TAMPERE UNIVERSITY
OF APPLIED SCIENCES

ANALYSIS AND DEVELOPMENT OF MEDIA EDUCATION SOLUTIONS FOR PRE- AND PRIMARY SCHOOLERS IN PIRKANMAA'S LIBRARIES

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ABSTRACT

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PÕLDOTS, KRISTINA:
Analysis and Development of Media Education Solutions for Pre- and Primary Schoolers in Pirkanmaa's Libraries
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The aim of this thesis was to analyse media education methods for preschoolers in Pirkanmaa's libraries and how to further develop these methods for primary schoolers. The objective was to make suggestions for developing the existing media education solutions. In addition, the goal was to create a general instructions manual to act as a basis for designers when designing children's applications.

The first part of this thesis emphasizes the importance of media education for children. It also outlines the basis of planning and implementing early childhood media education.

The theoretical section analyses different principles of designing for children. It discusses different parts of the design process in detail and examines whether these principles have been followed in previously created applications or not. In addition, it analyses the existing Finnish media education games for pre- and primary schoolers.

The third part of the thesis analyses the media education applications previously created for Pirkanmaa's libraries and their effectiveness. The results of the feedback received from the client and target users of these applications are also presented.

The findings indicate that there is a need for interactive media education solutions for primary schoolers in Finland and content creators need to follow certain design guidelines to be able to cover not only all the necessary topics but also to design visually effective and practical applications.

As a result of these findings, the practical part of the thesis also includes a visual instructions manual for designing applications for children and introduces a concept design for a media education application for Finnish speaking primary schoolers.

Keywords: media education, designing for children

CONTENTS

ABBREVIATIONS AND TERMS

Demola	an international organization that facilitates co-creation projects between university students and companies, either locally or internationally
Easter egg	intentional hidden message or feature in a game or a program
PIKI	Pirkanmaan libraries
User interface (UI)	a part of an application or an operating system through which users interact with a computer or software
UTA	University of Tampere
UX	user experience; stands for the quality of the experience a user has when interacting with a certain design
Selfie	a self-portrait photo that is usually taken with a digital camera or a camera phone held in the hand or supported by a selfie stick
TAMK	Tampere University of Applied Sciences
TUT	Tampere University of Technology

1 INTRODUCTION

The aim of this thesis was to analyse media education methods for preschoolers in Pirkanmaa's libraries and how to further develop these methods for primary schoolers.

The reason for choosing Pirkanmaa's libraries was my own involvement as a designer in creating media education applications such as Kirjatin Mediamatka for children attending study sessions there and Kirjatti User Interface for their website. I was fascinated by how simple the games and the graphics for children can look, yet how much work has to be put in and what a variety of factors have to be considered when creating them.

In my thesis I took a closer look at the importance of media education for children's development and how learning through games can teach or advance media literacy. I described different designing principles that are used when designing applications for children and examined whether these principles have been followed in my case examples or not.

Furthermore, I presented two media education projects mentioned above in which I had participated mostly as a graphic designer and their case studies. These were initially done for Hervanta's library in Tampere with the aim to educate preshoolers about media. Through these case studies I analysed the impact of these projects on the children visiting the library and gave an overview of the feedback received.

As a result of the findings, a concept design plan was created for a new media education application for children in grades 3-5. In addition, a visual design instructions manual was compiled to be used as a basis for designers when creating applications for children.

2 IMPORTANCE OF MEDIA EDUCATION FOR CHILDREN

Media education concept consists of two words – media and education. Media, in this context, is the means by which information, content and behaviours created around these means are transmitted and received. Education refers to methods of teaching and raising children together with media (Siibak 2010).

Media plays an essential and important part in a child's everyday life. According to a Kaiser Foundation study, each week children spend the equivalent of a full-time work week using media (Resources on Media and Media Literacy 2009). Since the ability to manage in our media environment has become more and more important, we need to pay attention to children's media education and communication in an online setting. It is essential to teach children how to use different media from a very early age so that by the time they reach school age, they have become diverse media users who know how media is created, understand different aspects of it, can apply critical thinking and can take advantage of possibilities offered by media, such as communicating, information gathering and entertainment.

Audio books, online games, movies, TV shows and TV advertisements affect children's perceptions of the world; however, children are not always able to distinguish between real and fictional presentation. We should concentrate on how to make children media literates with the help of media education. So far studies have addressed mostly the negative and unwanted effects of media that may leave a mark on both the child's mental and physical development as well as behaviour, but the guiding positive influences of it have gone greatly unnoticed (Siibak 2010).

2.1 Basis of planning and implementing early childhood media education

Media literacy does not offer a new subject to teach, but rather a new manner of teaching; even more importantly – a new manner of learning (Media Literacy: A National Priority for a Changing World 2004, 4). The goal is to influence children's media usage and develop their media literacy so they can learn how media influences their lives and emotions. When it comes to media, children first learn how to handle different media tools and therefore it is the task of preschools to develop children's

media literacy skills according to their age and abilities within the context of media education. (Vinter 2010, 144).

2.1.1 Learning through game

According to Livingstone (2010, 6), people learn best about media through creating it. Children's job is to play games and a game is a direct learning process that provides experience. Learning is a constant process that lasts for years, perpetuating knowledge and skills. A game is a tool that helps to develop children's social skills; playing develops children's perception, imagination, intellect, speech, manual activity, motor and communication skills. (Niineberg & Linnas 2007, 116).

Therefore, learning in preschools happens mostly through playing games, which is a child's most intrinsic activity (Vinter 2010, 152). Playing games comes naturally to children; it is a familiar activity that teaches them social behaviour and gives them knowledge and experience to manage successfully in life. When it comes to games, it is necessary to take into account the ways in which children think and learn as well as their skills and age-specific characteristics.

3 DESIGNING FOR CHILDREN

Children increasingly use computer technologies already from a very young age. Given the greater exposure of children to these technologies, it is imperative that they be designed taking into account children's abilities, interests and developmental needs (Hourcade 2008, 1).

3.1 Visual design

3.1.1 Symbols

Visual methods of interacting with the user are important to the success of any software intended for children who are still illiterate or just learning to read. Just as in case of adults, icons aimed at children have to be designed so that they represent actions or objects in a perceptible manner, are easily differentiable from each other, can be recognized as interactive and separate from the background and are as simple as possible without any distractions (Hourcade 2008, 315).

User experience tests of the Kirjatin Mediamatka game also showed that symbols should be big enough for children to easily click them. This method and Hourcade's advice was followed throughout the application (Picture 1).

Picture 1: Example of symbols used in the Kirjatin Mediamatka application.

3.1.2 Text

Use of text in applications should be minimal, especially for children who have not yet learned or who are just beginning to read (Hourcade 2008, 316).

It became obvious during the user experience testing of both Kirjatti projects that children, even though of the same age, are very differently developed and their understanding of text can vary quite a lot. Therefore, some compromises should be considered when including text.

3.1.3 Visual complexity

High visual complexity can overwhelm any user, let alone one who cannot process visual information as quickly as adults (Hourcade 2008, 316). According to Schneiderman (2003, 1–8), one way to deal with visual complexity is to use multilayer strategies where children are first given fewer challenges and objects, with more challenges and objects being added to the interface as children become more skilled.

The same method was used in the Kirjatin Mediamatka game where objects and their uses were explained to children mostly through visual means and in some cases through verbal means, with more details being added after successful practice.

3.2 Interaction methods

3.2.1 Direct manipulation

There are three thoughts behind the idea of direct manipulation: (1) the visibility of objects and actions of interest; (2) rapid, reversible, additive actions; (3) changing typed commands by pointing actions to the objects of interest (Cohen, M., Jacobs, S., Shneiderman, B., Plaisant, C. 2009, 232). Nowadays most of the software intended for children attempts to follow these ideas behind direct manipulation. However, the one idea that is often not followed in children's and adults' software alike is that of making actions rapid, reversible, and incremental (Hourcade 2008, 316).

Swift actions are fundamental when it comes to children's user interfaces because children are generally less patient than adults when playing games or using applications (Hourcade 2008, 316). Children need fast feedback and if they do not receive it, they will probably lose interest and move on to other activities. Our team experienced children's frustration with waiting during the paper prototype testing of the Kirjatin Mediamatka application. Actions such as switching paper buttons and symbols took too long to complete in time to give them fast feedback. Children should be given feedback on the state of the action (e.g. loading bar) and still be able to engage with the application or cancel the operation if they wish to. This type of a solution was also adopted in the applications of both Kirjatti projects (Picture 2). The applications have fun loading bars and children can look at simple animations while waiting. They can interact with the software at any moment during the waiting time, skip the instructions part or cancel the navigation to a different part of the application.

Picture 2: Screenshot of the state of the action feedback in a Kirjatti project application – loading page.

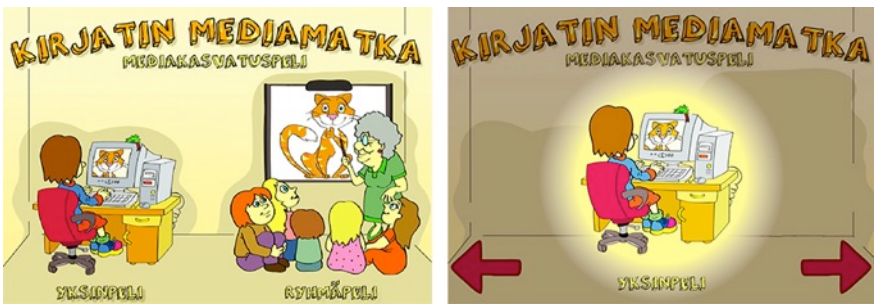
Reversibility of different actions is also important for children. They discover different possibilities of technologies in this manner and at the same time feel in control of their actions. In both Kirjatti projects children can go back and replay all the games in the applications. Children are in control and get to choose whether they want to proceed with the game, replay it or return to the main page and choose something else.

Making actions additive by adding slightly more complex features over time could also help children as it eliminates the need for them to dissect complicated instructions urgently. When combined with prompt and informative feedback, it can help children do difficult tasks (Hourcade 2008, 317).

3.2.2 Menus

Children are introduced to menus (i.e. sets of choices) in applications all the time. Problems arise when these choices are not instantly noticeable and are organized in drop-down menus or other sorts of interactive arrangements. Indeed, the navigation of menu sets has been proven to be puzzling for children (Hourcade 2008, 317). Danesh, Inkpen, Lau and Shu (2001, 393) noticed that even when working with 10- to 13-year-olds who used handheld computers, menus that had to be revealed using a soft key were more easily forgotten. Complications are especially acute in case of younger children, aged seven years and younger, who are in the pre-operational stage and who do not have good understanding of hierarchies.

Menus in the two Kirjatti applications were designed following the ideas of Danesh et al. (2001). Navigation buttons are quite elementary and recognisable (e.g. arrows pointing left and right for browsing back or forward) and in some cases highlighted or even spelled out verbally (Picture 3). The user interface of Kirjatin Mediamatka looks like a board game (Picture 14), so it is easier to follow the path that children need to navigate through (e.g. a drawn path with clickable icons or highlighted paw prints leading to next buttons to click on).



