Improving OER Websites for Learners with Disabilities

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ABSTRACT

Despite the inclusive vision of the OER initiative, the challenges faced by people with disabilities for accessing and using these educational resources are still being addressed.

In this work, we present an OER website designed for enhancing the User Experience (UX) of learners with disabilities in the interaction within this website for searching and retrieval of resources according to their needs and preferences. This design is based on a framework previously developed that included the concepts of accessibility, information architecture, and usability as the main aspects for the UX. The personalization defined by a user for a better UX is stored for successive accesses, but it can be changed any moment.

CCS Concepts

• **Human-centered computing**➜ Human-computer interaction (HCI) ➜ Empirical studies in HCI • **Applied computing**➜ Education➜ E-learning • **Social and professional topics**➜ User characteristics➜ People with disabilities

Keywords

Open Educational Resources; User Experience; Accessibility; Usability; Information Architecture.

1. INTRODUCTION

Open Educational Resources (OER) are usually stored in repositories available through websites. People with disabilities face some barriers arising from both the lack of accessibility of these websites and the resources themselves.

The User Experience (UX) implies all aspects of the users' interactions within websites, considering their expectations about the attainment of their goals [1]. In spite that the UX also involves subjective aspects such as hedonic and emotional [2], for this work we have just addressed the aspects of the UX that could be defined in the website design [1, 3, 4].

We have developed an OER website based on a framework to enhance the UX of users with disabilities by considering not only accessibility principles but also usability and information architecture practices. In this type of website, an important issue is the findability of the resources and their matching with particular learning requirements of the users, from their educational and disability profile.

2. THE OER WEBSITE

The goal of this OER website is to offer a positive UX to all learners, including those with disabilities. To get that, the design of the website relies on the selection of a user profile that includes disabilities considerations. Further, the user can customize the preferences for interface visualization and behavior. This complete profile affects not only the interface layout but also the selection of resources suitable for the user.

2.1 Accessibility

To personalize the website, we have proposed some initial user profiles that include choices for language and disabilities as seen in Figure 1.
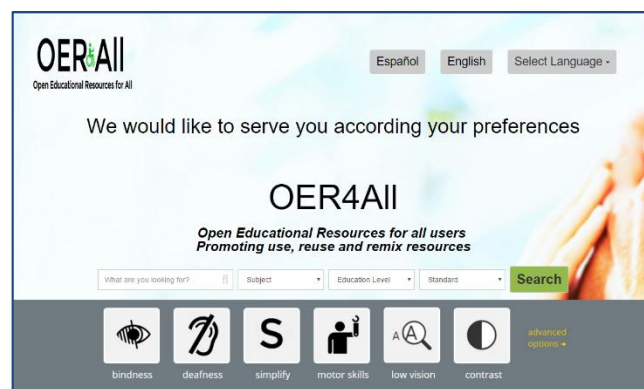

Figure 1. User profile selection

Language bar. The language of the website, as well as the language of the resources, are barriers to using OER. This website offers a setting bar that enables the selection of the language (top of Figure 1).

Disability profile bar. The website offers the customization of the interface based on distinct types of disabilities:

Blindness. This profile restricts the selection of educational resources suitable to be used employing screen reader software. For example, videos with audio descriptions or accessible PDF documents (PDF/UA) are selected. This selection has no effect on the visualization of the interface.

Deafness. This profile presents the content in plain text and restricts the selection of resources. For example, only podcasts with transcripts, videos with subtitles or with a sign language version are offered to the user.

Simplify. The wide variance on disabilities related to learning and cognition makes difficult to adjust this profile. For this selection, the interface shows the table of content for easy navigation and displays only the main content, increases the text size and line spacing.

Motor skills. This profile facilitates the navigation of people with motor skills issues for using the mouse or the keyboard to input text. The effects are the enlarging of buttons, menus, text fields, and

other inputs fields, flashing effect on current focus, and the display of links for skipping to the content.

Low vision. This profile enlarges the text of the interface in 200%. Also, it underlines and highlights links.

