# Web Accessibility: Does It Have a Role in Delivering Distance Education?

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## Abstract

Web accessibility is a hot topic in international forums of professionals who are dealing with WWW to communicate with their clientele as it is very vital in facilitating various ways that users access information. Distance educationists are vastly using the Web channel in delivering their courses and support services. Therefore, Web accessibility is very important for distance educationists, particularly after they have promised to provide equal educational opportunities for ALL. However, when considering the findings of the study conducted to identify the current status of accessibility of Open University Websites of Commonwealth countries it is obvious that there is a long delay in applying the accessibility techniques in designing the Websites in the distance education sector.

## INTRODUCTION

Educational historians believe that the concept and application of distance education (DE) has been in existence for over 200 years (Ladner, 2003). Invention of paper and printing machine and development of the postal system have provided fundamental requirements needed for teaching and learning in an environment where teacher and learner are separated. Later, with the development of telecommunication industry, learning at a distance becomes a promising counterpart of education system due to its flexible nature and the ability of reaching the unreachable.

In spite of the magnificent growth rate of DE, distance educationists are still struggling with student drop-outs and lower completion rate. According to Marsh (2003), Carr (2000) has reported that students following DE courses have a 10-20% lower course completion rate than students in traditional courses, with drop-out rates sometimes over 50%. Many professionals such as Klukas (2006), Carr (2000), Marsh (2003) point out that inability of institution to provide necessary student support services using proper channels is one of the main reasons for the high incompletion rate.

Website has become the trade mark of the modern Web-based DE systems since the distance educationists has begun to use the Web to deliver online real-time study programs and student support services. By now Web is affluent with huge number of Websites published by the DE institutions worldwide. However, the quality of these sites has to be closely monitored if distance educationists wish to design a system that can be enjoyed by ALL target groups equally. Tim Berners-Lee, Director of the WWW Consortium (W3C), has made a very important statement - "the power of the Web is in its universality. Access by every one regardless of disability is an essential aspect" – which highlights the value of accessible Web design in achieving development goals.

The aims of this article are to enlighten the authorities of DE, about the importance of Web accessibility in achieving their fundamental goal of providing equal educational opportunities for ALL; to present the current level of Web-accessibility of Open University and library homepages of Commonwealth countries; and finally to discuss several inexpensive and easy approaches for designing and maintaining a barrier-free Website.

## WEB ACCESSIBILITY: WHY WE NEED IT?

Kirkpatrick (2003) defines accessible Web design as "designing the Websites in a manner such that the information they contain is accessible regardless of a person's abilities or disabilities, software, or equipment". There are thousands and thousands of users around the world who can be benefited by accessible Web design. As many researchers such as Kirkpatrick (2003), Polanka & O'Gorman (2001) and Jasek (2007) show, each accessible design choice generally benefits several disability groups at once and the Web community as

a whole. For examples, using simple language is important for people with learning and cognitive disabilities as well as for those who don't speak the language of the site perfectly (Golub 2001). The phenomenon is more obvious when going through the different types of user groups that would be benefited by accessible Web design.

- People with various disabilities (disability is reduce ability to perform tasks one would normally do at a given stage in life. They may not be able to see, identify the difference between certain colours (colour-blindness), hear, move or may not be able to process some type of information easily or at all. They may not be able to use keyboard or mouse.
- People using text-only screen, a small screen, or a slow internet connection.
- People do not speak or understand fluently the language in which the document is written.
- People in situations where their eyes, ears, or hands are busy or interfered with (driving, working in a loud environment).
- People using early version of a browser, a different browser, a voice browser or a different operating system. (Polanka & O'Gorman 2001)

It is very much obvious that how vital the accessible Web design is, as we all have users who belong to either of these groups permanently or temporary. Person who is in a dark room is equal to a visually impaired person and person who gets his/her hand sprained is equal to a person with limited mobility of arms. Hence, distance educationists should keep the accessibility in mind in designing their Websites if they are working towards their target of creating a flexible e-learning environment, where their clients are free to learn whatever they can, whenever they can and wherever they are.

The advantages of accessibility techniques are not limited to enhancing the ways in which users access information. It also helps the indexing process of search engines thus Website could be more easily found by users ("spiders" that harvest words and terms from Websites can read <alt> tags though they cannot read information contained in images). In addition, it supports new technologies such as Personal Digital Assistants, TV-based Web browsing systems, WAP browsers in mobile phones etc (Golub 2001).