Picture 3: Examples of menu navigation in the Kirjatin Mediamatka application.

3.2.3 Text-based interactions

Text can also be puzzling for children when it is used as a tool to interact with the computer (e.g. typing). If children have not yet learned to type, this could slow down interactions noticeably and lead to frustration. This is also the reason why all navigation in the Kirjatti applications happens through visual means (Picture 4), except for in games where children are taught new words.

Picture 4: Examples of the Kirjatin Mediamatka application's interaction.

3.3 Use of sound

Research on the use of sound in user interfaces meant for children is almost non-existent. Jacko's (1996, 121-133) findings from studies done on children's ability to identify auditory icons have shown that as children get older, their ability to identify such icons improves. Results of the tests conducted by Mann, Newhouse, Pagram, Campbell and Shulz (2002, 305–306) with 12-year-olds indicate that the statistical differences between learning critical data with the help of momentary speech cues versus learning it with on-screen momentary text cues are non-significant. I acknowledge the conclusions drawn by Mann et al. (2002), but it also has to be kept in mind that the target groups of the two Kirjatti projects were almost the half the age and it can be predicted that the statistics for 6- to 7-year-olds show an increase in the

importance of momentary speech cues. This prediction is supported by the results of the user experience tests carried out for the Kirjatti projects where it was noted that children learned critical information specifically through narration.

Statistical differences noted by Mann et al. (2002) were nevertheless acknowledged when designing a new media education application for 9- to 12-year-olds. Some narrations were still included, since the studies by Mann et al. (2002, 306) also noted that children were more concentrated and silent and less restless and annoyed when listening to instructions and directions given with the help of speech cues.

3.4 Examples of Finnish educational games for children and their use of researched design principles

The two Kirjatti projects used as examples in this thesis and the Vilpertti project created in the practical part are only available for a Finnish speaking audience. Therefore, in order to introduce and further compare other educational games and applications for children, I have analysed only those available in Finnish. The purpose of the research is to see whether or not these applications use the design principles similar to the ones outlined in part 4 of this thesis. Since the Kirjatti applications are targeted at preschoolers and the Vilpertti project at primary schoolers, I will analyse educational games from these two categories. I have narrowed these games down to the ones most similar to the Kirjatti and the Vilpertti projects.

3.4.1. Educational games for preschoolers

Applications used for comparison are Ekapeli-Eskari, Pikin huone and Kielipäät. These were most similar to the Kirjatti projects due to some of their characteristics, such as educational content, target audience and design elements.

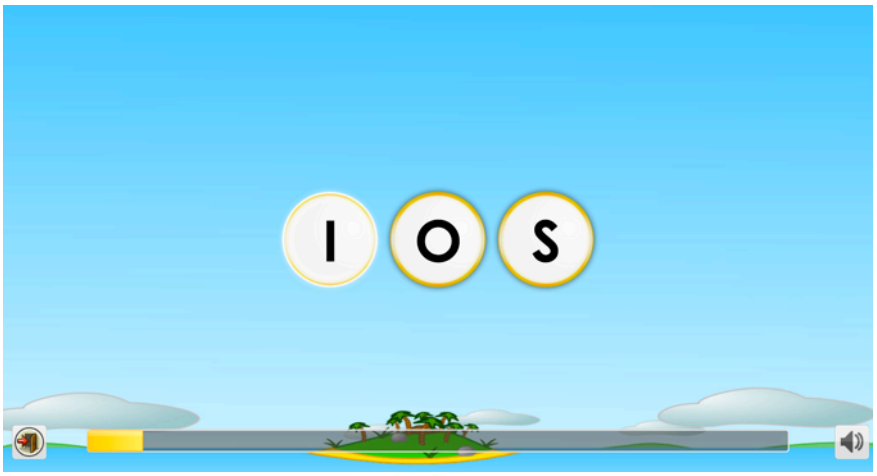
Ekapeli-Eskari

Ekapeli-Eskari is an educational game played on computers and mobile devices that teaches basics of literacy. It is primarily designed for preschoolers or older students who need training in identifying letter-sound connections. (Ekapeli lukemisen taitojen

harjoitteluun 2007.) Ekapeli-Eskari is a part of a wide-ranging Ekapeli game series that is structured and divided into several different learning games. It does not cover any media educational topics like the Kirjatti or Vilpertti projects, but it is good for comparison because of its visual structure and target group of preschoolers.

Most of the design principles of designing for children are followed in Ekapeli-Eskari. Symbols are interactive, easily noticeable and highlighted with colours. But the game itself is not entirely manageable by children who are just learning to read and write; therefore, a supervisor is needed to get through the rather long setup process of the game. It also seems that some symbols, such as quitting or continuing in some parts of the game, use text-based interactions and might be incomprehensible for preschoolers who are just learning to read. Sound is mostly well utilized throughout the game – characters give instructions to the player with the narrator's voice. Furthermore, game progress sound effects (e.g. correctly or falsely answered questions) are properly used and clearly understandable.

The most interesting part of Ekapeli-Eskari for me is the use of direct manipulation in the game of identifying letters through sound. The narrator says the letter she wants the player to pick out of the ones displayed on the screen (Picture 5). If the player picks the wrong letter out of the four provided, the letter will disappear and can no longer be selected, making it easier and more obvious to select the correct one. I think this is a great example of how to use this particular design principle and also a very important one, considering the target group's age and abilities.



Picture 5: Screenshot of the Ekapeli-Eskari game interface. (Ekapeli-Eskari 2007.)

Pikin huone

Pikin huone is a game that teaches safety culture and safe practices for preschoolers (Turvallisuus- ja kemikaalivirasto 2015). It has little to do with media education, but it is great for comparison due to its target users. Pikin huone is available on the Pikku Kakkonen website, which is a children's website hosted by the Finnish national broadcasting company Yle. Similarly to the Kirjatin Mediamatka application and the Kirjatti user interface, the Pikin huone game was also developed as a part of a Demola project.

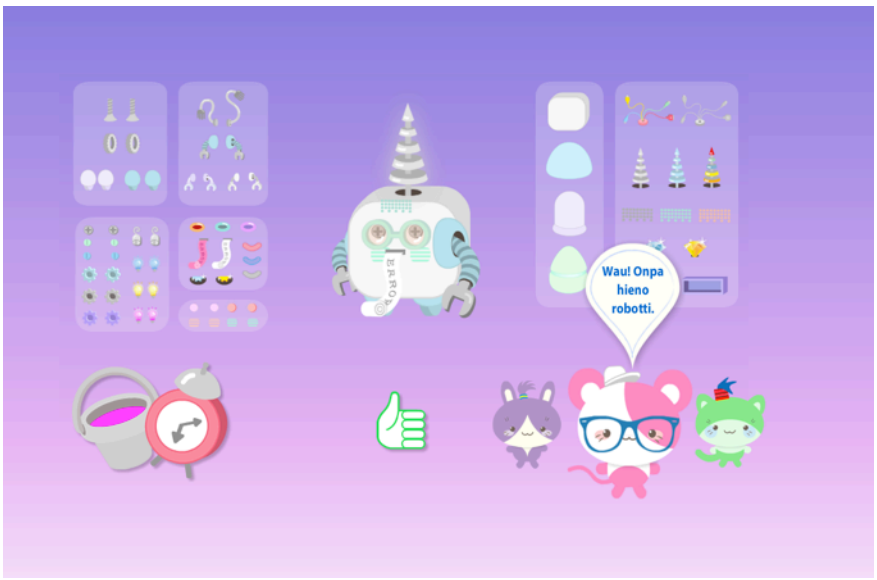
Visually Pikin huone is very child- and user-friendly. The symbols are fun, colourful and appealing. It is easy to distinguish clickable buttons in the user interface; this is achieved mostly thanks to the fact that game screen is kept clear from other useless decorative graphics (Picture 6). In comparison, Kirjatin Mediamatka has various background graphics to give the user interface more depth and make it more engaging. As a result, its navigation buttons have clearly been designed to stand out more with the help of animations or voiceovers. Since the target users of Pikin huone are preschoolers, the game could use better narrator's guidance. The narrator provides some instructions at the beginning of the tasks, but does not explain the purpose of these tasks or say how they can be completed; for example, it is not explained whether symbols have to be clicked or dragged, but preschoolers might not yet realize it on their own.

Picture 6: Screenshot of the main interface of the Pikin Huone game. (Pikin Huone 2015.)

Kielipäät

Kielipäät is a game that teaches basic words to preschoolers in three different languages – Finnish, Swedish and Sami. I chose this game for comparison because of how it is structured. For the most part, any preschooler should be capable of playing this game on their own thanks to properly placed symbols and well-used narrations. It is possible to choose between three characters throughout the whole game who all represent different languages. There are also three smaller games to choose from, all with a different task – painting, assembling a robot and playing hide-and-seek.

All instructions are clearly provided by narrating characters. The game also explains how actions should be performed within the tasks (e.g. if the player should drag the symbols or click on them). It can be said that the principles of designing for children were clearly followed when designing Kielipäät. Symbols and buttons are not only fun and colourful, but also recognisable (Picture 7). Visual complexity is kept to a minimum – some animations have been added to the graphics, but otherwise unnecessary additions have been avoided.



Picture 7: Screenshot of the interface of the robot assembling robot task in the Kielipäät game. (Kielipäät 2015.)

3.4.2. Educational games for primary schoolers

I have chosen Hiirimutaattori and Aparaattisaari for comparison in the field of educational games for primary schoolers. The target audiences of these two games match with Vilpertti's hypothetical 9- to 12-year-old users. The objective of these games is also similar – media education for primary schoolers.

Hiirimutaattori

Hiirimutaattori is an informative game for children about online safety, problems associated with gaming and copyright issues. The game teaches how to navigate online, what is not allowed there, how to avoid problematic situations and how to deal with online bullying. (Mediakasvatusseura 2014.)

Hiirimutaattori is a very simple game with very few side actions. There is no specific storyline in the game. The main character of the game is a static mouse in the middle of the screen (Picture 8). The purpose of the game is to choose different types of body parts (e.g. nose or tail), head accessories, clothing and background animations for the mouse from among the options presented at the bottom of the screen. Some of the parts are locked and the player has to answer a pop-up question about online safety and other similar topics in order to unlock them.

Picture 8: Screenshot of the main interface of the Hiirimutaattori game. (Hiirimutaattori 2006.)

The Hiirimutaatttori game has interesting questions and correct answers are accompanied by good explanations, but the educational part of the game is very text-based. All the questions and comments are written on the screen and accompanied only by brief sound effects. Too much attention is given to modifying the main characters looks instead of making the educational part equally appealing and fun.

Suuri mediaseikkailu

Suuri mediaseikkailu is an interactive website for 6- to 10-year-olds. Suuri mediaseikkailu inspires and guides the player through active and collaborative activities of the media world. Its aim is to strengthen the sense of community and participation and to develop the skills of doing things together (Suuri mediaseikkailu 2011).

The application has an interactive interface of a city (Picture 9) with different clickable areas. Players can choose between different topics; for instance, when clicking on the news building, the player will learn about how information can be found in different media outlets.

