

YOUNG CUSTOMER IN THE INTERNET AND USABILITY OF WEB PAGES

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Summary: This paper is an attempt to create a set of guidelines which will contribute to achieving better results and identify additional problems during usability tests with children. Young Internet users represent a large and very critical group, and unfortunately Polish literature lacks guidelines on the design of the websites for young consumers. There exists also an information gap in the guidelines associated with conducting usability tests with children and this paper attempts to supplement it by setting a set of guidelines.

Keywords: usability, designing web pages for children, usability criteria, human-computer interaction.

What works for adults will not necessarily work for children,
so HCI research must develop usability guidelines
that are appropriate for children.
Kori Inkpen, 1996

1. Child in the Network

Internet users are becoming younger and younger. According to the report “Polish children on the Internet. Hazards and security on the basis of data for the EU”, the young man uses the Internet every day: 96% of Polish children use the Internet once a week, 72% daily and 24% 1-2 times a week [23]. As many as 12% of underage Internet users are under 16 years of age. Group of children under the age of 13 are 9% of the Internet users, of which 65% were boys [24] (Fig. 1).

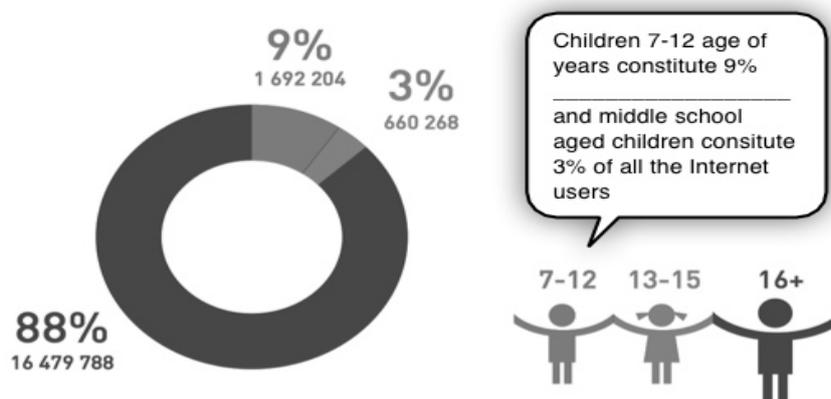


Fig. 1. Young Internet users [24]

The area of interest of children who spend time in the network is mainly entertainment - games, social networking, and cultural information (Fig. 2).

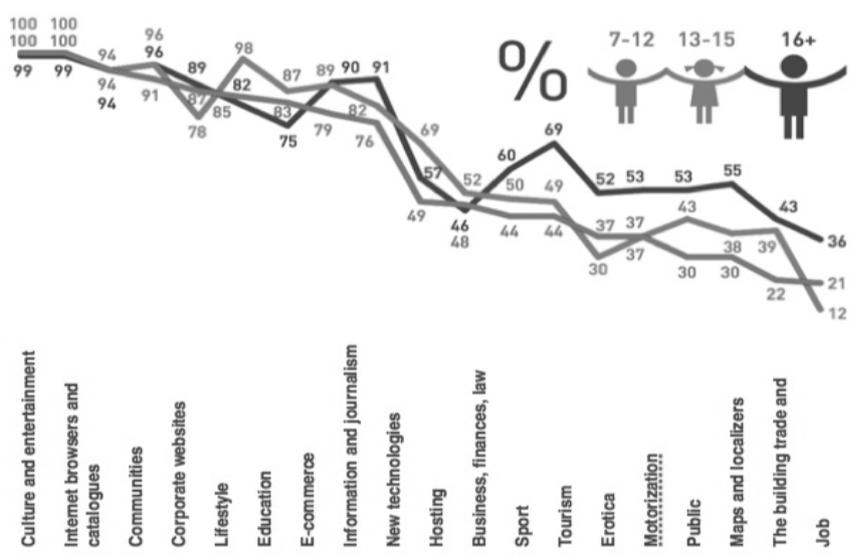


Fig. 2. Interest areas of young Internet users [24]

Fig. 2 shows that children are a significant group of Internet users - are consumers in the network. Consequently, more and more websites are targeted at this group of users. As the young users have little experience in using the Internet, it is important that the web pages they visit should be useful and take into account their mental models and stages of cognitive, emotional and social development. To design a web page which target user will be children, it is necessary to carry out a series of usability tests, during which the research group will be just children and to use design guidelines which take into account abilities of a young man. It is very important because children are very critical and if a web page does not meet their expectations or the use of it is complicated, then they leave it very quickly [3]. Moreover, according to Silica Larkin, children understand very well what the usability is and can evaluate it [15]. Because in Polish literature exists an information gap in the guidelines associated with conducting usability tests with children, this paper attempts to supplement it.