## WEB ACCESSIBILITY: WHERE ARE THE COMMONWEALTH COUNTRIES AT PRESENT?

Researcher has designed a study to measure the accessibility of Websites of Open universities established in current members of Commonwealth Nations. First of all researcher had to develop a list of Open Universities due to the unavailability of a reliable source to get the information directly. Thirty-one (31) Open Universities (See annex I "List of Open Universities – Commonwealth Countries") established in 16 countries (out of 52 member countries) were identified via personal contacts and "Google" and "AltaVista" searches conducted during the first two weeks of October 2007. Process was repeated a week later for the Universities that researcher failed to locate a Website in the first attempt.

The two different search engines were used to reduce the effect of routine weaknesses of search engines and to enhance the possibility of tracking the Web address if the relevant University is hosting a Website. The process was repeated a week later to minimize the possibility of temporary technical problems of the host server on non availability of the Website at the time of first searching. See "Table 1" for the number of Websites identified during this study.

Table 1 – Number of identified Websites

| | |
|---|---|
| Number of University Websites | 28 |
| Number of library Websites | 18 |

See annex II – "List of University Websites" and annex III "List of Library Websites".

In the next step researcher had to select an automated evaluation tool to measure the accessibility of the homepages of these Websites. Researcher decided to use the online service – WebXACT - of "Watchfire", distributor of "Bobby", which was a free service at the time of the measuring the accessibility in this study. (Note: this service has been terminated

since 29<sup>th</sup> February 2008)

"Bobby" was selected since many researchers such as Craven (2002), Spindler (2002) and Schmetzke (2001) have used "Bobby" and expressed it as a suitable and effective tool where the accessibility of number of individual Web pages need to be evaluated and a rough measure of accessibility suffices.

**Accessibility Evaluation Results**
'Bobby" divides the accessibility errors into 3 sections to be tested:
- Priority 1 errors indicates problems that must be fixed immediately (sites without priority 1 errors are free from serious accessibility errors and are eligible for the Bobby Approval)
- Priority 2 error indicates problems that should be fixed if possible
- Priority 3 errors indicates problems, which should, if possible, be taken into consideration

Twenty-seven University homepages and fifteen library homepages were measured using the "Bobby". One University homepage and three library homepages have to be excluded from the "Bobby" test.

Results were not very encouraging. Only six University homepages and four library homepages were able to receive the Bobby approval – free from priority 1 error. In other words, 76% (78% University sites and 73% library sites) of Websites tested are having serious accessibility problems.

However, a closer look at the number of instances of accessibility errors on individual pages, which were rejected by Bobby, suggests that the problems may not be as serious as they first appear. A site with five or fewer errors is quite simple to fix (Spindler, 2002).

Nevertheless, even the sites that got the "Bobby" approval are not entirely free from accessibility problems. They contain priority 2 and priority 3 errors. See "Table 2" and "Table 3" for details of most frequent accessibility errors identified during this study.

Table 2 - University homepages

|  | No. of sites consisting the error | No. sites consisting the error over 5 instances |
|---|---|---|
| Elements missing Alt text | 15 | 9 |
| Elements missing height and width attributes | 12 | 1 |
| Broken links/ broken anchors | 15 | 2 |

Table 3 – Library homepages

|  | No. of sites consisting the error | No. sites consisting the error over 5 instances |
|---|---|---|
| Elements missing Alt text | 10 | 4 |
| Elements missing height and width attributes | 8 | 1 |
| Broken links/ broken anchors | 10 | 2 |

**WEB ACCESSIBILITY: HOW TO ACHIEVE?**
Accessible Web design is neither very expensive nor complicated. Many researchers, such as Craven (2002), Kelly (2002), Zaphiris & Zacharia (2001), who had conducted usability testing, have come to a more or less similar conclusions, confirming that most of the frequent accessible errors appearing in the tested Websites are quite easy to fix.

Christensen's (2001) experience of teaching accessible techniques to Webmasters at Danish National Library for the Blind, nicely illustrates how easy to fix certain accessibility errors if the Web designer is aware of the issue. Christensen states that one of her participants was surprised to realize that the navigation bar on her Website was totally inaccessible to the

screen reader because she was using pictures as buttons in the menu. It has taken only 15 minutes for her to make her Website (or at least the homepage) completely accessible by adding the alternative texts to the pictures and the titles to the links.

