Gender differences in children's creative game play

Bieke Zaman
Centre for Usability Research
Catholic University of Leuven (BE)
Bieke.Zaman@soc.kuleuven.be

David Geerts
Centre for Usability Research
Cahtolic University of Leuven (BE)
David.Geerts@soc.kuleuven.be

ABSTRACT

A new interactive Movie Studio for children was tested on its usability in a usability lab, to maximize the user's creativity and game satisfaction. The results of the tests revealed not only critical usability hits, but also an interesting gender gap in the interaction style. First, the mean time spent in the different phases of the Movie Studio was longer for girls than for boys. Consequently, the mean total of visits in each phase was higher for boys than for girls. Further, boys more often used the function tools than girls. Although girls watched the intro and tutorial video clip approximately as many times as boys, girls on average spent more time watching these clips than boys. Finally, girls built dialogs more often between their actors than boys. In this paper some possible explanations will be given. Further research must complete, explain and verify these gender differences.

Keywords

Games, gender differences, children

INTRODUCTION

Most game designers develop games for the target group of their own age. Consequently, they tend to rely on their own knowledge, experiences and interests when designing games. The need for further research becomes evident when game developers plan to develop games for children [2] since they have their own culture, skills and complexities [4]. Adults often suppose that they can assess children's expectations because they too were once a child. By growing older though, adults lose the feeling of being a child, including the cognitive, physical and emotional developments as well as the (media) context in which they grew up [2]. Consequently, the development and evaluation of user friendly software for children needs an adapted research method to involve children in the design and evaluation process. This approach has recently been researched in the Human-Computer Interaction domain. It goes without saying that usability research with children (by doing user tests) and for children (by developing child friendly devices) differs from research with and for adults.

This short paper will describe how we evaluated a new creative game for children called the Movie Studio ('Filmstudio' in Dutch). Although the research was focused on the usability and likeability of the game, we found some remarkable gender differences which will be further explained in detail.

INTERACTIVE MOVIE STUDIO

The usability of a new Flemish interactive Movie Studio was evaluated before it was launched commercially. The Movie Studio is part of a larger 3D-game, KetnetKick. KetnetKick is a multimedia application for children between 6 and 12 years old. The innovative product is a 'PCtoTV' project of the public broadcaster of the Flemish community in Belgium, VRT.

The Movie Studio allows children to make a movie in six phases. In the first phase, the users make up a title and give in the credits. In the second phase, children create the set of the movie by selecting background, foreground, weather, music and stage properties. Then, the users can place the different elements in the set, change their height, mirror them, etc. In the fourth phase, the users choose their actors by making decisions about gender, age, race, clothes, ... The fifth phase concerns the real story making process. Users can create movements, text balloons, emotions, … to build up their story. In the last phase, different scenes can be edited into one movie. The Movie Studio is of great value because of two reasons. On the one hand, the Studio allows children to express their creative skills. On the other hand, children can send their movie to the public broadcaster for children so that their creation can be seen on television.

METHOD

The Movie Studio was tested in a usability lab by children in presence of two researchers in

order to evaluate the usability and likeability of the game.

The aim

The main aim of this research was to maximize the user's creativity and game satisfaction as well as to prevent frustration caused by encountering usability problems.

Usability research of games differs from research of productivity applications. As stated by Pagulayan et al. [12] "the goal of iterative usability testing on games is to reduce the obstacles to fun, rather than the obstacles to accomplishment".

The setting

The test took place in a stationary usability lab. This lab is divided by a one way mirror into two rooms: a control room and an observation room. The observation room is arranged as a living room (with armchairs, a side table, a television, a desk, etc.) so that the test users would experience the new application in a situation that is close to "real time experience". Although the room is called 'lab', it does not give the feeling of a laboratory nor a workplace. Instead, the room represents a cosy, homelike place. One researcher accompanied the test child in the observation room while a second researcher sitting in the control room, recorded and logged the sessions.

Test users

The number of test children who are invited in the usability lab, depends on the game that is evaluated and/or the research focus points. We prefer to invite maximum three children at a time for practical reasons (observation infrastructure, the researcher's capability of concurrent logging of several users).

