Children Browsing the WWW

by

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The appearance of the World Wide Web (WWW), called the “Web” for short, has revolutionized the Internet. At home, at the workplace or at school, computers are now more powerful than ever because they can virtually connect to any source of stored information through modems or networks. The Web is the fastest-growing service on the Internet [Lewis95]. This Internet service allows users from all around the world to share and obtain information such as photographs, graphics, audio and text. This information is available to the general public just by accessing the Internet from a personal computer via telephone or connected directly and using a particular application called a “Web Browser”.

Nowadays, acceptance of the WWW is growing among the professionals and university students because of the vast growing number of resources available in the Web. Every company and business is participating by publishing information about their services and/or furnishing on-line services. Thus, users can access the information of interest in spite of their varying degrees of expertise in navigating the Web. Also, university professors and students foster to the growing acceptance of the Web by encouraging its use as a valid research tool. The Web is also a valuable educational tool for the schools, since children would be able to use it to learn more about many things, e.g., sciences, via animated images, audio, etc.

Acceptance of the Web should also grow in the K-12 (ages 5-18) community as a valid educational tool. Thus, there is concern about how this community, especially children, can take advantage of the vast growing number of resources available on the Web [Perrone96]. Since we are faced with an exponentially expanding amount of information, questions about how to bring children on-line and how to introduce them to the Web become an important issue.
It is very important to keep in mind that children have another vision of the world, very different from adults. In addition, there are many factors that will affect their interaction with the Web through a browsing tool. Some of these factors are span of attention, sense of navigation, and navigational skills among others.

The Web currently offers many sites where children learn about interesting things and can have fun with interactive applications. But as we sometimes do, children might as well encounter obstacles using different browsing tools and navigating through these sites. Since usability engineering play an important role in improving the learnability, efficiency, memorability, error prevention, and satisfaction of users [Nielsen93], it should help the children interaction with available browsing tools. This will provide us with a series of guidelines to cope with the difficulties they found so that the access to the Web will be easier to them. Also, it would be interesting to consider alternative methods of interaction, such as speech, joystick, and pen input, which could make the Web access easier to them.

Besides the concern for the access of children to the Web, a speech-based browser could be ideal for solving some of the navigational obstacles in the WWW. The use of speech, the communication scheme used daily by humans, will allow children to become familiar to the system and to interact with it in a more easy natural way. Since speech is the most natural human mode of communication, it is prefer over input from other devices [Rudnicky93]. Thus, it should not be surprising that children may prefer speech input. However, a comparison study has never been made about children performance using a speech web browser over pointer-based browsing tools.

The cross-platform distribution feature of multimedia information in current Internet browsers is often an impediment to comprehensive, interactive, participatory applications for education [Perrone96]. Since children have little or no knowledge in the field, they simply cannot understand the formalities of actual browsing tools. Thus, the
design of any system should not only encompass all the requirements needed to create a
good program, it is equally important to provide the most effective user interface for the
application. Several techniques for developing user interfaces have been studied and used
successfully in applications. User satisfaction is very important since it requires that the
products users use be engaging, informative, and effective from the beginning. Users
respond well to products that provide clear value while encouraging them to explore
further. Therefore, usability engineering goals help establish how different designs
perform against user expectations [Sellers94].
PREVIOUS WORK

Computing has finally become a medium in which to manufacture interesting children’s toys. A good toy has the following properties: (1) it supports extended engagement, so that kids can and do spend hours playing with it; (2) it encourages a diverse set of uses that reflect children’s imagination; and (3) it stimulate conversation, so that kids interact with other kids and adults around it [Soloway96].

Right now, the WWW is the largest information system in the Internet. It was created in 1989 at the European Center for Particle Physics in Geneva, better known as CERN [Lewis95]. The first window-based browser was developed by the National Center for Supercomputing Applications (NCSA) and is known as NCSA Mosaic. Other Web browsers have been created. One of the most important and powerful browsers today is Netscape Navigator from Netscape Corporation which gives access to the Web and to a wide range of Internet services such as FTP, e-mail, and Gopher among others [Lewis95].

