment. The other layouts that do not fall into either of these two categories still used similar techniques, such as the button carousel elements and categorization. All of the games heavily utilize buttons, which is the most important user interface element in dress-up games.

I also found some qualities that many of the user interfaces have. All of them use symbols in at least some amounts and all but one of the tested games use categorization to present the different appearance options to the player. Many of the games had bright colour schemes that were mostly either pink or lila. About half of the games also did not use any background music or sound effects, which is further proof that dress-up games are mainly a visual genre. Despite this, color blindness was not properly taken into account in one third of the games.

Chapter 4 answers the RQ2. The top-down-split user interface which was used in UI1 turned out to be the most popular user interface, but this could be due to it being familiar to a large portion of the testers. If this familiarity is removed, UI1 and UI2 could both be equally intuitive and easy-to-use for the users. According to the open-ended answers, UI1 has some advantages such as all of the commonly used buttons being on the lower part of the screen which makes reaching them easier, and it also shows more clothing options at once. In UI2, the user is forced to scroll more.

UI3 is unpopular, which is in part because of the heavier categorization. The user has to navigate through three different menus, which some testers found cumbersome. This shows that although categorization is good, it needs to be used in the right way to avoid causing extra steps for the user. One tester also criticized the use of text in UI3 and many said that UI3 looks too crowded, which is an indicator that text should be used sparingly.

As for the colors, it was deemed that the neutral background of UI1 made the user experience better. The dark color scheme of UI3 was also liked by some for making the bright colors stand out more. UI2 used more colors than the other user interfaces and the colors were also pastel. This had a negative effect on the user experience, as the use of too many colors made it look busy and the light colors were harder to differentiate.

# 5 Conclusion

The main goal of this study was to give an overview of the user interfaces of dress-up games and study how the different user interfaces affect the user experience. It also tries to record evolution of user interface trends in dress-up games.

Chapter 2 aimed to present the evolution of trends. I have no personal experience with dress-up games prior to the 2000s, so the findings before that are based on articles that could be found on the internet. Rest of the chapter was based on my own experiences, as no previous writings could be found of the topic.

The chapter showed the main points of the evolution. All of the biggest shifts in trends were recorded, from paper dolls and drag-and-drop -style of user interfaces to the boom in complex games creating need for categorization, and finally to the move from desktop to mobile. These points create a decent groundwork for recording the history of dress-up games' user interfaces.

In reality, there exists and have existed hundreds, possibly thousands of games from different developers. It would take more than a brief chapter to introduce all of the various styles of user interfaces people have come up with. In the future, it would be interesting to see someone take up on the challenge of digging deep into the history, especially into the times of the Flash boom, to create a more in-depth record of the different styles.

Chapter 3 focused on the second goal of giving an overview of the user interfaces of today's dress-up games. This was done by studying 50 different dress-up games that have been uploaded to the Google Play Store. The games were chosen based on certain criteria, to make sure that they give a good representation of games that are popular nowadays.

Although the games were picked randomly and seemingly from different developers, an unfortunate coincidence happened where

many of the games were made by the same developer under different pen names. This caused many of the games have an exact same user interface which was not used in any of the other games on the list. In hindsight, the list could have been altered and some of these games could have been removed. However, considering that the goal was to choose some of the more popular games and these games are very popular, the popular games are still presented.

Although the occurrence of these very similar games may alter the results, they at least give an accurate representation of what kind of user interfaces dominate the market at the moment of collecting the sample. I named the user interface layout that these overrepresented games have as the "side-scroller" user interface. I also found another common layout, which I named the "top-down-split" user interface. This layout is very common among different developers, making it the most important user interface style that was found during this research. Both of these layouts are also used in the user experience study of different user interface styles.

To analyse the games' user interfaces in more detail, I created specific questions which I would use in analysing each game. The questions were chosen based on qualities that were discovered when examining a sample of the test game group beforehand. I will now go through the most important findings.