During the 9 user tests of the Movie Studio, 13 children between 5 and 12 years old (6 boys and 7 girls, mean age: 8.6) were confronted with the application. Each session lasted approximately one hour and a half. The children were given the chance to explore the Movie Studio in their own pace.

Although the literature states that children lose concentration after approximately 45 minutes [9], we found that user tests can last up to one hour and a half. This can probably be explained by the fact that games are tested, and not productivity applications. When children are observed with a game they played several times before, we found that children lose interest and concentration after one hour.

Procedure

The set up of the user test of the Movie Studio is a structural usability test with the exception that no predefined tasks are given since this was irrelevant to evaluate the game. Dumas and Redish define five characteristics of this methodology [5]:

1. The primary goal of usability testing is to improve the usability of a product (…).

2. The participants represent real users.

3. The participants do real tasks.

4. The researchers observe and record what participants do and say.

5. The researchers analyze the data, diagnose the real problems, and recommend changes to fix those problems.

During the user tests of the Movie Studio, the think-aloud method and the active intervention method were combined. Preliminary research of Van Kesteren et al. [15] suggests that the active intervention method is the most effective usability evaluation method to elicit verbal comments from children. Children also provided useful comments in the thinking aloud sessions. Work by Donker & Markopoulos [3], has shown that children are able to provide a running commentary during interaction. The results of their study reveal that more usability problems are found using the think aloud method than with a post-task interview or a post-task questionnaire. For our research, we combine the think-aloud method and the active intervention method.

Although the children were asked to 'think out loud' while testing the Movie Studio, their nonverbal reactions were also taken into consideration. Thinking out loud is very unnatural and can make children feel uncomfortable. Because children are not familiar with think-aloud, they become easily quiet. That is why the researcher 'actively intervened' by asking relevant questions during task performance. Further, children are inclined to answer what they think the adults like to hear. This explains why the children's behaviours, facial expressions, etc. were recorded on video. Nonverbal communication often reveals more information than verbal information.

RESULTS

Gender differences

The results of the user tests with children revealed not only critical usability hits but also an interesting gap in their interaction style with the Movie Studio. These gender differences surprised the researchers, who did not focus their research on this topic. Further research is needed to explain and verify the findings.

Mean time spent in each phase

First, the mean time spent in the different phases of the application was longer for girls than for boys. It took the girls twice as long to make up a title, to choose the setting and to create the actors by making decisions about gender, age, race, clothes, etc. Consequently, the mean total of visits in each phase was higher for boys than for girls.

A difference in attention span is one possible explanation for the observed gender differences. One can suppose that girls stay focused longer than boys or that boys will turn workflow into more action oriented activity [13]. Brenda Laurel, a pioneer in developing virtual reality and researching the opportunities of games for girls, confirms these findings. She found that boys like to demonstrate their mastery and speed in game play [1].

The use of function tools

A second gender difference concerns the use of function tools like the actor menu (for creating movements, emotions, text balloons, etc.) or the time line (for managing the selected animations) which boys used more often than girls.

This gender difference is in favour of the supposition that boys seem to be more action oriented than girls [13].

Watching the intro & tutorial video clip

Although girls watched the intro and the tutorial video clip approximately as many times as boys, girls on average spent more time watching these audio-visual clips than boys. Girls on average watched the tutorial 7 minutes whereas boys only watched 4 minutes, 30 seconds. The tutorial began with an explanation of every step that can be taken to make a movie and ended by a presentation of a movie. Most of the boys were not interested in this presentation because of their eagerness to continue the creation of their movie. One boy even interrupted the tutorial after 50 seconds because he learnt something new that he wanted to try out immediately. Girls on the other hand were not annoyed to wait and see the tutorial until the end.

Again, one can suggest that boys are eager to proceed on their actions rather than to keep listening to the clips. Nielsen [11] already found that girls where not annoyed to read relatively long text instructions on web pages. Another possible explanation can be the attitude towards risks and failures. Boys learn by doing whereas girls first want to know how something works before testing it. Girls do not like to take risks. This may not be misinterpreted by generalising that girls do not like surprises [13].

Building dialogs between the actors

Finally, girls built dialogs more often between their actors than boys. Girls on average initiated 9 times a dialog whereas boys approximately did this 7 times.

