

A USABLE WEB FOR LONG-STAY HOSPITALISED CHILDREN



The use of telecommunication and computer technology to support the education of hospitalised children is promising, but it requires the support of appropriately designed interfaces.

Our research aims to contribute to these issues by analysing the ways in which hospitalised children use the Internet and by identifying usability guidelines related to web interfaces for a learning environment.

The research

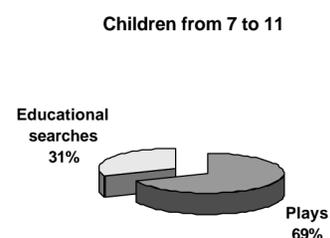
The research was conducted with 229 long-stay children in several hospitals in Milan using a structured questionnaire.

Children aged between 7 and 11 (118) mainly used the computer for:

- playing, with the help of their parents or of the hospital staff (69% of the subjects);
- simple educational searches (31% of the subjects).

On average these children spent 37 minutes per day on the computer:

- 6 minutes, in order to find school material;
- 31 minutes, for other purposes.

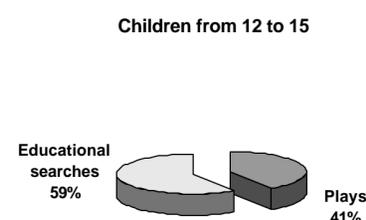


Children aged between 12 and 15 (111) mainly used the computer for:

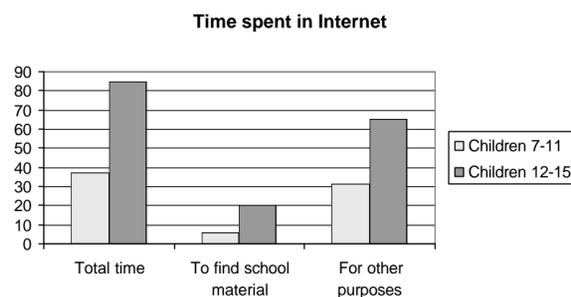
- complex games without the support of the parents or the hospital staff (41% of the subjects); amongst this sample, 67% interacted with people met on the Internet (for example, to play backgammon);
- simple educational searches (59% of the subjects).

On average these children spent 85 minutes per day on the computer:

- 20 minutes, in order to find school material;
- 65 minutes, for other purposes.



Results



- The use of computers in the hospital allows children to maintain the perception of a high level of self-efficiency and to have good levels of self-esteem.
- There is a correlation between increasing age and a higher level of personal optimism.
- The more the level of self-esteem increases, the more the level of self-efficiency seems to remain constant.
- Among all the test groups, a strong facility for self-recovery seems to be correlated with a high self-efficiency level.

Usability issues

The potential of computers to help disadvantaged children should be enhanced by the careful design of the resources they can access.

Layout

When designing a web page, developers should consider the text width and design for shorter lines (about eleven words) as opposed to longer ones. Longer lines require greater lateral eye movements and make reading more tiring.

People with poor reading ability perform better when the line length is shorter (seven words). Hence children, especially if they have some disabilities, or if they are tired or under certain medical regimes, prefer reading short lines.

The page should be linear (content organized from left to right and from top to bottom); the navigation of a non-linear page can be difficult for users with input or output devices different from standard keyboard, mouse and monitor.

Fonts

14-point fonts are considered to be easier and quicker to read; in terms of the typeface, children show a preference for Comic and Arial.

The average user perceives sans serif fonts as being easier to read and also, more attractive.

Colours

An appropriate combination of colours with high contrast between background and foreground are fundamental requirements.

It is also necessary to remember that there are many children with colour deficient vision. For these children it is impossible to read information encoded with particular colour combinations, such as red and green or blue and yellow.

Use of animation

Children are attracted by animations: colourful animated pages or images usually attract children's attention.

It is best to avoid animations offering no interactivity, i.e. with no opportunity for input from the user; this applies both to continually repeating animations (since they annoy the viewer) and to animations that only cycle once, since these types of animation can be confusing.

Animations inviting user input are useful, especially in the case of hospitalised children, because they are often tired or under medication, thus resulting in a reduced threshold of attention.

Support multiple methods for access

A hospitalised child makes use of a personal computer and the Internet in different contexts and under different conditions, and should always be able to use a system without effort.

It is best to avoid the use of links without interstitial text (links not separated by text or blank spaces) and the insertion of elements that require mixed mouse and keyboard sequences, such as multiple select input elements in forms. Because pointing can be less precise, users may need larger targets or increased spacing between targets.

Within the HTML code, it is suggested that a label is present for every form element - this allows users to "press" a button by clicking on the button itself or above and around the related text. For a similar purpose, it is important to provide the user with index information for links, to order correctly, page links accessed with the tabulation key.

Another technique is to provide redundant communication channels, perhaps by supplying both auditory and visual feedback.

As an example, to communicate an error message, it is not useful to rely on colour only; it would be more usable to provide sound, visual and textual messages. As a further example, when using images as well as movies or audio objects, it is good practice to furnish every image or object with an alternative textual description.

Providing equivalent information to visual, auditory and textual content is, incidentally, probably the best way to make the page accessible to *everyone*.

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