Picture 9: Screenshot of the main interface of the Suuri mediaseikkailu website. (Suuri mediaseikkailu 2010.)

The only interactive parts of the website are the interface and the navigation buttons in different areas of the screen. There are no media education related tasks or actions that players could perform within the applications itself. All tasks require working in a group, holding discussions with co-players in the same room or doing crafts. The application is just a tool to help initiate conversations and activities outside of it.

The user interface of the game is not very functional. Even though navigation buttons are visually well recognisable, it is still unclear what functions most of them have. Overall Suuri mediaseikkailu has used voice narrating efficiently, which makes following the given tasks much easier.

Aparaattisaari

Aparaattisaari is a story-like learning environment that supports the aims of the National Core Curriculum for Pre-primary Education (2016) regarding media literacy and information and communication technology skills (Aparaattisaari 2015). This game was released during the writing of this thesis and got its inspiration for content from the Kirjatti projects and the Vilpertti application idea. It has an appealing storyline, uses fun and age-appropriate narrations for characters (e.g. the scripts use more youthful and trendy words instead of childish vocabulary) and has a lot of educational context about media.

Aparaattisaari has great graphics (Picture 10) which makes the game very appealing for young audiences. Navigation buttons are well recognisable and all characters have different voices and personalities, which adds extra depth to the game and makes it more engaging.

Picture 10: Screenshot of the interface in the Amaraattisaari game. (Aparaattisaari 2015.)

Some of the tasks within the game cover useful educational content and topics, such as what activities are appropriate on the Internet or what type of content is suitable for children. For example, the player has to help a character called Messi Kämmen play a

mobile game, which is interrupted by friends inviting him to come and play outside or by his mother inviting him to eat (Picture 11). The player is given a choice between interrupting the game and continuing. This task is also a great example of direct manipulation – regardless of what option the player chooses, the outcome is still the same with the narrator explaining why it is not a good idea to play games for a long time and miss out on other activities. It is a good example of an important topic being explained in a fun and simple way.

Picture 11: Screenshot of the Grizzly Honeypaw game interface in the Aparaattisaari application. (Aparaattisaari 2015.)

However, the majority of the tasks still miss a specific media educational purpose and seem to exist solely for amusement, which in my opinion is a waste of the great potential of this educational game. Even though the game is designed for a slightly older target audience than Kirjatti's players, some topics covered in Kirjatti seem to be more informative and useful. In addition, the game is full of technical issues, such as getting stuck several times in the middle of the game, game not loading properly on mobile phones or tablets and some navigational errors that start to get annoying as they are repeated.

In conclusion, I did not find any games similar to the Kirjatti applications during my research that would generally cover media education topics for Finnish speaking preschoolers. They do follow the design principles for children, such as great visual appeal, for example, but they do not necessarily take into consideration all the other recommendations outlined in parts 4.1 to 4.3 of this thesis. Primary schoolers also do not have much to choose from, even though there are a few of games that partially cover

some important media education topics; however, these also have their shortcomings. An all-in-one solution for a media education game for primary schoolers seems to be missing from the market, which means the development plan of the Vilpertti application has great potential to fill this gap.

Regarding the visual side, I found that there are a lot of different factors a designer must consider when designing applications for children. It is easy to overlook some simple design principles that may end up becoming a big hindrance in a game meant for children (e.g. including text-based navigations when users might not have yet learned how to read). As a result, I have compiled a short yet essential list of instructions for designers who are planning to design an application or an interface for pre- and primary school children. This short instructions manual, which can be found in Appendix 3, contains brief descriptions of the main design principles that should be taken into account during the design process as well as advice on how to highlight and upgrade different aspects of applications.

4 MEDIA EDUCATION FOR PRESCHOOLERS IN PIRKANMAA'S LIBRARIES

Hervanta's library in Tampere has been organizing media education sessions for preschoolers for years. Due to constant changes in technology, it was necessary for them to update their teaching methods and materials and make these accessible in all Pirkanmaa´s libraries (PIKI) as well as on their website. The original materials of these sessions consisted of a PowerPoint presentation with bullet points and a few images. The presentation was presented by the library staff during the sessions, followed by a talk on related topics in order to generate discussions amongst the attending children.

In order to find a better solution, Tampere library collaborated with Demola. Demola is an international organization that facilitates co-creation projects between university students and companies, either locally or internationally (Demola 2016). The first project was created in 2011 and the second one in 2012. Teams of both projects were made up of exchange students and students from University of Tampere (UTA), Tampere University of Technology (TUT) and Tampere University of Applied Sciences (TAMK). I was part of both teams as a student of TAMK and had the role of a graphic designer; however, I also participated in other work, such as storyboard writing and UX testing.

Our main objective was to make media sessions more appealing for children by updating and redesigning current content.

4.1 Application: Kirjatin Mediamatka

The first project was Kirjatin Mediamatka where our team was given the task of developing a media education application for kindergarten and preschool children. This interactive application had to utilize gameplay features and be available online. Kirjatin Mediamatka had to be suitable for use in libraries' media education sessions for children, in schools for first-graders as well as at home. Our team had to come up with age-appropriate educational content and functional solutions dealing with the following media literacy related questions given to us by our client:

- What is a computer and what can you do with it?
- What is the Internet and what can you do with it?
- What is true and what is false in media?
- What kind of content is suitable for children and why are there age limits?

4.1.1 Planning

Our team started to plan the project by gathering and researching all information we could find about media education for 6- to 7-year-old children. Visiting the media education sessions for children at the library helped to understand what the session were lacking and how children reacted to them. Seeing how involved and active children became only at the end of the session when they were taught how to draw on a computer as a bonus convinced us that the more involved children are in the learning process, the more they learn.

The actual hands-on part of the planning started with brainstorming sessions during which several ideas were discussed between the team members and our client. We decided to go with the idea that the basis of the application should be a board game interface as this is something that is familiar to every child. In order to keep a child motivated and interested, we decided to include reward points, scores or something similar so that the child would keep playing until the very end. We also wanted to motivate children by having some kind of a storyline in the application, and since we had to somehow incorporate the library's fictional cat character Kirjatti into the game, we decided to give him the leading role.

4.1.2 Execution

Once the key features of the application were mapped out, we created a storyboard (Picture 1) based on the content that needed to be taught to children. The goal was to keep the educational content as simple as possible and make it visually attractive. In order to keep the children's concentration, we casted voice actors for Kirjatti and some of the other characters in the application.

Storyline

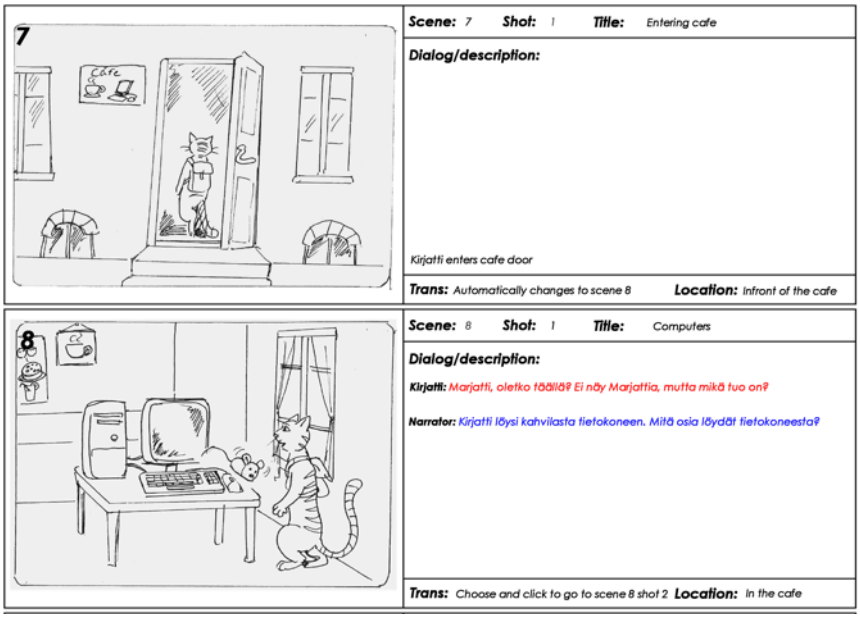
Our team came up with the story of the cat Kirjatti looking for his friend Marjatti throughout the game. While looking for her from different places on the map, he is learns about media and its various forms. At the end of every lesson or task he gets a puzzle piece that takes him closer to finding his friend. This was done in order to motivate children to play the game until the very end and keep them interested in learning new things.

Educational topics were chosen carefully in co-operation with the client and the staff of the library conducting the media sessions the application was being developed for. We decided on the following topics in order to try to cover the most important things that preschoolers should know at their age:

- What is a computer, a laptop and a tablet? What are their most important parts and how do they function?
- How to create a poster on a computer using a painting program? How to get the poster out of the computer and take it with you?
- What is the Internet and how does it work? What to do on the Internet? What is considered inappropriate behaviour on the Internet?
- What is true and what is fictional media (news, science books, fairy tale books, advertisement, video games)?
- Age-appropriate media content and how to avoid uncomfortable experiences.

Testing

The design process of the user interface and all the scenes and characters began with the client giving us constant feedback. The first paper sketches were completed and tested on our target group consisting of 6- and 7-year-old preshcoolers. Since the characters' voices were yet to be recorded, the paper prototype testing (Picture 12) was carried out on a small target group with our team members reading out the lines themselves. The paper prototype testing was conducted individually with eight children in total.



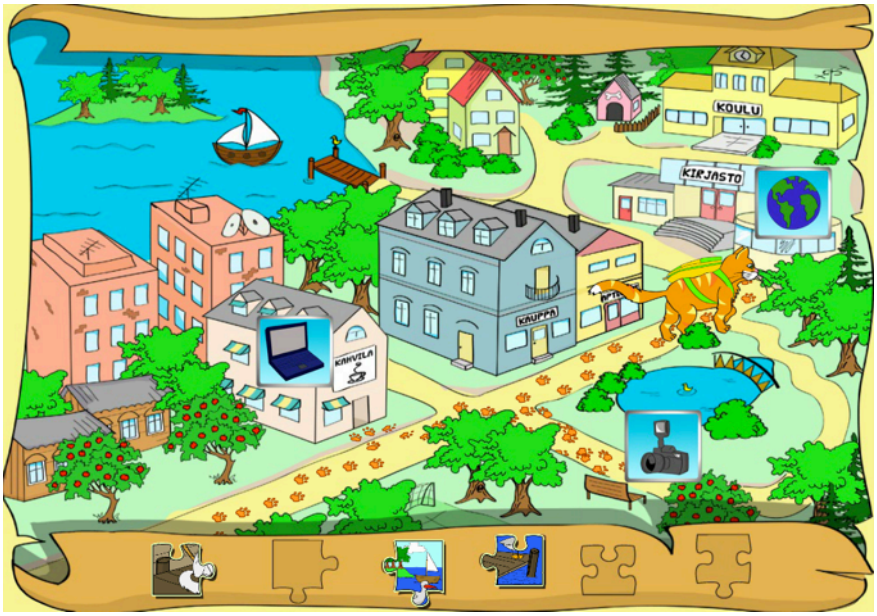
PICTURE 12. Image of a storyboard made for the Kirjatti application. Pictures on the left were used for the paper prototype testing (Kirjatin Mediamatka storyboard).