2. Child - the consumer - market research

According to the Law on Ombudsman for Children, each person can be called a child from the moment of conception to the age of 18, i.e. reaching one's majority. According to the ESOMAR Code, a child is someone under 14 years of age and 14-17 years age group is referred to as young people. These definitions can be applied in the absence of specific definitions in the country [22].

During research with children (marketing, usability, etc.) we should be aware that minors are citizens whose rights have been delegated to parents. Therefore it is necessary to observe the following rules:

- Express written consent of the child's participation in the research,
- The presence of a parent during the study (children aged 4-7 years),
- Creating the conditions in the place where the examination will be carried out (friendly, safe environment),
- Setting the time frame of the research which is appropriate for the child's age category,
- Informing the child about the test schedule,
- Adjusting the research pace and action for mental and physical condition of the child [20].

According to the Code of ESOMAR (European Society for Opinion and Marketing Research) research involving children should take into account the following factors:

- Welfare of the child (the study is to be pleasant and interesting experience),
- The rights of parents or legal guardians of the child (they must be confident that during the study, all the rights and interests of the child are observed),
- Position of the researcher (providing protection – legal tools for personnel carrying out the research in case of accusations, misunderstandings concerning inappropriate contact with children),
- Other public authorities and opinion leaders, who must have the assurance that the tests are carried out at the highest level, and the children are not exploited in any way [20].

Moreover, according to the ESOMAR Code the following rules should be followed: Children under 14 years:

- If the test is carried out in schools or other institutions (so-called protected area), you must obtain permission to carry out research from the person responsible for the place,
- If the test is carried out in a public place or in an orphanage, then the parent's consent is required or of the person entrusted with custody of the child,
- A request for permission to conduct research with a child, it is necessary to provide information with all issues related to the research, including an explanation of the need to ask the child such sensitive questions. The person conducting the test may be invited to present a document confirming his or her identity,
- The person responsible for the child should be present during the test (does not need to reside in the same room),
- If the child's task will be testing a product, then the person that is responsible for the child should have the right to become acquainted with the product [22].

Children and young people (the definition of a child and young person by ESOMAR has been presented earlier):

- If the child or young person tests a specific product (toy, food, etc.) we must make sure that it meets all safety rules and legal principles (e.g. children cannot consume alcoholic beverages, parents may not agree to participate their child in the test because of their views or beliefs relating to this product). The person which carries

out the tests may require the supplier of the product to provide a written statement in which he undertakes to incur liability in the event of adverse side effects caused by this product,

- During carrying out the tests we should take into account the level of maturity of the child (e.g. in the case of some computer games the child may feel anxiety and fear) [22].

Patrycja Venulet has proposed the following methodology for conducting qualitative research with children:

Children aged 4-5 years:

- Individual interviews,
- The presence of a parent.

Children aged 6-9 years:

- Interviews in pairs or groups (5-6 people)
- The group should be appropriately matched for age and gender.

Children aged 10-12 years:

- Focused group interview.

And a methodology for carrying out quantitative research:

Children aged up to 7 years:

- Asking children about the facts at this age is somewhat difficult,
- Making accurate assessments is difficult,
- Parents play an important role in the recapitulation of test results.

Children aged 7-12 years:

- The interviews with questionnaire forms [20].

As a result of literature research and their own experience, the authors of this paper have developed a list of guidelines, which applying allows performing website usability tests with children in an effective manner and in accordance with the ethical standards. The results of the study are presented in the next section.