A possible explanation can be found in studies that have shown that girls like complex social interactions and that they are fascinated by building relationships between characters. Another explanation comes from the attitude towards computers. Boys see their PC as an enemy that must be defeated whereas girls see the computer as a tool whereby things can be created. In other words, the attitude of boys towards computers is competitive and destructive. By contrast, the attitude of girls is communicative and artistic. This explains why women and girls prefer games with a narrative [14] [13] [8] [1].

CONCLUSION

In conclusion, the user testing of the new Movie Study has shown that on the one hand non-violent but creative games appeal to both genders. On the other hand some interesting gender differences exist that need further research to be explained and verified.

FURTHER RESEARCH

In further research, the five differences mentioned in this paper must be verified, completed and explained. First there is the children's game pace. Do boys really perform more actions during game play than girls? Secondly, the sought purpose must be investigated to confirm whether boys indeed prefer action and a win or lose purpose and whether girls indeed prefer to build up social interactions and relationships. The communication styles are a third focus point. Then the difference in the attitude towards the computer must be analyzed. Finally the differences in attitude towards risks and failures must be investigated.

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REFERENCES

1. Beato, G., 1997: "Girl Games. Computer games for girls is no longer an oxymoron." WWW [URL].http://www.wired.com/wired/5.04/es_girlgames_pr.html (visited March 18, 2005).
2. Bruckman, A.,& Bandlow, A., 2003: "Human-Computer Interaction for Kids." In: J. Jacko and A. Sears (Eds). *Handbook of Human Computer Interaction,* London: Lawrence Erlbaum Associates Inc., pp. 428-440.
3. Donker, A., and Markopoulos, P. A comparison of think-aloud, questionnaires and interviews for testing usability with children, in: Faulkner, J.Finlay and F.Detienne, (Eds.) *People and Computers XVI- Memorable Yet Invisible, Proceedings HCI 2002,* Springer, 305-316.
4. Druin, A., 1999: "The Role of Children in the Design of New Technology". In *Behaviour and Information Technology (BIT)*,Vol. 21(1), pp.1-25.
5. Dumas, J.S., & Redish, J.C., 1999: *A practical guide to usability testing. (Revised edition).* Portland, OR: Intellect Books, p. 22.
6. Egloff, T. H., 2004: "Edutainment: A case Study of Interactive CD-RO Playsets". In *Computers in Entertainment*, Vol. 2(1), pp. 1 - 22.
7. Fabricatore, C., Nussbaum, M., and Rosas, R., 2002: "Playability in Action Videogames: A Qualitative Design Model". In *Human Computer Interaction*, Vol. 17 (4), pp. 311-368.
8. Gorriz, C. M., & Medina, C., 2000: "Engaging girls with computers through software games". In *Communicatons of the ACM*, Vol/ 13 (1), pp. 42-49.
9. Hanna, L., Risden, K., and Alexander, K. Guidelines for usability testing with children. *Interactions 4, 5* (1997), 9-14.
10. Malone, T. W., 1982: "Heuristics for Designing Enjoyable User Interfaces: Lessons from Computer Games". In *Proceedings of the 1982 conference on Human factors in computing systems*, New York, USA.
11. Nielsen, J. , 2002:"Kids' Corner: Website Usability for Children" In *Jakob Nielsen's Alertbox* (useit.com).
12. Pagulayan, J. R., Keeker, K., Wixon, D., & Romero, R.L., 2003: "User-centered desing in games". In: J. Jacko and A. Sears (Eds). *Handbook of Human Computer Interaction*, London: Lawrence Erlbaum Associates Inc., pp.883-904.
13. Ray, S. G., 2004: *Gender Inclusive Game Design. Expanding the market.* Massachusetts: Charles River Media.
14. Tannenbaum, R. S. & Badagliacco, J. M., 2000. "Multimedia and Gender", in*Ubiquity*, Vol 1(1), art. 4, New York: ACM Press.
15. Van Kesteren, I. E.H., Bekker, M. M., Vermeeren, A. P.O.S, & Lloyd P. A. , 2003: "Assessing Usability Evaluation Methods On Their Effectiveness To Elicit Verbal Comments From Children Subjects". In *Proceedings of the 2003 conference on Interaction design and children*, Preston, UK.