Almost half of the test game group does not have any sounds. From the ones that have, half have only background music, making the amount of games that have both background music and sound effects 26%. Therefore, it is uncommon for dress-up games to utilize sounds to their full potential. This notion could be studied more in the future: research could be done to see, for example, if using more immersive soundscapes would better the user experience or if they would only distract from the goal of the game.

A pink or lila color scheme was also found to be a common quality of the sample group's user interfaces. As dress-up games are mainly made for girls, it is no surprise that many of the games aim for a "girly" look.

One of the questions concerned categorization, which is a convenient way to present a huge amount of clothing options to the player. Almost every one of the games used categorization in the user interfaces, making it a stable in the user interfaces of dress-up games. The

research also found that all of the games used symbols in at least some amounts to represent button actions.

In the end, Chapter 3 met its goal in giving an overview of the current user interfaces in dress-up games. Some common user interface layouts were identified and detailed qualities of the user interfaces are also presented. For an even more in-depth analysis, more detailed features could be analysed. For example, this study presents some of the common buttons that can be found in the user interfaces, but there are many that are not presented.

Chapter 4 showed a practical study of how different user interface styles affect the user experience. The study was conducted by creating a game with three distinct user interfaces and having a group of testers play it and answer to a questionnaire. There are a few noteworthy findings.

The User Interface 1 was by far the most popular among the testers in various categories. It was found to be the easiest to use, the most intuitive and it had the most popular color scheme. It was chosen as the tester's favourite user interface the most times as well. In many cases, the User Interface 2 was not far behind. UI1 and UI2 actually got an equal amount of answers to the question "Which UI version looks the most appealing to you?". The User Interface 3 on the other hand was the least popular, although it still had its fans.

When comparing the answers with the demographics, it was found that the testers who have lots of prior experience with dress-up games show the most preference towards UI1. The testers who have little to no experience do not actually show any clear preferences between UI1 and UI2. Given that UI1 uses a layout that is very common among dress-up games, it may have been the most popular in various aspects because of familiarity. This means that when it comes to the preferences in color schemes, intuitiveness and ease of use, UI1 and UI2 are actually equal if prior experience is removed, with UI2 possibly even being the more preferred one.

The open-ended questions may explain the unpopularity of UI3. It was seen as crowded, with too many menus. The use of text instead of symbols may be contributing to the feeling of it being too crowded.

The study does have some problems. To get more accurate results and comparisons between the opinions of different demographics, more

testers would be needed. At the moment, the results are only directional and no confident conclusions can be made.

The aim of the study was also to study the color scheme preferences. Adding this factor into the mix may have made some of the results a bit unclear. In hindsight, it would have been better to separate the studies on layouts and color schemes. Each layout could have had the same color scheme, and then one of the user interfaces could have come in different color schemes. This way the color schemes would not have had any effect on the preferences of the three different user interfaces.

The test group was gathered from various sources, but none of the sources were directly affiliated with fans of dress-up games. Although it was not necessary for this study to have testers with prior experience with dress-up games, it would be interesting to see a similar study conducted only with them as the testers. The study could for example be promoted in already popular dress-up games, so that only the people who play dress-up games would find it. This way the demographics of dress-up games' audience could be studied. The results of the study could also be utilized more in the development of dress-up games because they would reflect the opinions of the target audience.

In the end, the results of this thesis are satisfactory. This topic has not really been explored in scientific research until now, so it is a good starting point for future research. Hopefully this thesis sparks more interest in the field to study this genre.

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Appendix A)

# Dress-up Game survey - Demographics

You can download the game here if you haven't tried it:
https://play.google.com/store/apps/details?id=com.JJCuteGameStudio.CuteFashionStylistDressupGame

You can answer open-ended questions either in English or Finnish.