Hence, it is obvious that design accessible website is not a big challenge if the Web developers are aware of it. Web accessibility has not been yet included into the curriculums of professional development courses as frequently as it should be. However, one can easily learn from "teach yourself" technique. Web accessibility is one of the richest areas in the literature and there are plenty of publications that describe the various types of research techniques such as user surveys, focus groups, paper prototyping, heuristic evaluation, cognitive walkthrough, card sort protocol, think aloud protocol etc; that can be used to measure the usability and accessibility of a Website from the initial stages of Website development.

Besides, institutions that are going to conduct Web design/ redesign project can easily learn from the experience of those who have preceded them by inviting a speaker with experience of handling such a project at a similar institution to offer the Web team an overview of what a full process might look like.

In addition, there are many well established initiatives such as WWW Consortium and its Web Content Accessibility Guidelines, Section 508 Standards and Yale Style Guide etc to provide guidance and  recommendations to overcome the accessibility problems.

Besides, there are many freeware or open-source tools that measure the accessibility accordance with standard guidelines. Following are some of the examples for useful tools and services that measure the accessibility in various aspects:
- **Automated accessibility evaluation tools** "WAVE" (http://wave.webaim.org), Web AIM" (http://www.webaim.org)
- **HTML Validators** - "WDG HTML Validator" (http://htmlhelp.com/tools/validator), "W3C Markup Validation Service" (http://validator.w3.org)
- **Cascading Style Sheets -** "W3C CSS Validation Service" (http://jigsaw.w3.org/css-validator)
- **Colour checkers** - "Contrast Checker" (http://q42.nl/demos/contrastcheck), "Accessibility Colour Wheel" (http://gmazzocato.altervista.org/colorwheel/wheel.php), "Vischeck" (http://www.vischeck.com)

**CONCLUSION**
Websites that are designed without accessibility considerations should not be tolerated (Spindler 2002). A good designer, who is careful about writing the code and proper testing, can create a site that is both eye-popping and accessible (Spindler 2002). But many people don't even know, for instance, that a blind person can use the Internet. So they very rarely put up an effort to apply recommendations of Web accessibility guidelines in designing their Websites. Another drawback is lack of the government attention towards Web accessibility. Only few countries have legislations to ensure that disabled people will have access to technology (like Section 508 in the U.S.) though accessibility of Websites and electronic resources is as important in the modern information age as is accessibility to public buildings and spaces.

Equal access to information enhances, "equal opportunity for education", which is the prime goal of open and distance learning. Hopefully, accessible Web deign might bring a positive influence to popularizing DE among the Commonwealth nations and raise the percentage of countries (just around 31% currently) providing the service.

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**ANNEX I**

**Open Universities - Commonwealth Countries**

**Australia**
Open Universities Australia

**Bangladesh**
Bangladesh Open University

**Canada**
Athabasca University, (Open University Canada)

**Cyprus**
Open University of Cyprus

**India**

Dr. Babasaheb Ambedkar Open University (BAOU)
Dr. B R Ambedkar Open University
Indira Gandhi National Open University
Karnataka State Open University,
Madhya Pradesh Bbhoj Open University
Nalanda Open University (NOU)
Netaji Subhash Open University (NSOU)
Pandit Sunderlal Sharma Open University (PSSOU)
U.P.Rajarshi Tandon Open University
Vardhaman Mahaveer Open University (Kota)
Tamil Nadu Open University (TNOU)
Uttaranchal Open University (UOU),
Yashwantrao Chavan Maharashtra Open University
K. K. Handique State University

**Kenya**
African Virtual University* **(**Ghana, Ethiopia, Uganda, Tanzania, Zimbabwe)
(*Single page- site under construction*)