Even though the test was conducted using a paper prototype, we still managed to make some significant improvements to the storyboard after that. It was already clearly noticeable at this stage of the development where children navigated incorrectly or missed the idea behind some tasks.

Design

Since I was in charge of the design, I first came up with a new look for the library's mascot cat Kirjatti (Picture 13). This was requested by the client. The overall style of the game and other graphics were set after I had created the first design of the main interface (Picture 14). While all the graphics were being created, animations started to take shape as well. Furthermore, voice actors were recording their parts.

Picture 13: Old and new design of the Kirjatti character.



Picture 14: Main user interface of the Kirjatin Mediamatka application.

The final UX testing was done with our target group after everything was put together. The results were satisfying – the presentation went well and the game itself ran smoothly. Children loved the game and our client and the library staff were pleased with the outcome. Only a few modifications had to be made to fix some navigational issues that occurred during the presentation.

4.1.3 Result

The outcome of the project – the interactive application – was published on the PIKI website for children to play at home and incorporated into the media education sessions for preschoolers at Hervanta and Sampola libraries. Other Pirkanmaa's libraries with technical facilities have also adopted this presentation method.

The results of the UX testing conducted after the application was finalized and put into use as well as feedback from the library staff showed that children were more focused than before and participated in media education sessions more actively. Children were now allowed to decide and control what the game's character should do during different tasks and as a result participated more effectively in discussions.

Feedback result

In order to gather feedback about the Kirjatin Mediamatka game and to get some assistance for creating a development plan for a new application, I prepared a questionnaire for parents. The best way to reach parents was through children participating in media education sessions at Tampere libraries. I asked the library staff to give out flyers with my questions to children and kindergarten teachers visiting these sessions so that they could pass them on to parents. The aim of the feedback was to see whether children had mentioned the game at home or even wanted to play it again.

I received around 30 replies to the questionnaire that was handed out on paper as well as posted online. The results of the feedback showed that about 75% of the children had mentioned to their parents that they had participated in the Kirjatin Mediamatka media session at the library and around 60% of them remembered and described what they had learned. Most commonly children told parents how they learned to use a computer, but some children also described how they learned to use a mouse or discovered what USB memory sticks are for. These things were shown and explained in the game and it is excellent to see how small children with a relatively short attention span are still able to concentrate on important details in a relatively long game if it is designed correctly. However, even though children who participate in the libraries' media sessions are just 6-7 years old, only 40% of them said that they had learned something new. This shows that nowadays children are exposed to different types of media already from a very young age thanks to their older brothers or sisters and parents. However, it should be

noted that when I compared the usability testing results with the answers to this particular feedback question, it was evident that even though children recognise a lot of devices because they are either allowed to play some games on their parents' mobile phones or watch cartoons on a tablet, they still do not really know what else these devices are used for or how to properly handle them.

In conclusion, it seems that the Kirjatti Mediamatka application had an impact on children that used it, either by teaching them new things or by initiating discussions between them and their parents. Furthermore, about 30% of the parents said that they have played the game together with their children at home after the library session and 65% of them confirmed that their children have played the game again by themselves.

4.2 Application: Kirjatti User Interface

One year after finishing the first Kirjatin Mediamatka project, the Tampere city library started a new project, also through Demola. This time the request was to create an interactive web environment with gameplay features for the same target group of 6- and 7-year-olds.

The objective was to replace the current primitive interface on PIKI's webpage for children with an interactive and visually more appealing one. The website already included the Kirjatin Mediamatka application, but a lot of the other materials for children were out-dated. Old material had to be updated and combined into one interface. Once again the intention was to educate the target group about media and provide an interactive overview of the possibilities that the library has to offer in that regard.

4.2.1 Planning

Since the target group of this project remained the same, many of our ideas and design solutions were based on the research done previously for the Kirjatti Mediamatka project.

The client wanted our team to come up with several games that would somehow be related to the library – either something that could be done or learned there. In addition, all games had to be combined into one interactive user interface. Since the goal was to introduce different library functions and services to children, we decided that the interface should look like a library space.

With our client's permission we used Kirjatti as the main character for this project as well. The idea was to use a narrative of Kirjatti visiting a library and learning new things. Since interactivity and voice-overs add extra value to the narrative and keep children interested and focused, our team decided to use the same voice actors for our characters as before.

4.2.2 Execution

A storyboard was created for the user interface of the project. It included instructions on how to browse the interface as well as instructions of all the games.

My task was to come up with the designs, which I kept fairly simple, childlike, fun and colourful. My solution for the user interface was to make it look like the inside of a library and each game in the interface was represented by different areas of the library – info desk, café, bookshelves, play corner, meeting room (Picture 15).

Picture 15: Look of the Kirjatti user interface.

Areas become highlighted when the user hovers over them so that children could interact with the interface easily. All games are somehow related to the area they can be found in. For example, the Keijon Kirjasto game can be found at the info desk and in this game children can help the library lady find books that they are looking for. The Sanasoppa game in the café area teaches children how to form simple words out of letters found in their soup (Picture 16).

Picture 16: User interface of the Sanasoppa mini-game in the Kirjatti application.

Animations were done by my other teammates and all instructions were narrated by voice actors.

We tested the working demo on our target group of 6- and 7-year-old preschoolers who found the whole experience very entertaining. Several shortcomings were detected during the testing, such as children continuously clicking on the wrong areas of the screen for navigation or not noticing the blinking highlights indicating where to click. These were all corrected in the final version.

4.2.3 Result

The project produced an entertaining and playful user interface for PIKI's children's website page, introducing children to different types of library activities and services.

Using the Kirjatti webpage does not require literacy from children as all instructions and game contents are narrated by voice actors. Children are able to play these games on their own or with their parents present.

Altogether nine games were combined into the main interface, including Kirjatin Mediamatka, which was created during the course of the first project, and Kirjatin Kirjastokieppi, which was an already existing game in the library.

5 PRACTICAL PART: FURTHER DEVELOPMENT OF A MEDIA EDUCATION APPLICATION FOR PRIMARY SCHOOLERS IN PIRKANMAA'S LIBRARIES

In order to further develop the media education aspect in Pirkanmaa's libraries and to increase its impact not only on preschoolers but also on older children, it would be important to either redesign and update the currently used applications or to develop an entirely new concept to meet the current needs. I decided to present my new concept idea to Tampere library in connection with my thesis work. Even though it was not in their plans to undertake or fund any new projects, they still agreed to work with me on developing a new concept plan for an application, keeping in mind that this idea might be used sometime in the future.

Based on the feedback and the outcome of the two previous projects, it was decided together with the client that it is not necessary to redesign the current applications (Kirjatin Mediamatka and Kirjati User Interface) or add any additional subjects as these would make applications too content-heavy. Instead it was agreed that a new development plan should be created for a media education application for older children. Research on similar games in Finland also clearly showed that there is a lack of media education applications covering all necessary topics.

5.1 The brief

Taking into consideration the libraries' availability of resources, their network of schools in the area and assessment of all the possibilities, we decided together with the client that the target users of this new application should be 9- to 12-year-old primary school students. It made the most sense to create the continuation of the previous project one step higher on the age ladder. Compared to Kirjatin Mediamatka, more complex content had to be added in order to educate primary school children on subjects that they should be aware of at their age.

The goal of the whole project was to create a functional development plan for a media education application for primary schoolers. The plan was for PIKI libraries to

eventually either organize media education sessions similar to the ones held for preschoolers or compile content to be used at schools during special lessons.

Even though most of the libraries in Pirkanmaa have only one interactive screen that can be used by the instructor to demonstrate applications to children, it was technically important for the client to make the application accessible on different touchpad devices (e.g. Kirjatin Mediamatka is not supported on devices that do not run Flash Player, such as iPhones or iPads).

5.2 Planning

All the results and research previously outlined in this thesis and obtained during the development of currently used applications (Kirjatin Mediamatka and Kirjatti User Interface) have been essential when planning and creating content for the new game concept.

Since the new application is meant for older children than the Kirjatin Mediamatka target group, the idea for the main character came quickly – Kirjatti's older brother Vilpertti. Since the content itself is also educational, the application got the name Vilpertin Mediakoulu (Vilpertti's Media School).

The Vilpertin Mediakoulu application is in a way a continuation from Kirjatin Mediamatka. In Kirjatin Mediamatka preschoolers learn very basic things about media and its content is aimed at children in grades 1-3. In Vilpertin Mediamatka the content is more mature and requires some basic experience, such as already knowing how to use a computer, a tablet or a smartphone and having an idea of what the Internet is used for.

The content of the Vilpertin Mediamatka application is also divided into different mini-games, similarly to the Kirjatti projects. The interface of the application was designed to look like a classroom. Similarly to previous projects, different areas or rooms in the interface lead to different mini-games or tasks.

5.3 Creation of educational content

The educational content of the application was discussed and decided upon in co-operation with the client. Combining my own ideas with the client's wishes, the objective of the game was formulated as follows: to teach children different methods of using the Internet and mobile devices in a way that would benefit them. In addition, parallels are drawn with traditional media; for example, how one can easily read a book or news on a tablet or play games with friends on the Internet. Age limits and behavioural methods are also explained in a fun and playful way.

Educational topics were divided into different groups:

- Laptop – short introduction of a laptop and its functions. Short introduction of the Internet. More detailed explanation of what a website is, what types of websites there are, how to search information and how and where to watch videos. Examples are given using some of the most common and popular websites (e.g. Google, YouTube).
- Mobile devices – short introduction of a tablet and smartphone and their functionalities.
- Online bullying – definition of bullying and how to deal with the issue online.
- Tablet – describing some of the most common activities that can be performed on a tablet, such as reading and playing games.
- Smartphone – discussing the positive and negative sides of uploading personal information and photos online.
- Internet – more specific information about the Internet. Listening to music online, making video calls. Examples are given using some of the most common and popular applications (e.g. Spotify, YouTube, Skype, Facetime).
- Internet part 2 – definition and discussion of age limits on the Internet and in other media.
- Computer games – introducing different types of games and the possibilities of playing with friends online.

The division of topics and the interface design support each other visually and contextually.

5.4 Visual content design

Since Vilpertin Mediakoulu is a continuation of the previous Kirjatti project, the style of the whole application remains the same. The overall emphasis is on simplicity, playfulness and brightness.

Main character

The main character of the application is Kirjatti's older brother Vilpertti (Picture 17) who is a 9-year-old primary school student. Like most characters in children's games, Vilpertti also has its own personality. He is a quick-witted and kind-hearted little boy who loves adventures and enjoys playing video games.

Picture 17: Designs of the main character of the Vilpertin Mediakoulu application.

Overall style

When creating the graphics, I took into account research done on designing for children. Symbols are designed so that they can be recognised as interactive and separate from the background (Picture 18). Use of text is kept to a minimum because this is still an important aspect, even though the target group is of the age where they can already read. In order not to overwhelm the user with complex visuals, the first tasks of the application include fewer objects and challenges. After some common symbols have been introduced and navigation has been explained and the user has become more skilled, additional challenges and objects are added to the interface.