*Pakollinen

1. How old are you? *

*Merkitse vain yksi soikio.*

- ◯ 15 or under
- ◯ 16-20
- ◯ 21-29
- ◯ 30-39
- ◯ 40-49
- ◯ 50-59
- ◯ 60 or older

2. What is your gender? *

*Merkitse vain yksi soikio.*

- ◯ Female
- ◯ Male
- ◯ Prefer not to say
- ◯ Muu: _____

3. Where is your home located? *

*Merkitse vain yksi soikio.*

- ◯ Europe
- ◯ North/Central America
- ◯ South America
- ◯ Asia
- ◯ Africa
- ◯ Australia
- ◯ Pacific Islands
- ◯ Muu: _____

4. Have you played dress-up games before? *

*Merkitse vain yksi soikio.*

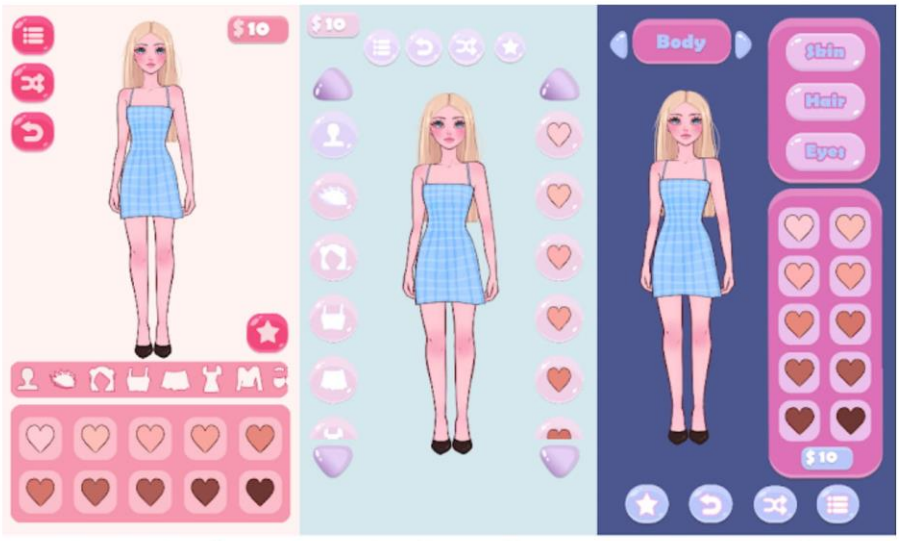
- ◯ Yes, a lot
- ◯ Yes, a little
- ◯ No
- ◯ I'm not sure

*Siirry kysymykseen 5*

## UI comparisons

Questions about the different User Interface (UI) versions of the game. Please answer for each UI version independently.

User Interface versions




5. Did you think the UIs were easy to use? *

*Merkitse vain yksi soikio riviä kohden.*

| | Hard to use | Slightly hard to use | Easy to use | Not sure |
|---|---|---|---|---|
| UI1 | ◯ | ◯ | ◯ | ◯ |
| UI2 | ◯ | ◯ | ◯ | ◯ |
| UI3 | ◯ | ◯ | ◯ | ◯ |

6. Did you think the UIs were intuitive? *

*Merkitse vain yksi soikio riviä kohden.*

| | Not intuitive at all | Slightly intuitive | Very intuitive | Not sure |
|---|---|---|---|---|
| UI1 | ◯ | ◯ | ◯ | ◯ |
| UI2 | ◯ | ◯ | ◯ | ◯ |
| UI3 | ◯ | ◯ | ◯ | ◯ |

7. Did you easily understand how you can change the appearance of the doll? *

*Merkitse vain yksi soikio riviä kohden.*

| | It took me a while to understand | I understood pretty quickly | I understood immediately | Not sure |
|---|---|---|---|---|
| UI1 | ◯ | ◯ | ◯ | ◯ |
| UI2 | ◯ | ◯ | ◯ | ◯ |
| UI3 | ◯ | ◯ | ◯ | ◯ |

8. Did you think the UIs were complex? *

*Merkitse vain yksi soikio riviä kohden.*

| | Very complex | Slightly complex | Not complex at all | Not sure |
|---|---|---|---|---|
| UI1 | ◯ | ◯ | ◯ | ◯ |
| UI2 | ◯ | ◯ | ◯ | ◯ |
| UI3 | ◯ | ◯ | ◯ | ◯ |