**Malaysia**
Open University Malaysia
Wawasan Open University
Uniiversity Tun Abdul Razak

**New Zealand**
Open Polytechnic of New Zealand

**Nigeria**
National Open University of Nigeria

**Pakistan**
Allama Iqbal Open University

**South Africa**
University of South Africa

**Sri Lanka**
Open University of Sri Lanka,

**Tanzania**
Open University of Tanzania

**Uganda**
Global Open University Uganda
Mbale, Uganda

**United Kingdom**
Open University UK, Milton Keynes, UK

**Zambia**
Global Open University Zambia
Lusaka, Zambia


**ANNEX II**

**List of University Websites**

African Virtual University*
http://www.avu.org/

Allama Iqbal Open University, Palestine
http://www.aiou.edu.pk/

Athabasca University, (Open University Canada)
http://www.athabascau.ca (Bobby approved)

Bangladesh Open University
http://www.bou.edu.bd/

Dr. Babasaheb Ambedkar Open University (BAOU)
http://www.baou.org/

Dr. B R Ambedkar Open University
http://www.braou.ac.in/

Global Open University Zambia
http://www.universityzambia.net/

Indira Gandhi National Open University
http://www.ignou.ac.in/

Karnataka State Open University,
http://www.ksoumysore.com/

Madhya Pradesh Bbhoj Open University
http://www.bhojvirtualuniversity.com/ (Bobby approved)

Nalanda Open University (NOU)
http://www.nalandaopenuniversity.com/

Netaji Subhash Open University (NSOU)
http://www.wbnsou.com/

National Open University of Nigeria
http://www.nou.edu.ng/noun/index.htm

Open Polytechnic of New Zealand
http://www.topnz.ac.nz

Open Universities Australia
https://www.open.edu.au/wps/portal (Bobby approved)

Open University of Cyprus
http://www.ouc.ac.cy

Open University Malaysia
http://www.oum.edu.my/portal/

Open University of Sri Lanka,
http://www.ou.ac.lk (Bobby approved)

Open University of Tanzania
http://www.openuniversity.ac.tz/ (Bobby approved)

Open University UK
http://www.open.ac.uk/  (Bobby approved)

Tamil Nadu Open University (TNOU)
http://www.indiavarta.com/education/tamilnaduopenuniversity/index.asp

U.P. Rajarshi Tandon Open University
www.uprtou.com

University of South Africa
http://www.unisa.ac.za/

University Tun Abdul Razak
http://www.unitar.edu.my/

Vardhaman Mahaveer Open University (Kota)
www.vmoukota.org

Wawasan Open University
http://www.wou.edu.my/default.aspx

Yashwantrao Chavan Maharashtra Open University
http://www.ycmou.com


Note: site excluded from the Bobby test - * single paged site


**Annex III**

**List of Library Websites**

Allama Iqbal Open University, Parkistan
http://www.aiou.edu.pk/DeptDetail.asp?DeptID=36

Athabasca University, (Open University Canada)
http://library.athabascau.ca/ (Bobby approved)

Bangladesh open university*
http://www.bou.edu.bd/home.html

Dr. B R Ambedkar Open University*
http://www.braou.ac.in/library.htm

Global Open University Uganda
http://www.universityuganda.net/contact.htm

Indira Gandhi National Open University, New Delhi**
http://www.ignou.ac.in/divisions/mpdd/index1.html

Karnataka State Open University, Mysore-570 006 Karnataka
http://www.ksoumysore.com/html/library/index.html

National Open University of Nigeria
http://www.nou.edu.ng/noun/depts/elibrary/library1.htm

Open Polytechnic of New Zealand
http://www.openpolytechnic.ac.nz/programmesandcourses/construction/library/

Open Universities Australia (Note: library services are providing by the division of "Library services for Open University of Australia Students of Murdoch University library)
http://wwwlib.murdoch.edu.au/for/oua/#services

Open University of Cyprus
http://www.ouc.ac.cy/index.php?page=study_elib_info&lang=en

Open University Malaysia
http://iportal.oum.edu.my

Open University of Sri Lanka
http://lib.ou.ac.lk/ (Bobby approved)

Open University of Tanzania
http://www.openuniversity.ac.tz/Library/library.html (Bobby approved)

Open University of UK
http://library.open.ac.uk/ (Bobby approved)

University of South Africa
http://www.lib.uct.ac.za/

University Tun Abdul Razak
http://elib.unitar.edu.my/

Wawasan Open University
http://www.wou.edu.my/library/default.aspx

Note: Sites excluded from the Bobby test
* single paged or under construction sites
** cannot be analyzed by Bobby due to scripts and coding of the site