Picture 18: Example of navigation symbols in the Vilpertin Mediakoulu application.

Similarly to Kirjatti applications, different areas of the interface are distinctively highlighted and interactive as they are clickable and lead to other mini-games in the application. It is unlikely for a user to be misled as the concept of direct manipulation is being followed. Different parts of the interface are grouped together and turned into a button which does not let any excess graphics to mislead the user (Picture 19).

Picture 19: User interface of the recess room in the Vilpertin Mediakoulu application. Hovering over grouped graphics shows the user an interactive area.

The main interface of Vilpertin Mediakoulu is designed to look like a classroom (Picture 20). The activities in the classroom are more serious (e.g. functionalities of laptops, tablets and smartphones) as opposed to the recess room where tasks are more fun and contain topics related to entertainment (e.g. playing videogames, making video calls, listening to music). In the classroom direct manipulation is less obvious, but this is intentionally so.

Picture 20: Main interface of the Vilpertin Mediakoulu application. Classroom interface.

5.5 Functionality

The main interface (the classroom) is the first thing that is displayed when the application is launched. Educational content is divided and associated with different parts of the interface. Children can hover over these different parts and choose different games to play. For example, clicking on the door and Kirjatti's character will take the user out of the classroom into the second interface, which is the recess area, while clicking on the window will pause the game, reminding the user to take breaks and go outside to play (Picture 21). Detailed explanations of different areas of the application can be found in Appendix 1.

Picture 21: Example of different interactive parts of the interface in the Vilpertin Mediakoulu application.

In addition, there are small animations known as Easter eggs (Picture 22) hidden throughout the interface and the whole application which can be triggered by clicking or hovering over them with the mouse pointer. These are added for amusement and do not lead anywhere.

Picture 22: Animated Easter eggs of the Vilperti Mediakoulu interface. The hiding mouse, the rearranging letters and the ticking clock become animated when hovered over with a mouse and clicked or tapped.

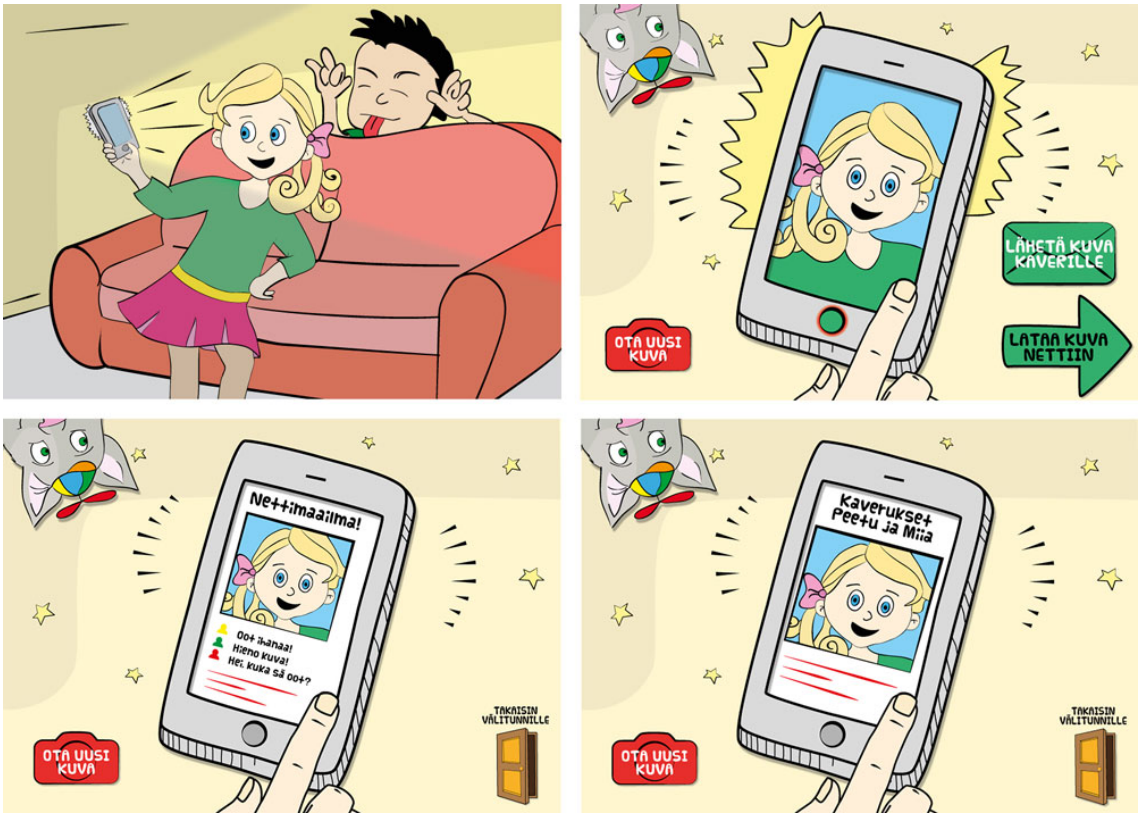
Narrating

The leading narrator of the application is a voice actor portrayed as a teacher. Her role is to present educational content to users. The task of the main character Vilpertti is to explain how to use the interface. Since he is also a primary school student, he will accompany children throughout the application and learn together with them about media. Vilpertti plays the role of a friend or a classmate for the users, providing them support and guidance whenever needed. He also makes small talk and drops humorous comments to keep the users entertained.

Setup

All the sections of both interfaces include either fun interactive animations or simple games to help introduce or explain the educational content of the application. It is important to keep children's concentration and interest this way.

One example of a game that can be played in the recess room interface is about taking and sharing photos with a smartphone. The aim is to teach children what can be done with the photos taken with a smartphone (e.g. sent to a friend or uploaded online) and what kind of consequences it can have (Picture 23). The game lets the users take a selfie photo of the animated character and gives them options for proceeding – retake the photo, send it to a friend or upload it online. When either of the last two options is selected, the user is taught what positive and negative outcomes there might be when you share your personal photos with a friend or with strangers.



Picture 23: Picture of the smartphone photo game interface in the Vilpertin Mediakoulu application.

Symbols of the smartphone photo game are self-explanatory and recognisable by their visual appearance and added text. These are well visible and clearly distinct from the background. First an animation is shown of a girl character taking selfies and then the user has the opportunity to take a photo of the girl by clicking on the highlighted and animated button on the phone. The girl character is animated until the user clicks on the button and takes the photo. After that the user can choose from the navigation menu what to do with the photo. When the selection is made, the teacher narrator will talk about the topic. Vilpetti's character appears in the corner, slightly animated and with a few speech lines for entertainment so that the user would be aware of his presence.

Another example is the discussion section added to the classroom interface of the application (Picture 24). The discussion board is designed to look like a part of the classroom. It has been added so that users could communicate with Vilpertti on the topics of media. Users can submit their media related questions online, which will then be moderated and made visible to other players in the application offline. Application administrators will answer the questions as the main character Vilpertti.

Picture 24: Discussion board in the Vilpertti Mediakoulu application.

More detailed descriptions of all the games in the Vlpertin Mediakoulu application can be found in Appendix 2.

5.6 Outcome and feedback

The outcome of the Vilpertti Mediamatka application is a concept presentation put together for the client (Appendix 2). The presentation consists of the initial designs for the application demo, introduction to the application, descriptions of different games within the application and their functionalities. Only the initial designs and an application concept were developed because there was no actual need or plan by the client to start with the new project right away; the complete project would require a team of various experts (e.g. usability designers, animators). This presentation functions as a proposal of a refined application project idea for the library.

Feedback from the organisers of the media sessions at the library was very positive. They were positively surprised by the visual interpretation and the structure behind the media topics that we discussed at the beginning of the project. Additional ideas were suggested for topics of the games which were presented as descriptions within the application. For example, that games should include fewer explanations and more opportunities for children to first complete the tasks on their own and test their abilities. All in all, the main point of concern was how to keep the tasks within the games challenging enough for primary school children.

6 CONCLUSION AND DISCUSSION

The purpose of media education in a broader sense is to influence children's media consumption and to practice media skills that in the long run would contribute to developing their media literacy. Media education for preschoolers was primitive in Finland until the Kirjatin Mediamatka application was released. This interactive game set the bar high for all the other existing educational materials. Children learn better and memorize information more likely through visuals and playing. Therefore, it is highly important to pay attention to refined and tested design principles when creating applications or interfaces for children.

The competition in the field of media educational applications for primary schoolers is not that much more intense. Those that stand out excel in some areas, but fall behind in others. There are no applications in Finland that would consider all the design principles that help children become excellent media literates. As a result, there is a gap in the market and the Vilpertin Mediakoulu application could be just the right thing to fill it.

If the client should decide to proceed with the project and turn the concept into a finished application, there is much more work to be done. A team of experts would have to be assembled to further revise the concept and test it with children, which is an invaluable part of application development.

Since the findings indicate that there is a lack of media education applications for children that would follow all the crucial guidelines leading to a successful result, the complied instruction manual added in the appendices could be a solution for that. It includes basic but very valuable information and advice for any designer wanting to design and create applications or interfaces for children. These instructions do not help only media education content creators but all game designers designing games for young children.

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APPENDICES

Appendix 1. Survey for feedback and research on Kirjatin Mediamatka (1)2

KIRJATIN MEDIAMATKA
-palautekysely

Hei! Olen Kristina Põldots Tampereen ammattikorkeakoulusta ja olen tekemässä lopputyötäni aiheesta "Esikoululaisten mediakasvatus Pirkanmaan kirjastoissa". Olen myös yksi Kirjatin Mediamatkan (kirjaston mediakasvatuspeli lapsille) suunnittelijoista.

Mikäli olette saaneet tämän esitteen, lapsenne on osallistunut mediakasvatuskäynnille kirjastossa ja haluaisin kerätä Kirjatin Mediamatkasta palautetta. Voitte vastata kyselyyn nimettömänä. Vastauksia käytetään osana opinnäytetyötäni. Vastauksienne avulla kerään myös palautetta Mediamatkasta ja ne ovat avuksi uuden mediakasvatussovelluksen kehityssuunnitelman koostamisessa.

Kysymyksille voitte vastata sähköisesti osoitteessa:
www.surveymonkey.com/s/VTYXQXS
Kyselyyn vastaaminen on vapaaehtoista.

Tästä pääset suoraan kysymyksiin:

Olen kiitollinen ajastanne!

Kirjatin Mediamatka medikasvatuspeli on löydettävissä osoitteesta:
piki.verkkokirjasto.fi/web/arena/kirjatti

Lisää kysymyksiä ja kommentteja voi esittää sähköpostitse: kristina.poldots@gmail.com

Olkaa hyvä ja vastatkaa kysymyksiin merkitsemällä oikea vastausvaihtoehto ja lisätkää tarkempi selitys tarvittaessa.

1. Onko lapsenne kertonut osallistuneensa Kirjatin Mediamatkan tilaisuuksiin kirjastossa?

Kyllä ☐ Ei ☐ En osaa sanoa ☐

2. Onko lapsenne kertonut, mitä hän oppi Kirjatin Mediamatkan avulla? Jos on, niin mitä?

Ei ☐

Kyllä, mitä?