9. Did you find the placement of the buttons convenient in each UI? *

*Merkitse vain yksi soikio riviä kohden.*

| | Not convenient at all | Slightly convenient | Very convenient | Not sure |
|---|---|---|---|---|
| UI1 | ◯ | ◯ | ◯ | ◯ |
| UI2 | ◯ | ◯ | ◯ | ◯ |
| UI3 | ◯ | ◯ | ◯ | ◯ |

10. Did you easily find what you were looking for in each UI? *

*Merkitse vain yksi soikio riviä kohden.*

| | It was hard to find what I was looking for | It was slightly hard to find what I was looking for | It was easy to find what I was looking for | Not sure |
|---|---|---|---|---|
| UI1 | ◯ | ◯ | ◯ | ◯ |
| UI2 | ◯ | ◯ | ◯ | ◯ |
| UI3 | ◯ | ◯ | ◯ | ◯ |

11. Which UI version was the easiest to use? *

*Merkitse vain yksi soikio.*

- ◯ UI1
- ◯ UI2
- ◯ UI3
- ◯ Not sure

12. Which UI version had the best button placements? *

*Merkitse vain yksi soikio.*

- ◯ UI1
- ◯ UI2
- ◯ UI3
- ◯ Not sure

13. Which UI version looks the most appealing to you? *

*Merkitse vain yksi soikio.*

- ◯ UI1
- ◯ UI2
- ◯ UI3

14. (Optional) Why do you think it looks the most appealing?

_____

_____

_____

_____

_____

15. Which UI version has the best color scheme? *

*Merkitse vain yksi soikio.*

- ◯ UI1
- ◯ UI2
- ◯ UI3

16. (Optional) Why do you think it has the best color scheme?

17. (Optional) If you are color blind and you had problems with the game because of that, what kind of problems did you have?

18. Which UI version was your favourite overall? *

*Merkitse vain yksi soikio.*

- UI1
- UI2
- UI3

19. (Optional) In your own words, please tell what you liked about the UI versions and what didn't you like?

General Questions

General questions about the game as a whole.

20. How would you rate the game on a scale of 1 to 5? *

*Merkitse vain yksi soikio.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Awful | ◯ | ◯ | ◯ | ◯ | ◯ | Awesome! |

21. How difficult did you find the challenges in the game? *

*Merkitse vain yksi soikio.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Easy | ◯ | ◯ | ◯ | ◯ | ◯ | Hard |

22. Would you like to be able to change the gender of the doll? *

*Merkitse vain yksi soikio.*

- ◯ Yes
- ◯ No
- ◯ Maybe

23. Would you like to be able to save a screenshot of the finished doll to your phone? *

*Merkitse vain yksi soikio.*

- ◯ Yes
- ◯ No
- ◯ Maybe

24. Would you like to be able to save and load the doll so that you could edit it at a later time? *

*Merkitse vain yksi soikio.*

- ◯ Yes
- ◯ No
- ◯ Maybe

25. Would you be ready to spend real money on the game to get more content (like clothes, backgrounds, more body options etc)? *

*Merkitse vain yksi soikio.*

- ◯ Yes
- ◯ No
- ◯ Maybe

26. Would you play the game again? *

*Merkitse vain yksi soikio.*

- ◯ Yes
- ◯ No
- ◯ Maybe

27. About how much time do you spend on playing a dress up game during one play session? *

*Merkitse vain yksi soikio.*

- ◯ Less than 10 minutes
- ◯ 10 to 20 minutes
- ◯ Over 20 minutes
- ◯ Not sure

28. Do you think the game needs a tutorial? *

*Merkitse vain yksi soikio.*

- ◯ Yes
- ◯ No
- ◯ Maybe

29. (Optional) If you think the game needs a tutorial, what aspect does it need a tutorial for?

30. Why do you play dress up games? (Choose all that apply) *

*Valitse kaikki sopivat vaihtoehdot.*

- ☐ To have fun
- ☐ To be inspired
- ☐ To be challenged
- ☐ To be creative
- ☐ To kill time
- ☐ I don't like to play dress up games

Muu: ☐ _____

31. (Optional) What did you like about the game?

32. (Optional) What would you change about the game or what kind of content would you add to the game?