In addition, within this vast information system, the WWW offers a broad collection of children’s sites. Some of these sites provides children the opportunity to explore and learn at the same time they have fun, e.g. National Geographic Society-WORLD Magazine [NGS97], Welcome to the Planets [Planets96], and Home Page of Volcano World [Volcano97] among others. On the other hand, there are other sites that are more attractive to children, such as, Disney.com [Disney97], TOY STORY: The Play Room [ToyStory97], Welcome to Toys ‘R’ Us [Toys’R’Us97], and KidsCom [KidsCom97] among others. Since there are so many sites of interest to children, they must learn net searching strategies and skills to be able to navigate and explore this kids space.

Internet scavenger hunts have been successful in teaching net searching strategies and skills. An example of such a system is WebQuest which combines the WWW with a
notion of an interactive quest game [Perrone96]. WebQuest is an educational game for K-12 classrooms, designed to help students gain Internet research skills while searching for answers to questions relevant to current classroom curricula. WebQuest allows the entire WWW to be used as a resource within the game and includes multimodal authorship.

Other computer environments for children have been developed for different purposes. Some of these are:

- **CD-ROM Living Books:** These “books” display a colorful, smoothly animated interface that reads a story aloud to children and their parents. Further, the interface (an on-screen storybook page) uses obvious but unobstructive modes (pages), direct manipulation of on-screen objects, and widely varying sounds to cleverly encourage the reader to explore the story and its background engaging them emotionally, perceptually, and cognitively [Sellers94].

- **KIDSIM:** This is an environment that allows children to create their own simulations. They create their own characters, and rules that specify how the characters are to behave and interact. KidSim is programmed by demonstration, so that users do not need to learn a conventional programming language or scripting language [Cypher95].

- **Woods Visit:** This is a CD-ROM based, interactive multimedia forest environment to be used by first grade children. Woods Visit uses point-of-view (POV) navigation to provide children with a virtual ‘nature walk,’ during which they search for animals and plants along forest trails [Strommen94].

- **Amazing Animation:** This is used by kids ages 5-14 to create movies, video games and interactive school projects. Kids stamp animated characters and sounds onto pre-drawn backgrounds to make stories about space, dinosaurs, underwater life, and many other topics. New characters and background can be
drawn using the drawing tools or clip art can be imported and animated [Halgren95].
OBJECTIVES

The main objective of this study is to find out what is the perception or mental model children develop about the Web and the browsing tool, and the effects this model have in the children’s interaction with the Web. Through an usability engineering study, we could understand how to design browsing tools that take into account the needs, capabilities and preferences of children and identify the difficulties they encountered by age groups. Also, it would be engaging to study how the use of alternative methods such as speech, joystick, pen input, etc. in the children interaction with the Web would affect the design of browsing tools.

The study of the proposed problem will analyze the aspects involved in the interaction. Some of these deals with the children cognitive psychology such as their perception, attention, memory, learning, thinking, and problem solving. Some of these aspects can provide us possible ways to improve their communication and at the same time increase the efficiency of children’s navigational skills.
PROCEDURE

This study deals with one of several methods that were used to investigate the existence, nature, and factors influencing a child's conception of the Web and web browsers. The focus of the study is to examine the child's mental model of the Web in terms of its details and causal effect. The factors of age and experience are highlighted as each child develop his/her own model. Also, this study will explore children's preferences for different Web browsers.

The research will consist of interactivity experiments with the Web through browsers. This might involve some training of how to use a pointing device such as a mouse, what is a Web browser use for, etc. The most important issues that the interactivity on which the study will focus are the mental model develop by a child and their navigational senses — if the child is able to go back to the beginning, etc.

In order to study the interaction of children with the Web through a browsing tool, some usability tests have to be performed. Through this usability engineering study, we will examine the child’s performance with a Web browser considering how they solve each problem presented. A search for children sites available in the Internet will be performed as part of this. A series of tasks will be given to each child which will be related to a particular site. Afterwards, each child will be interviewed to find out what mental model they developed and the difficulties they encountered. The children will be selected from local schools with the consent from parents.

The research will be conducted at the Human-Computer Interaction (HCI) Laboratory of the Department of Electrical and Computer Engineering at the Mayagüez Campus of the University of Puerto Rico.
BIBLIOGRAPHY


A health website for children. AboutKidsHealth is a health education website for children, youth and their caregivers. Thank you to our sponsors. AboutKidsHealth is proud to partner with the following sponsors as they support our mission to improve the health and wellbeing of children in Canada and around the world by making accessible health care information available via the internet. Our Sponsors.

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