3. Website usability tests with children – guidelines

3.1. Introductory information

Researchers who intend to carry out usability tests with children, need to be aware of their cognitive development. Jean Piaget distinguished children's cognitive development phases, taking into account their age:

- 2-4 years: preconceptual thinking. This is a phase in which only a child learns to interact with other people, called objects. Children of this age are able to concentrate for about 8-15 minutes and have not yet fully developed motor skills [7];
- 4-7 years: intuitive thinking. Although children of this age are able to make verbal contact, they have a problem with understanding many issues. The investigator must therefore take into account the above limitations and adjust the level of their statements and questions to the level of the child - direct questions, no suggestion, short time of tests. At this stage of child development research the focus groups and qualitative interviews turn out to be the best solutions;

- 8-11 years: the real operations. Children already can read and write, expect a large stimulation during the test (fun, games, teaching aids), also exhibit a tendency to fantasize. In this age group, surveys, structured interviews or focus groups work well;
- 11-15 years: formal thinking. Children are already members of the community - are able to negotiate, think formally, abstractly and logically. They expect social acceptance, which is why it is important that during the test there is a nice atmosphere. They have no problem with making contact with strangers [2].

Jakob Nielsen suggests carrying out research in pairs in the case of children aged 6-8 years (thanks to the interaction that occurs between children it is possible to obtain very interesting feedback) and individual sessions with children under 6 years of age and over 8 years of age [3].

We should also pay attention to the computer skills of children in the given age groups: less than 2.5 years:

- Lack of ability to handle mouse, keyboard, or touchpad [9],

7-11 years:

- Browsing the page content,
- Ability to work in a group before a computer screen,
- Recognition of metaphors [8],

more than 14 years:

- The abilities at the level of adult human [9].

3.2. Preparation of test

- Preparation of the laboratory: setting the correct height of chairs, microphone, etc. Obtaining better results of the tests is possible if the tests take place in an environment that is familiar to the child (his or her room, kindergarten, school, etc.). The test may also be arranged in such a way that the child at the first visit only see the lab and get to know all the employees, whereas the real test will take place during the second visit. Researchers can also make the laboratory to be more child-friendly - colored posters, toys, etc. However, there is a danger that the above mentioned items will be distracting, thus it is important to maintain a compromise;
- First meeting: the child's parents play the essential role during the first contact with the researcher. Because they are the authority for the child, it is worth to ask them before the first meeting to presented the child the person who will be moderating the tests. In this way the researcher will increase his or her credibility. However, to not impose their opinion, the parents should not be present during implementation of the survey - they should not be present in the same room;
- Creating an appropriate atmosphere (brief conversation with the child on issues not related to the objective of the tests, for example, about his hobbies, favorite toys, etc., Establish partnership relationship with the child). The investigator should be dressed informally;
- Parents must give written consent for participation in usability tests of a child (taking pictures during the test and recording video, gratuities should also be considered). A child can be said that the tasks performed during the study are strictly confidential;

- Explanation of the aim of the research, how it is performed and verification of the information – it is worth to ask the child to communicate in its own words what is the purpose of the study and what it will have to do. The child should also have the opportunity to question a moderator. In addition, it must be explained to the child that he would not be evaluated or tested in any way. When testing prototypes child may be disappointed that the study does not apply to finished product. Then you need to explain to it what it is and why testing a prototype of the product in this phase is extremely important;
- It is worth to present the equipment used during the test, the laboratory, present observatory (if any), that the child is not distracted during the test;
- Adequate preparation of tasks: taking into account gender of the child and his interests, opportunities resulting from its development, such as small children cannot read, older already have this ability, and teenagers scan the text. In addition, the objectives of the task should be flexible. Each child must perform tasks in a different order, because the fatigue and boredom can affect the manner of their implementation;
- If during or after the execution of the study child will be able to take advantage of refreshments, you must first consult a parent of a child or his guardian and obtain information about possible child's diet or allergies occurring.

3.3. Performing tests

- Initial test of ability to the child: for preschool-aged children, they may have problems adjusting to the equipment with which they will use during the test (e.g. different from the one that it has at home). Therefore, you should first check how the child copes with e.g. the mouse (pointing given objects, drawing, dragging, etc.), mouse pointer movement speed can be also slowed down. However, the child should not be taught handling the computer hardware [9]. To familiarize the child with the new hardware, we can also perform some kind of warm-up - moderator points the finger at some place on the monitor and the child moves the mouse pointer over the place;
- Take short breaks, children get bored quickly. It is worth to consult with the child's parents on the need for a toddler to use the toilet;
- Feedback: during the tests it is worth to motivate the child to actively participate by commenting on each of its positive steps, for example, “you're doing well”. It is also very motivating approach when the researcher tells the child that it is an expert who will teach all those present in the laboratory using the test site [3];
- Reading the nonverbal signals: children often do not express their feelings directly, so you should particularly pay attention to such behavior as the drilling, yawning, laughing, sighing, etc.;
- Verbal contact: if the child is confident and very communicative, you can ask them to think aloud while using the test page. The researcher can also ask the child what are his feelings when it uses the site. Use language should be suited to the child development (e.g. do not use technical terms, sarcasm);
- If the couple of children is involved in the study, no questions should be directed to only one of them, you cannot favor one child;