Voit ohittaa tämän, jos edellinen vastaus oli *Ei*

3. Onko lapsenne oppinut Kirjatin Mediamatkan avulla jotain uutta? Mitä?

Ei ☐

Kyllä, mitä?

4. Oletteko katsonut lapsenne kanssa Kirjatin Mediamatkan peliä kirjaston nettisivulta (Piki) esim. kotona?

Kyllä ☐ En ☐

5. Onko lapsenne katsonut yksin Kirjatin Mediamatkan peliä nettisivulta (Piki) esim. kotona?

Kyllä ☐ Ei ☐ En osaa sanoa ☐

6. Tarvitseeko Kirjatin Mediamatka mielestänne parannusta? Minkälaista?

Ei ☐ En osaa sanoa ☐

Kyllä, mitä?

Olkaa hyvä ja palauttakaa täytetty lomake opettajalle.

(continues)

Survey for feedback and research on Kirjatin Mediamatka 2(2)

- Has your child told you about taking part of Kirjatin Mediamatka session in the library?
- Has your child told you what Kirjatin Mediamatka has taught him or her? If yes, then what?
- Has your child learned anything new with Kirjatin Mediamatka?
- Have you played the Kirjatin Mediamatka game on the PIKI website together with your child at home for example?
- Has your child played the Kirjatin Mediamatka game on the PIKI website alone at home for example?
- Does the Kirjatin Mediamatka game need any improvements? If yes then what?

Appendix 2. Presentation of the Vilpertin Mediakoulu application made to the client

by Kristina Põldots

Introduction

Vilpertin Mediakoulu is a media education application aimed to 3-5 graders, where children learn about computers, the Internet and how to use them in an effective and harmless way.

Vilpertin Mediakoulu is developed from the Kirjatin Mediamatka application, though its content and interpretation level are aimed to slightly older children. In Kirjatin Mediamatka, preschoolers learn very basic things about the media and its content is still corresponding for the children in 1-3 grades. As for in Vilpertin Mediamatka, the content is more mature and requires some basic experience, such as already knowing how to use a computer, tablet or smartphone and having an idea what the Internet is used for.

In Vilpertin Mediamatka, the goal is to teach children different methods of using the Internet and mobile devices in a way that would benefit them. Also resemblance with the traditional media is presented, such as reading a book or news can be easily done with a tablet or playing games with friends can be done through the Internet. The age limits and behavioral methods are also explained in fun and playful way.

Goal and improvements

The purpose of this application is to engage children in the learning process as much as possible. That is achievable by taking more advantage of the application's interactivity.

It is important to engage the children in both guiding them to make right decisions and making the decisions on their own throughout the application. Compared to the Kirjatin Mediamatka, the target group of Vilpertin Mediakoulu is old enough to make decisions on their own and to get more freedom of interacting with the application. The option could be to let children use the devices, where they use the application, either on their own or in pairs, instead of just sitting and following the teacher.

Without the possibility to use their own devices, teachers should interact with children during the presentation. The interaction is especially important after the use of the application. Based on the feedback of Kirjatin Mediamatka sessions and on the theory of effectiveness of repetition when learning, questions or quizzes should be presented after using the application with children. The sub-objective can be whatever, either testing what knowledge has been acquired or who has been the best at it, but the main objective of asking questions is to secure these new things that have been learned.

For example, after Kirjatin Mediamatka sessions, no actions towards confirming what has been learned, is taken. Children are taught to use painting program on a computer, first by showing and explaining what should be done, on screen. Then they are encouraged to start painting themselves, with teachers nearby to help if needed. Children are communicating with their peers about their workflow and show off their results. In a way repetition is taking place in this activity – it is shown what to do, children repeat it on their own and most of the time they do the same with their peers.

The result of all that is also shown in the feedback, when it was asked what children learned in Kirjatin Mediamatka sessions, almost 90% of answerers were: "They learned how to paint". Remaining 10% had the desired answers, such as: learned what is a computer or how to use Internet etc. The conclusion would be to treat these two activities – Kirjatin Mediamatka session and painting session either separately or find a way how to get the best results out of both. It is obvious, that the method used for painting session brought better results than the application session. So the suggestion for the improvement would be to find the best way to secure new things that have been learned either by having conversation sessions or asking questions after using the application.

Technicalities

Ideally, the application would be included on PIKI webpages and have its own section for children from 3-5 grades, where it would be available to play online. Another version would be downloadable for use at homes or schools offline.

Application interfaces and all the games are adjusted in addition to computers for use on interactive screens in the libraries and touchpad devices.

Also in Vilpertin Mediakoulu, different narrator voices are used for several characters, but with less talking and explaining. The reason for decreasing the use of voice explanations (compared to Kirjatin Mediamatka) is that children of this age are more used to and responsive to visual guidance.

Main character- Vilpertti

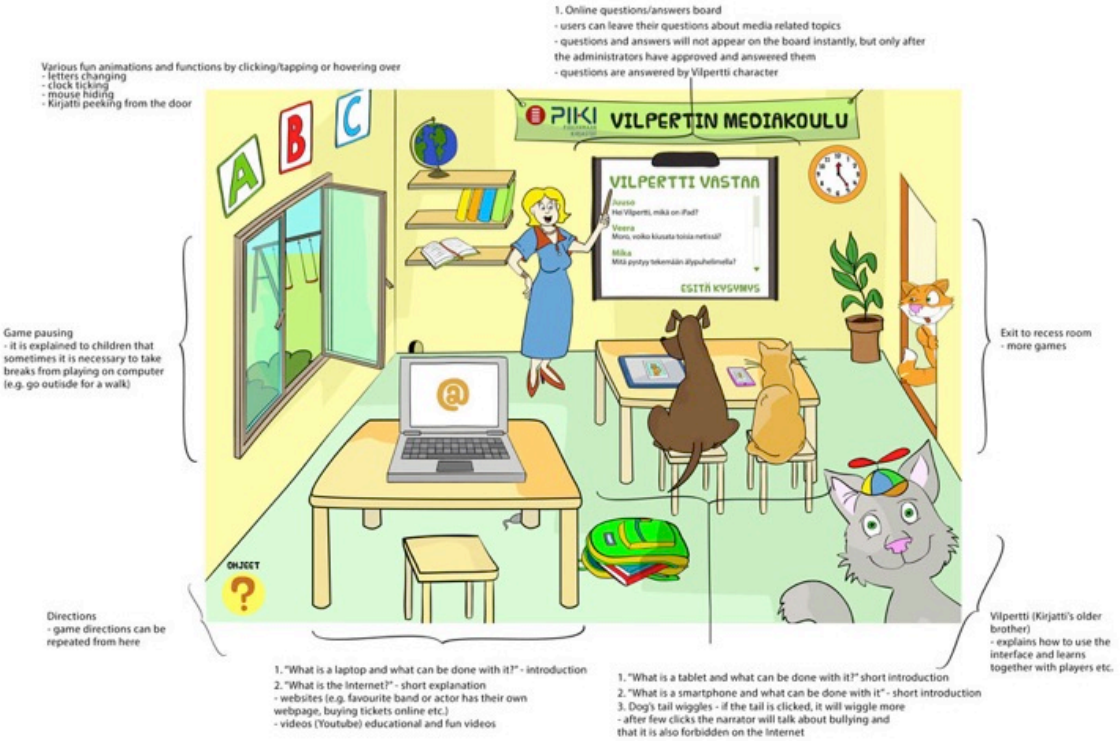
Main character- Vilpertti introduction

Vilpertti cat is Kirjatti's (main character from Kirjatin Mediamatka) older brother, who is a 9 year old primary school student.

Color:	Mixture of darker and lighter grey shades
Best friend:	Neighbor's dog Remu
Favorite food:	Herring and milk
Favorite activity:	Playing videogames
Favorite TV-show:	Katti, Karvinen

Main interface- classroom

Main interface- classroom image explanation



Main interface- classroom content explanation

Main interface is the first thing that is displayed when the application is launched. Vilpertti will act as a narrator for explaining how to use the interface. Although during different games, the narrator will be a "teacher", because Vilpertti is also learning new things together with the children.

Children can hover over different areas of the interface and choose different games to play. In addition, there are small hidden animations throughout the interface and the whole application that can be triggered by clicking or hovering over items with the mouse pointer.

In both main and second interfaces all the sections include either fun interactive animations or simple games to help to introduce or explain the educational content of the application. It is important to keep up children's concentration and interest in that way.

All the following explanations of different interface sections will be done either with animations or small games.

1. Laptop

- shortly introducing what a laptop is and how it is similar to desktop computer

1.2. Internet (becomes active, when the Laptop part has been viewed)

- describing generally what can be done on Internet
- explaining the meaning of different Internet webpages, for example, that their favorite band or actor can have their own webpage, with information about them. Or about web stores, where it is possible to buy train tickets etc.

1.3. Videos – YouTube

- shortly introducing the possibility to view different kind of videos online, taking YouTube as an example
- concentrating more on study and tutorial videos (since it is taking place in a classroom). Explaining the possibility to learn new skills through videos and online classes.

2. Tablet

- shortly introducing what a tablet is and how is it similar and/or different from a laptop
- example of iPad (since this is very familiar to children)

2.3. Smartphone

- shortly introducing what a smartphone is and how is it similar and/or different from a laptop and tablet
- example of iPhone (since this is very familiar to children)

3. Window – taking a break

- when hovering over the window, then the narrator reminds children that it is important to take a break from computers and TV from time to time and for example go and play outside
- when clicked on the window, the game will be on pause

4. "Vilpertti answers" board – Questions and Answers

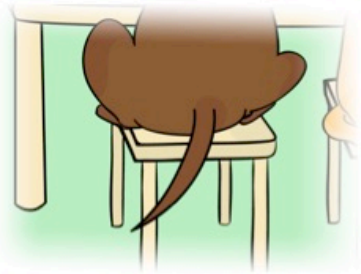
- the board can be used for submitting questions online about media which will be answered by Vilpertti (a media secretary from the library)
- media secretaries can choose if the questions are appropriate and only after answering and approving, these will be visible on the board
- questions can be submitted online, but the questions with answers are available to read also offline
- on the interface, only the name and the question of the visitor is seen, by clicking on those, interface zooms in and reveals also the answers

5. Narrator - Vilpertti

- Vilpertti introduces itself to children and explains how to use the interface
- from time to time Vilpertti will say some funny comments
- during the games Vilpertti is going to learn new things with children, and the actual narrating will be done by another (teacher) voice

6. Bullying – dog's tail

- dog's tail is animated to wag
- if it is clicked it starts wagging faster and more (while dog would make annoyed sound), which would make a child to want to click it again
- if it is clicked too many times, the narrator (teacher) will give a notice about bullying others
- in this section it is explained how it is appropriate to behave when using Internet, giving examples on real life behavior

