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E-accessibility for visually impaired students (KEYNOTE TALK)

In this talk, I will explain on how persons with a reading disability can access library material, focussing mainly on eLibraries or similar initiatives. But first of all some information is needed on the ways this group of persons is behaving for getting access to electronic materials.

Reading disabled persons

This term encompasses the group of people consisting of persons with a visual disability (low vision or blindness) but also persons with dyslexia (who often have problems with the interpretation of printed text) or those that cannot handle a printed book because of severe motor limitations. All of these persons have in common that they have to rely on electronic documents in one form or another.

Specific techniques for persons with a visual limitation

Low vision is a very general term, covering very diverse types of visual impairments ranging from colour blindness, over blurred viewing to very partial sight (tunnel vision e.g.). In order to read texts, mainly magnification is used. Sometimes audio support increases reading speed.

Although Braille reading is an important input method for blind persons, only 10% of them is fluent in Braille. The others rely on audio transcription of the written material by a human reader or by computer speech synthesis. Talking books, distributed on minicassette have been for many decades the preferred method for distributing information to blind persons. However since about 10 years these cassettes are gradually replaced by cd's. Due to the fact that audio cd's (well known from the Music industry) have a limited playing time of 80 min. maximum, it is standard practice not to use audio but data cd's that primarily contain a collection of mp3 files. With data cd's a trade off between file size and sound quality is possible.

A classic Daisy reader using cdrom's

A portable Daisy reader using SD-cards

In order to guarantee an international exchange of audiobooks, the file structure of the book has been standardised under the title "Daisy book". This standard describes in detail the structure of a book and the links between the structure and the individual audio and text files. Audiobooks containing the text as well as the audio in an interlinked format are called hybrid books. The Daisy standard has also permitted to produce small hardware Daisy cd readers (similar to a "disk man"). These portable devices can be used for book reading when on the move.

Other impairments

People with dyslexia generally prefer to combine a visual overview of a text or a page with the possibility to have parts of a page or an article read aloud. Quite often PDF files with added audio links are used. In Belgium two types of reading software are popular: Kurzweil and Sprint.

In general no special file types are used for persons with a motor disability. Here the computer itself must have input-output methods accessible and usable by the reader.

Commercial vs. specialised audiobooks

It is important to know that more and more printed books are getting published in an audio version produced by commercial groups too. In the commercial approach this often means that a book is available as a pile of audio cd's (due to the limited recording time on one cd) or in specialised formats such as ".aa" (audible.com) or " .mp4" (iPod).

Daisy books are produced in specialised (and often subsidised) production centres. As limited quality audio is used, huge compression rates for the mp3 files can be used, resulting often in more than 20 hours of speech on one cd.

What formats an eLibrary could provide?

Following electronic formats could help most of the library users with a reading impairment.

* text only documents are usable by most readers but are rather uncommon. A slightly better option is to provide Microsoft Word or Open Office formats (".doc", ".rtf" or ".odt"). These formats can be turned relatively easy into talking books too (Daisy format)

* PDF based documents, but they should be "tagged". Details from Adobe and the Leuven AMF project will be discussed

* audiobooks on either audio format or data format(1). Data formats include books with a set of sequentially numbered mp3 files or the Daisy format which has additional navigation information packed with the mp3 files.

Attention must also be paid to the cataloguing of these electronic documents. Items that should be catalogued and used in catalogue searchers include, e.g., exact description of the format.

Is a book complete or excerpted? Quite often commercial audiobooks provide only part of the content of a book.

Is the voice used in an audiobook a human or a computer one? If read by a human person, his/her name details must be searchable too.

What is the recording quality? Which voice is used (e.g. local variants such as Austrian German or Canadian French or Dutch with Flemish intonation…. etc.

What formats are not usable for reading impaired persons

Many of the books that are nowadays made available electronically are presented in formats that cannot be used by the group of reading impaired persons.

A preliminary and limited scope test together with the Leuven library (2008) provided following conclusions

a) some online books are just a collection of scanned pages; often they can be downloaded only one by one and even more frequently even downloading is not possible, leaving only screendumping as an option. None of the Daisy features is or can be made available , unless OCR is applied.

b) others are based on PDF pages but again it is almost never possible to download the whole book and therefore no audio (e.g. for people with dyslexia or other reading impairments) can be added to the electronic document.

c) a popular option is also the use of Flash materials. But the Flash viewer software is generally not accessible for persons with a reading disability as itdoes not work together with their screenreaders(2).

Conclusions

Setting up an electronic library should take into account the need of reading impaired persons right from the beginning. In this discussion we brought together some of the elements that will contribute to the creation of an accessible e-Library.

References:

1. respectively called the Red and Yellow cd standards. Cf. http://en.wikipedia.org/wiki/Red_Book_(audio_CD_standard) & http://en.wikipedia.org/wiki/Yellow_Book_(CD-ROM_standards)
2. Leporini et al., "Is Flash Really Accessible When Interacting through Screen Readers?", planned contribution to the AAATE conference 2009 (Florence)

Prof. Jan Engelen (°1945) has a PhD in Applied Sciences (Electronics Engineering) and is currently professor at the Katholieke Universiteit Leuven in Belgium. He is in charge of teaching Electronic Engineering project work to bachelor students and Fiber Optics Communication to telecommunications engineers. Since several years Jan Engelen is involved in electronic newspaper production, both in XML/Daisy and in audio format (talking newspapers, hybrid books). He is developing new distribution channels for these newspapers and is researching the audio-books boom, both from a technological and an economical perspective.