- To observe the natural behavior of the child, the investigator using a clever excuse should leave for a moment the laboratory during the tests;
- Demotivating factors: offering children during the study sweets, drinks, giving them the time frame for the task (pre-school children are able to take part in a study lasting up to 30 minutes, the older children - one hour [9]), keeping notes in a way visible for the child, etc. If the child is distracted and clearly shows their boredom, then the researcher can gently admonish or inform it that the test ends, for example, for 5 minutes;
- In case of providing guidance for the children by loudspeakers (moderator is not present in the laboratory), speak soft, calm and warm voice;
- The moderator should always control whether the child understands all the concepts, if he knew words, whether he knows what is shown at pictures, etc. Furthermore, if a product-specific website is tested, for example, associated with a series of books about Harry Potter, the moderator should be familiar with the topic / issue (in this case, the content of the book) [15];
- If the child is very shy and unable to stay in the lab alone with a moderator, then the parent's presence will be helpful. The parent, however, should not be located within sight of the child and should not enter into interactions with him. Very small children can sit on their parents' lap during the test [9]. Parents residing outside the laboratory during the study should have the opportunity to observe the child in another room;
- If the child came to the place where the examination will be held with both parents, and other accompanying persons (siblings, relatives, friends), then this person should be present during the test in another room;
- Children often use the computer or the Internet in the presence of parents, relatives, etc. and ask them questions about functionality, taking the next steps, etc. If this situation occurs during the test (the moderator will ask the child how to perform a task), then the conversation should be moderated to let the child solve the task by itself, e.g.
 - child: Where should I click?
 - moderator: And which element looks that you can click on it? [9];
- Do not ask the child whether he wants to perform some task, because it can give us the negative answer. Instead, you should encourage the child to do something, for example, I need your help ..., It is high time that we have tested how it works ... etc. [9]. Children willing to provide assistance to others, so to encourage them to act a moderator may begin to perform the same tasks at the same time making many mistakes and saying that it is too difficult for him. Then there is a likelihood that the child takes the initiative and show us how we should do something [9];
- In the case of children who are just learning to read, we can help them by reading some of the labels appearing on the website [9];
- In the situation where a researcher is unable to establish contact with the child and carrying out the test poses many difficulties, then the test should be stopped;
- Conducting usability tests in groups (maximum of six children in the case of teens and a group of three people in the case of babies), it should last up to 2 hours, but the script should be prepared only for an hour [13];
- In the case of usability tests of computer games, it is recommended to perform testing in pairs. The test can be prepared so that the child can separately evaluate

the rules of the game and its artistic value. Pairs of users aged 13-14 years identified more usability problems, if young participants already knew each other [23].

3.4. Completion of survey

- Children often depends on the acceptance of adults, thus more important than verbal communication are non-verbal signals sent by them (laughter, boredom, yawning, drilling, cries of admiration, etc.). Therefore, the test moderator must be keen observer;
- To help children express their views and feelings about the test service, website, etc., it is helpful to use sticky notes, representing emoticons corresponding to different emotional states (laughter, sadness, yawning, etc.). The child will then be able to express their opinion by choosing appropriate cards (Picture Card Methods, [12], Figure 3). Such assistance may also be prepared in the form of several steps in the vertical scale [9]. Other useful materials: crayons, paper, sticky notes, plasticine, glue, scissors, etc. - especially important when working with children under 7 years of age [13];
- When the test is finished, child must be told that the performed work is vital and will help improve the product so that other children are able to use it without a problem;
- Apart from financial reward handed to parent, the child may also be obtained from the investigator gratification in the form of toys, a cinema ticket, a tester certificate, etc. [9].