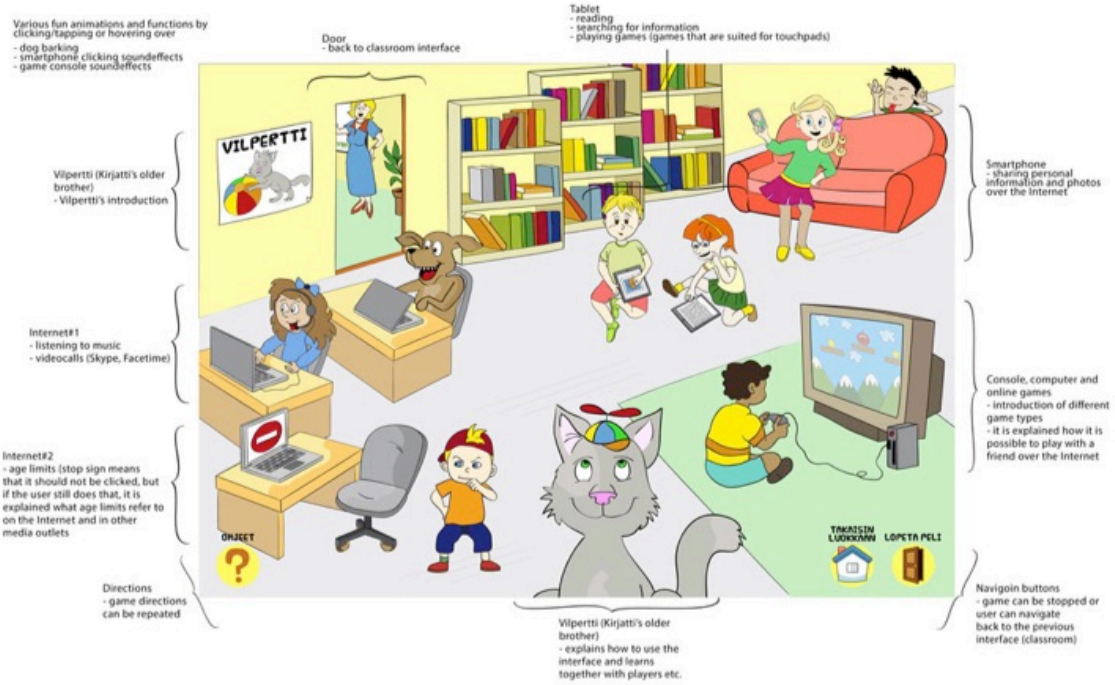


7. Door – Recess

- by hovering over the door, narrator asks children if they wish to go to a recess/ playtime
- by clicking on the door children proceed to next interface

Second interface- playtime

Second interface- playtime image explanation



Interfaces- choosing between games

Navigation
- hovering over different parts of the interface and clicking/tapping on them to proceed to the game

Various fun animations and functions by clicking/tapping or hovering over
- Vilpertti's eyes move the same way as the mouse pointer on the screen
- differen soundeffects are played when hovering over interactive parts of the interface (e.g. console game soundeffects when hovering over this part of the interface)

Second interface- playtime content explanation

Second interface is accessible from the main interface's door image section. The idea is that children can go from the "more serious" subjects in classroom, to playtime in the recess area.

Also at the second interface, Vilpertti will act as a narrator for explaining how to use the interface. Again during different games, the narrator will be a "teacher", explaining and introducing everything.

Also on the second interface children can hover over different areas of the interface and choose different games to play. In addition, there are small hidden animations throughout the interface and the whole application, which can be triggered by clicking or hovering over items with the mouse pointer.

Since this ise the "playtime" interface, the subjects are more fun. The meaning and explanation of advertisement and ads will be made – ads/commercials will appear in the middle of learning how to use internet on tablet or when playing games online on TV (meanwhile explaining what are ads, why are they appearing and what to do about them).

1. Vilpertti - intro

- interactive game-like introduction of Vilpertti. Vilpertti tells about himself, about his favorite food, books, friends etc.

2. Tablets

- concentrating more on what can be done with tablets
- characters on the image are positioned in front of the bookshelves with tablets, so it would be good to give comparison when teaching children, how they could read the books same way
- teaching how it is possible to find different kind of information through internet, using Google ad an example

3. Age limits

- explaining children about age limits on Internet and TV
- introducing necessary content symbols used generally in Finland for TV shows and games
- explaining how children have to be accompanied by parents if they are unsure about if they should visit some Internet sites or watch some TV shows
- explaining the importance of following the rules if the content is forbidden under certain age

- the red stop sign on the laptop screen shows that it is forbidden and if children click on it it is sais that they shouldn't have done that as an intro and then goes more into the subject
- also the image of a boy is showing that he would want to know what is there behind the stop sign and he is unsure if he should see it

4. Games

- this section is introducing and generally describing what video-, computer- ,internet- and console games are.
- introducing different genres of games – action, adventure, puzzle, combat, educational.
- different game genres are introduced to children as actual games, children can learn by playing the games themselves
- explaining the possibilities of multiplayer games and playing games online with other people

5. Smartphones – Social Media

- this section is introducing, what social media is about and how it is used – uploading pictures, viewing other people's profiles, writing status updates. communicating with friends etc.
- it is explained to children what is appropriate to reveal in social media and how it is suitable to behave there

6. Communication

- this section is introducing and describing how it is possible to communicate with others through chats, forums and video calls
- example of Skype calls
- example of Internet forums (people discussing about their favorite books)

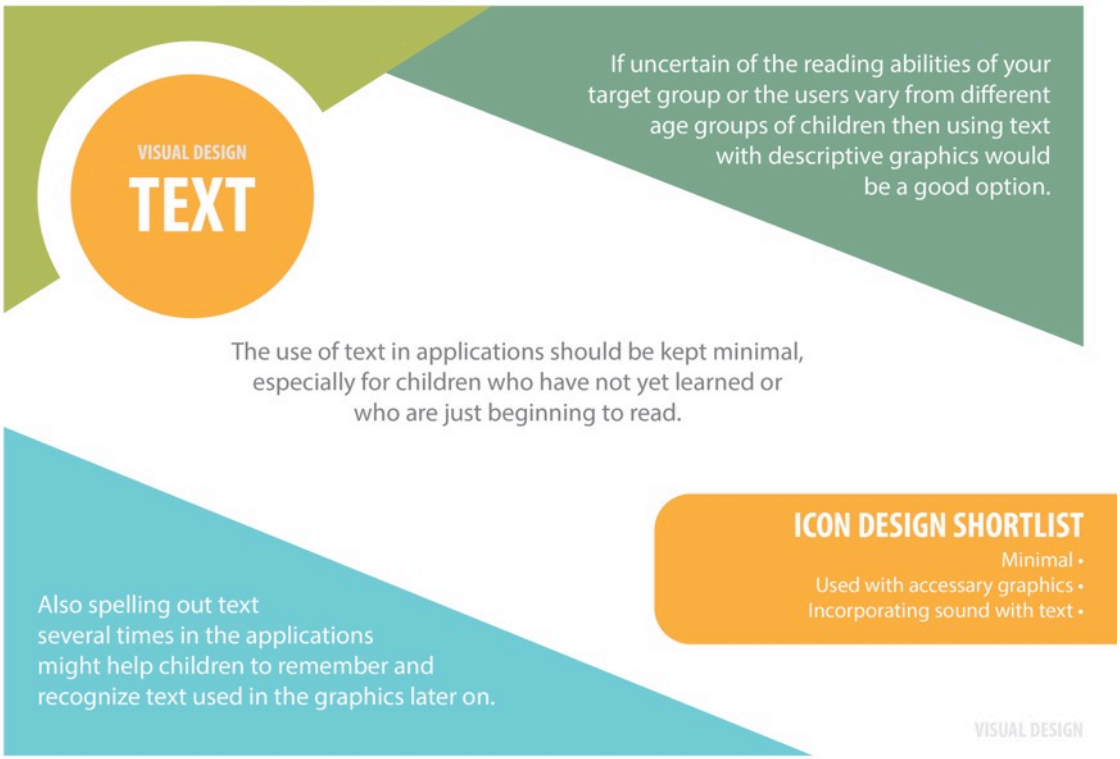
7. Classroom

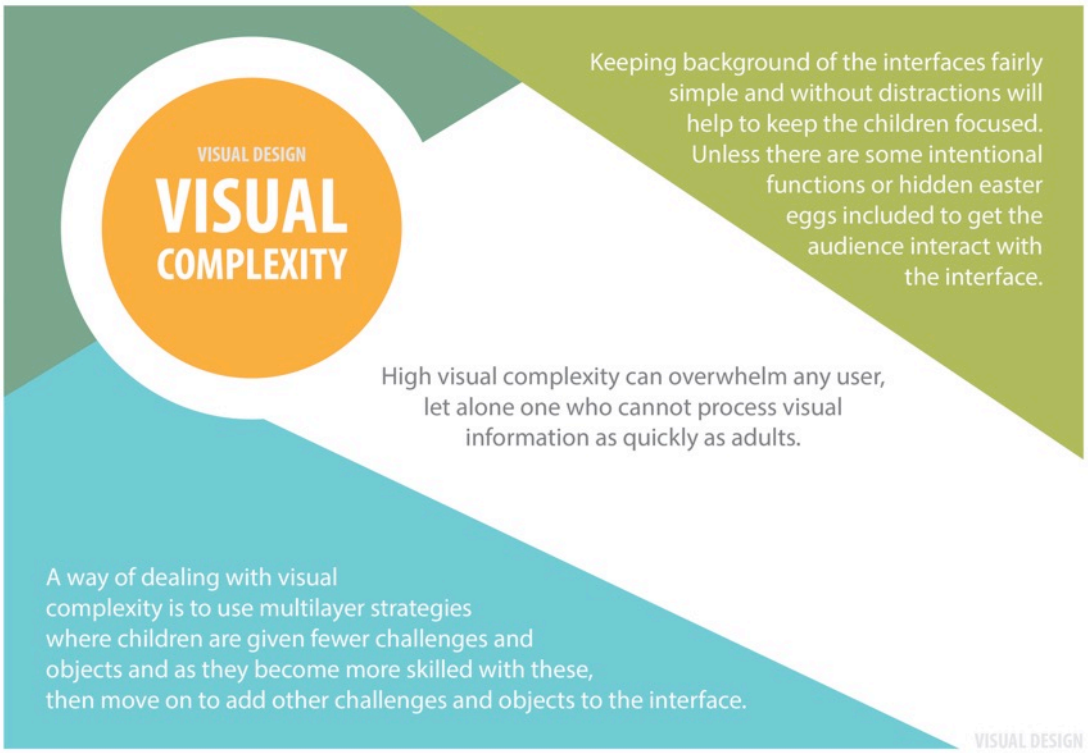
- back to classroom
- by clicking the door section the visitors are taken back to the first interface