Contrast. This profile offers the customization for differently sighted users, for instance, people who as a consequence of aging have reduced sensitivity to contrast.

As a way of example, in Figure 2 we can see the difference between a default presentation of a resource and a presentation with different language selection and a low vision profile.
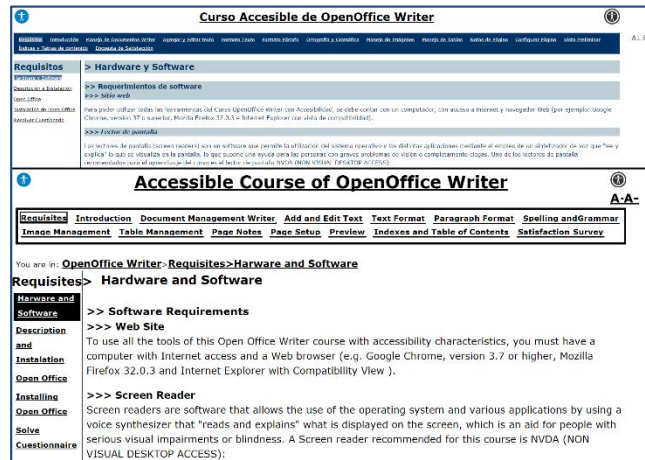

Figure 2. Resource visualization with language and low vision profile

Tuning preferences

In addition to the selection of initial disability profiles, this website offers the tuning of users' preferences for these aspects:

Text size. To increase the text size on a continuous scale.

Font size. To select sans-serif or serif fonts, considering that serif fonts are advisable for the web.

Line spacing. To increase up to 3 times on a continuous scale.

Navigation aids. To activate breadcrumbs and highlight the links.

2.2 Information Architecture

The current conception of IA related to web environments involves information organization that considers multiple users' realities and the context of their use [4]. For OER websites, one essential consideration for description and organization of the resources is the metadata standard.

In this website, we have considered the IMS AccessForAll (AfA) Metadata [5] that enables an inclusive learning experience through the description of OER to fit individual needs of learners. The standards AfA Digital Resource Description (DRD) is used to describe the resources, and the specification Afa Personal Needs and Preferences (PNP) provides a way to declare of accessibility preferences based on the user profile. These specifications provide a common language for descriptors that identify and describe the resources. By doing so, it is possible matching the needs and preferences of learners with the resources. For instance, a video that includes an interpretation of this content with sign language that could help to deaf people.

2.3 Usability

Usability implies how easily users can use the website and by doing so, achieve their goals with effectiveness, efficiency, and satisfaction [6]. Web usability enhances the UX of all users and particularly of users with disabilities. One important usability issue is the searching process because it may become a time-consuming activity and it can discourage the use of OER. In this website, the design of the home page prioritizes the primary goal of the user in the website which is the searching and retrieval of resources. For instance, in the middle of the page, we have highlighted the most common fields for searching.

2.4 Architecture of the system

The searching of the resources is based on a personalization process that considers the user disability profile to set the accessibility preferences on the AfA PNP standard, in addition to the specific requirements for the resources (topic, subject matter, and educational level). The AfA DRD standard enables the retrieval of the resources that match the searching conditions. Figure 3 represents a simplified scheme for the searching and retrieval of resources.
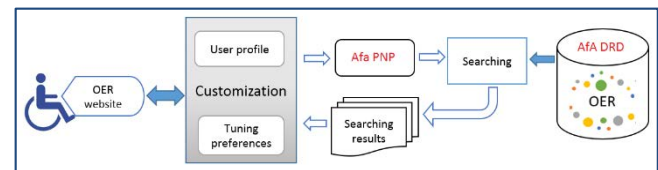

Figure 3. Searching scheme based on user disability profile

This personalization process aims to facilitate the interaction and simplify the searching and retrieval of resources for improving the UX of learners, in particular, of learners with disabilities.

3. ACKNOWLEDGMENT

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