Fig. 3. Cards with emoticons to help children express feelings and opinions [12]

4. Summary

Currently, children spend more and more time in front of computer monitors, thus they are becoming a very important group of users. They are very critical consumers of the content available on the Internet, so the design of the web pages directed to them is extremely difficult. To learn the child's preferences and expectations regarding the website, it is necessary to perform usability tests of the finished product as well as its prototype. Because the child is not a typical user and requires a special approach during the test, the authors of this paper decided to develop a set of guidelines, which application allows carrying out effective research that will contribute to the identification of more usability problems.

References

1. Usability testing with children, available online: <http://www.webcredible.co.uk/user-friendly-resources/web-usability/testing-children.shtml>.
2. Usability testing with children: a lesson from Piaget, available online: <http://blog.usabilla.com/usability-testing-with-children-a-lesson-from-piaget/>
3. Nielsen J.: Children's Websites: Usability Issues in Designing for Kids, Jakob Nielsen's Alertbox, Sept. 13, 2010r., available online: <http://www.useit.com/alertbox/children.html>
4. Naidu S.: Evaluating the Usability of Educational Websites for Children, available online: <http://www.surl.org/usabilitynews/72/pdf/Usability%20News%2072%20-%20Naidu.pdf>
5. Usability: A Key Issue for kids' sites, Logistic Kids Market Research Journal, available online: <http://www.usability.com.au/resources/kids.cfm>
6. 10 tips for usability studies with children, available online: <http://www.userexperience.co.nz/2010/10/10-tips-for-usability-studies-with-kids/>
7. Demner D.: Children on the Internet, available online: <http://otal.umd.edu/UUPractice/children/>
8. Arseneault C.: Having fun or finding information? Usability for kids sections of web sites, available online: <http://www.museumsandtheweb.com/mw2003/papers/arseneault/arseneault.html>
9. Hanna L., Risdén K., Alexander K.: Guidelines for usability testing with children - methods and tools, Interactions Volume 4, Issue 5, Spet./Oct/ 1997
10. McCoy T.: Interviewing Kids, available online: http://www.cooper.com/journal/2009/12/interviewing_kids.html
11. Carraro J.,M.: Five things you should consider when testing with children, available online: <http://blog.usabilla.com/five-things-you-should-consider-when-testing-with-children/>
12. Barendregt W., Bekker M.M.: available online: http://w3.id.tue.nl/fileadmin/id/objects/doc/Guidelines_for_user_testing_with_children.pdf
13. Naranjo-Bock C.: Approaches to user research when designing for children, available online: <http://www.uxmatters.com/mt/archives/2011/03/approaches-to-user-research-when-designing-for-children.php>

14. Top tips for usability testing with kids, available online:
<http://www.onetooneglobal.com/blog/2011/01/12/top-tips-for-usability-testing-with-kids/>
15. Larkin S.: Usability, Jr. – How to run a successful usability test with children, available online: http://www.stcsig.org/usability/newsletter/0201_usabilityjr.html
16. Bernhardt G.: Designing usable sites for children and teens, available online: <https://www.msu.edu/~graceb/atw/ezine/>
17. Usability of websites for teenagers, available online:
<http://www.useit.com/alertbox/teenagers.html>
18. Search kids, available online: <http://www.cs.umd.edu/hcil/kiddesign/searchkids.shtml>
19. Rannou Y.: Testing educational software with children, available online:
http://www.stcsig.org/usability/newsletter/0201_testingeducational.html
20. Vanulet P.: Child as a customer, SMG/KRC, Researchers Congress 2003
21. Esomar world research codes & guidelines interviewing children and young people, available online:
http://www1.esomar.org.pl/uploads/pdf/ESOMAR_Codes&Guidelines_InterviewingChildren.pdf
22. Hourcade J.P.: Interaction Design and Children, Foundations and Trends in Human-Computer Interaction, Volume 1, Issue 4, April 2008
23. Kirwil L.: Polish children in the Internet. Threats and security in comparison of EU data. Preliminary report from EU Kids Online research carried out in the group of children in the age of 9-16 and their parents, Warsaw School of Social Sciences and Humanities/SWPS, October 21-28, 2010. available on-line:
http://www.swps.pl/images/stories/dokumenty/raport_eukidsonline_polska.pdf
24. Activity of children in the Internet, KidProtect.pl Foundation, report from August 2011r. (in Polish)

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