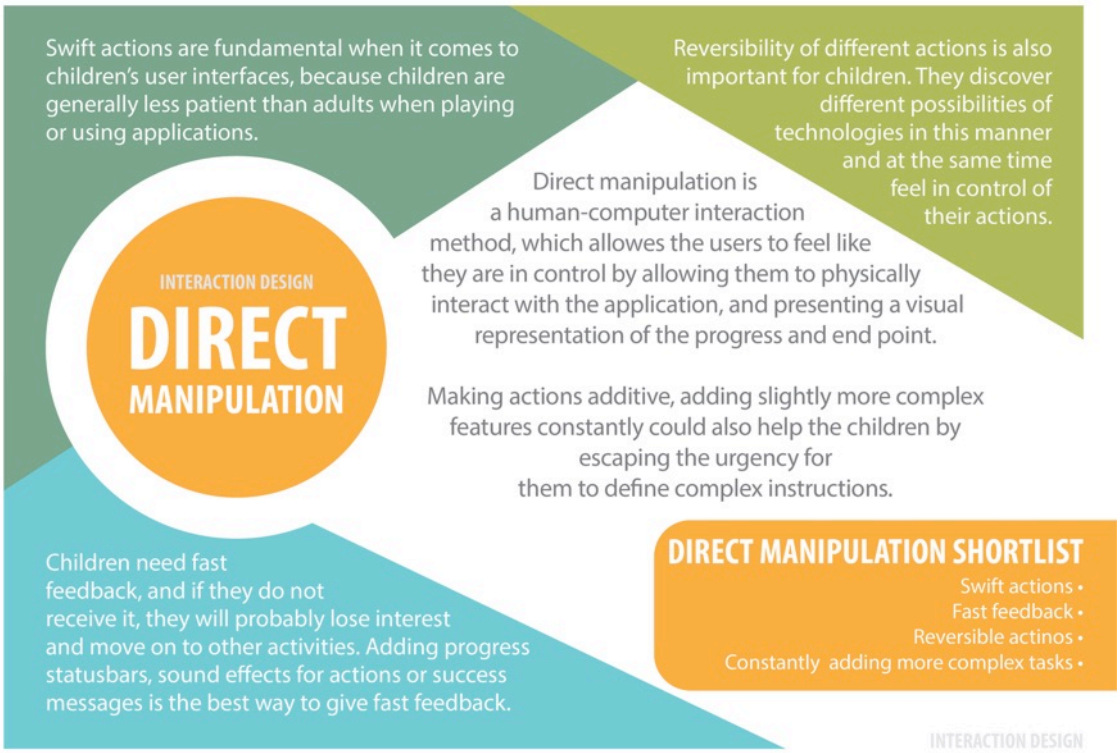
1. Narrator - Vilpertti

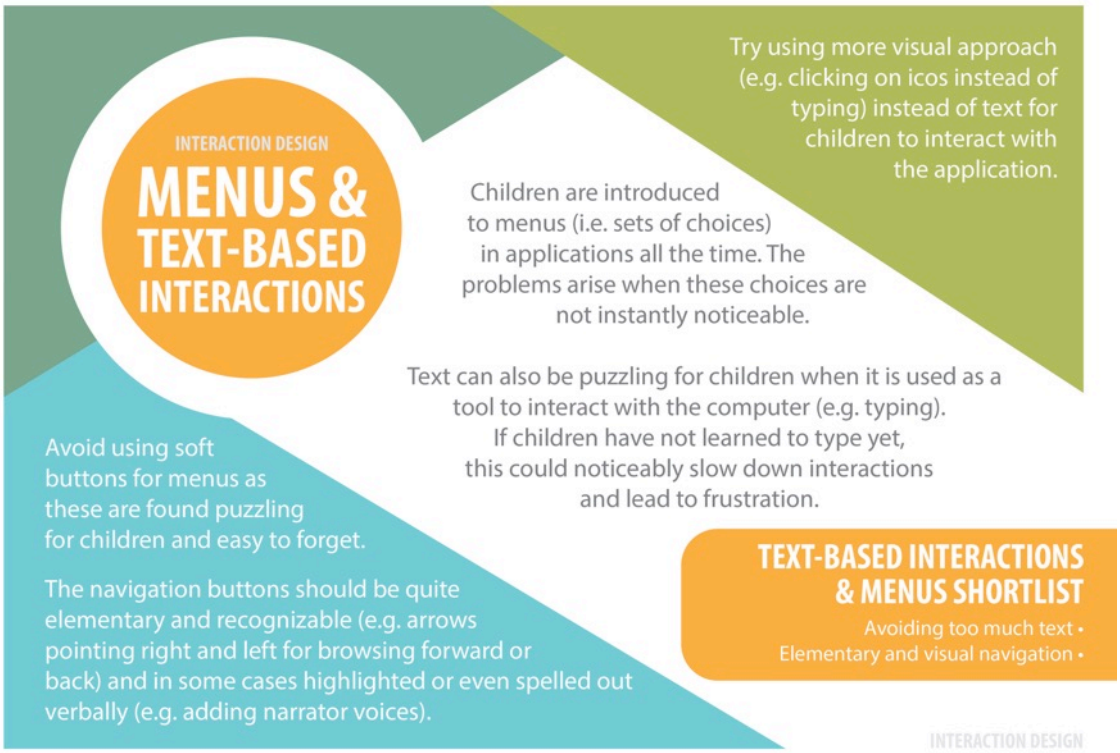
- Vilpertti explains how to use the interface
- from time to time Vilpertti will say some funny comments
- during the games Vilpertti is going to learn new things with children, and the actual narrating will be done by another (teacher) voice

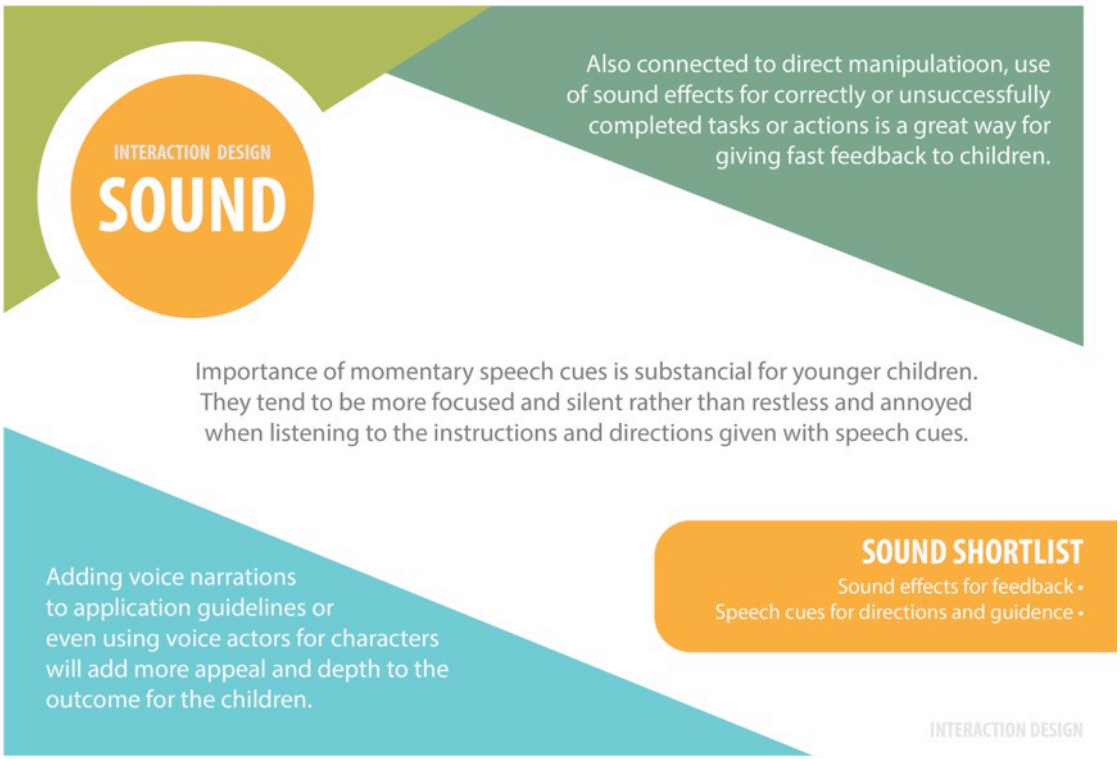
Appendix 3. Instructions manual for designing for children


VISUAL DESIGN
TEXT
If uncertain of the reading abilities of your target group or the users vary from different age groups of children then using text with descriptive graphics would be a good option.
The use of text in applications should be kept minimal, especially for children who have not yet learned or who are just beginning to read.
Also spelling out text several times in the applications might help children to remember and recognize text used in the graphics later on.
ICON DESIGN SHORTLIST
Minimal •
Used with accessary graphics •
Incorporating sound with text •
VISUAL DESIGN


VISUAL DESIGN
VISUAL COMPLEXITY
Keeping background of the interfaces fairly simple and without distractions will help to keep the children focused. Unless there are some intentional functions or hidden easter eggs included to get the audience interact with the interface.
High visual complexity can overwhelm any user, let alone one who cannot process visual information as quickly as adults.
A way of dealing with visual complexity is to use multilayer strategies where children are given fewer challenges and objects and as they become more skilled with these, then move on to add other challenges and objects to the interface.
VISUAL DESIGN


Swift actions are fundamental when it comes to children's user interfaces, because children are generally less patient than adults when playing or using applications.
Reversibility of different actions is also important for children. They discover different possibilities of technologies in this manner and at the same time feel in control of their actions.
INTERACTION DESIGN
DIRECT MANIPULATION
Direct manipulation is a human-computer interaction method, which allowes the users to feel like they are in control by allowing them to physically interact with the application, and presenting a visual representation of the progress and end point.
Making actions additive, adding slightly more complex features constantly could also help the children by escaping the urgency for them to define complex instructions.
Children need fast feedback, and if they do not receive it, they will probably lose interest and move on to other activities. Adding progress statusbars, sound effects for actions or success messages is the best way to give fast feedback.
DIRECT MANIPULATION SHORTLIST
Swift actions •
Fast feedback •
Reversible actinos •
Constantly adding more complex tasks •
INTERACTION DESIGN


Try using more visual approach (e.g. clicking on icos instead of typing) instead of text for children to interact with the application.
INTERACTION DESIGN
MENUS & TEXT-BASED INTERACTIONS
Children are introduced to menus (i.e. sets of choices) in applications all the time. The problems arise when these choices are not instantly noticeable.
Text can also be puzzling for children when it is used as a tool to interact with the computer (e.g. typing). If children have not learned to type yet, this could noticeably slow down interactions and lead to frustration.
Avoid using soft buttons for menus as these are found puzzling for children and easy to forget.
The navigation buttons should be quite elementary and recognizable (e.g. arrows pointing right and left for browsing forward or back) and in some cases highlighted or even spelled out verbally (e.g. adding narrator voices).
TEXT-BASED INTERACTIONS & MENUS SHORTLIST
Avoiding too much text •
Elementary and visual navigation •
INTERACTION DESIGN


INTERACTION DESIGN
SOUND
Also connected to direct manipulatioon, use of sound effects for correctly or unsuccessfully completed tasks or actions is a great way for giving fast feedback to children.
Importance of momentary speech cues is substancial for younger children. They tend to be more focused and silent rather than restless and annoyed when listening to the instructions and directions given with speech cues.
Adding voice narrations to application guidelines or even using voice actors for characters will add more appeal and depth to the outcome for the children.
SOUND SHORTLIST
Sound effects for feedback •
Speech cues for directions and guidence •
INTERACTION DESIGN