

Chapter 61

How Interface Design and Search Strategy Influence Children's Search Performance and Evaluation

Hanna Jochmann-Mannak

University of Twente, The Netherlands

Theo Huibers

University of Twente, The Netherlands

Leo Lentz

Utrecht University, The Netherlands

Ted Sanders

Utrecht University, The Netherlands

ABSTRACT

This chapter presents an experiment with 158 children, aged 10 to 12, in which search performance and attitudes towards an informational Website are investigated. The same Website was designed in 3 different types of interface design varying in playfulness of navigation structure and in playfulness of visual design. The type of interface design did not have an effect on children's search performance, but it did influence children's feelings of emotional valence and their evaluation of "goodness." Children felt most positive about the Website with a classical navigation structure and playful aesthetics. They found the playful image map Website least good. More importantly, children's search performance was much more effective and efficient when using the search engine than when browsing the menu. Furthermore, this chapter explores the challenge of measuring affective responses towards digital interfaces with children by presenting an elaborate evaluation of different methods.

INTRODUCTION

There is a trend in digital media for children to design digital products that are 'cool' and 'playful'. Part of taking a 'playful' approach in designing digital products for children is creating age-appropriate graphics, or graphics that children

can relate to (Meloncon, Haynes, Varelmann & Groh, 2010). In a corpus study of 100 informational Websites for children, we recognized this playful design approach in many of the analyzed interfaces (Jochmann-Mannak, Lentz, Huibers & Sanders, 2012). More specifically, we identified three types of interface design for children, ranging

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from 1) classical interface design with a classical interaction style and without playful graphics, 2) interface design with playful graphics, but a classical interaction style and 3) playful interface design with playful graphics and a playful interaction style. In this study, we analyzed what the effects are of these different design approaches of an informational Website on children's interaction with these interfaces and on children's affective responses towards these interfaces.

The second important objective in this experiment, is to explore the effects of children's use of a search engine on children's search performance and affective responses. Conducting an experiment by letting children interact with digital interfaces is a big challenge. However, measuring children's affective responses towards these interfaces is an even greater challenge, as will be described in this chapter.

THEORETICAL BACKGROUND

Children's Informational Interface Design

Interactive products for children can be classified in entertainment, educational and enabling products (Markopoulos, Read, MacFarlane & Hoysniemi, 2008). Websites for children as a specific group of interactive products can also be classified in these three genres. Most Websites for children are aimed at entertaining children, for example by providing computer games. For our study with children's informational Websites, both educational and enabling Websites are relevant, because most informational Websites are educational and search engines that help children in finding relevant information, can be classified as enabling.

Researchers propose some guidelines for children's Web design (Nielsen & Gilutz, 2002; Meloncon, et al., 2010). Most of these guidelines

were tested and validated with children, but many of the guidelines are not specifically aimed at children, and similar to standard Web design practices for adult Websites. In a large corpus study with children's informational Websites we identified current design conventions for children (Jochmann-Mannak et al., 2012). This study also showed that designers of children's Websites often follow general Web design guidelines. A closer look at the data in this study did reveal three categories of informational Websites especially designed for children. The first category is a Classic design type in which the layout of the pages is kept minimal and the design is aimed at simplicity, consistency and focus. We called the second category 'the Classical Play design type' in which a classic design approach for the navigation structure is combined with a playful, visual design approach. More effort is spent on the design of graphics, colors and games (Meloncon et al., 2010). The third category was called the 'Image Map design type' in which no classic Web design characteristics are used. The visual design and navigation structure on the Websites of this type are based on Image maps that incorporate objects or locations that children know from real life or from fiction. Children can explore this tableau of real life or fictional objects, which makes information-seeking a playful experience (Meloncon et al., 2010). This Image map web design can be compared to 'spatial metaphors', which can be employed to visually represent information, using the universe, the solar system, galaxies, and so on through which the user navigates to locate information (Chen, 2006).

In their study to develop a visual taxonomy for children, Large, Beheshti, Tabatabaei, and Nasset (2009) emphasized the importance of movement and color in any visualization designed for children. They argue that "such characteristics do not necessarily influence positively the effectiveness of a taxonomy, but the affective reaction of users, and especially of children, that should never be

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