Web Content Accessibility for Persons with Disabilities:  
A Case Study of Indian Open Universities

The radical development of the Internet and other information and communication technologies has changed the education system's scenario in general and open and distance learning in particular, which was further accelerated by the recent COVID-19 pandemic. Nowadays, information and Communication Technology (ICT) tools are pivotal to any Open and Distance Learning (ODL) system. With the growth of ICT-based education, the accessibility of digital information has also gained the attention of intelligentsia. With the interference of ICT tools, discussions have been taking place about the digital accessibility of web-based information available over websites. Websites of Open Universities are the central source of educational and administrative information and learning for a learner enrolled in an open and distance learning system. Further, the fundamental promise of an open and distance learning system is providing education for marginalized groups. Thus it must be as per the needs of persons with disabilities, recommended by the United Nations Convention on Rights of Persons with Disabilities (UNCRPD). An inquiry has been made in the present research to study immediate accessibility features Screen Reader Access, High Contrast Text, Word Spacing, Text Resize feature, and the feature of language change available over websites of Indian Open Universities. It was observed that about 45% of Indian Open University websites lack any such accessibility features. The remaining 55% of open universities of India were mostly found providing two to four out of these five accessibility mechanisms required for persons with disabilities on any website as Government of India has developed Guidelines for Indian Government Websites (GIGW) which has advised the government institutions to confirm their websites in compliance with Web Content Accessibility Guidelines (WCAG 2.0) guidelines of World Wide Web Consortium (W3C) at ‘AA’ level. The study revealed that Indian Open Universities has a long way to make their websites GIGW & WCAG 2.0 complaint to ensure digital accessibility in higher education through open and distance learning for persons with disabilities to ensure inclusion in higher education in India.

Keywords: Open and Distance Learning, Information and Communication Technologies, Digital Accessibility, WCAG Guidelines, GIGW Guidelines

Introduction

The evolution of the Internet and other related technologies was a revolution that has changed human life to a greater extent. The emergence of the Internet and other Information and Communication Technologies has made human life more manageable and, to a certain extent, made those things possible that were supposed very difficult otherwise, if not impossible, four decades back. The Internet has a significant contribution in making the world a
global village. Internet and Information and Communication technologies have penetrated all human activities, whether it is banking, finance, education, medical, or any human activity. There are several clear economic, educational, social, and health-related advantages for the majority who have access to ICT (particularly computers and the Internet) (Macdonald & Clayton, 2013). It has made the human-to-human or machine-to-machine or machine-to-human interaction faster and significantly more accessible. The ongoing radical changes in Information and Communication Technologies have transformed entire education systems (Arulogun et al., 2020; Cavus, 2015; Guri-Rosenblit, 2005; Renes & Strange, 2011; Stošić, 2015; Weidlich & Bastiaens, 2018).

Even since its emergence, ICT tools have brought up a new generation of learning (Guri-Rosenblit, 2005), which is further reinforced dramatically by the COVID-19 pandemic situation during which ICT tools were widely used for education across the world (Dhawan, 2020; Dwivedi et al., 2020; Thomas & Rogers, 2020). The significant benefit of ICT tools-based learning is the convenience to use, i.e., using ICT tools, one can get one's studies anywhere and everywhere. It makes it easier for learners to replay or replicate the content, store the content, and retrieve the content with more ease. In the modern era of education, the application of modern educational ICTs has a major role to play (Oladokun & Aina, 2011).

The Websites of universities play a major role in communication with stakeholders. Websites are the easiest way to find out any information, communicate and get responses on queries, get information related to examination admission, get in touch with faculties and staff, or real-time interaction, e-learning, personal contact program through Web conferencing. Whether instructional aspects, curriculum transactions, student's support, grievance redressal, examination, or assignment submission, a student has to be ICT-friendly now in the post-COVID-19 pandemic system. As universities have an essential role in higher education, these must be equipped with ICT tools, and the university's information needs to be disseminated through the websites. Making universities' websites a great resource of information is a recent trend in the area now, whereas accessibility of this information for persons with disabilities based on universal design principles is still a big question. The accessibility of web pages is among one of the critical criteria for disseminating information to a broader group of audience (Aizpurua et al., 2016; Ismail & Kuppusamy, 2018) as accessibility and universality are essential aspects of web-based mediums (Ballesteros et al., 2015; Ismail & Kuppusamy, 2018; Ribera et al., 2009). As a unified system, web accessibility could be defined as:

"all people, particularly disabled and older people, can use websites in a range of contexts of use, including mainstream and assistive technologies; to achieve this, websites need to be designed and developed to support usability across these contexts" (McConnell et al., 2014; Petrie et al., 2015)

Usually, there are certain advantages for internet users, whereas non-users of the Internet experience many disadvantages either due to the non-availability
of the Internet or due to the inaccessible format of web-based information. For those non-users who could not use the Internet despite its availability, like persons with disabilities, the solution is to improve the accessibility of internet-based information systems by using ICT based tools. Otherwise, persons with disabilities will experience a type of digital divide (Dobransky & Hargittai, 2006) which could be described as discrepancies in rates of physical access to computers and the Internet between people with and without disabilities(Gorski & Clark, 2002) or sometimes referred to as digital exclusion (Macdonald & Clayton, 2013). This digital exclusion of persons with disabilities could be reduced by making the Internet and the information available over the Internet in an accessible format based on universal design principles to a maximum possible extent. Persons with disabilities form a larger group of non-users of the Internet due to inaccessible formats of web-based information. Websites are potent sources of information and have become the daily life of individuals, but for its non-users, due to any reason, the Internet offers only limited value due to barriers inaccessibility of the websites (Kurt, 2019).

Internet access has many advantages for its users. For Internet users, it is like a virtual world in their hands through which they can perform many activities with the help of many different devices, either an extensive computer system or a handheld device. For example, the popularity of online shopping could be taken. A user of the Internet has a variety of choices to purchase certain things from anywhere in the world whereas a non-user of Internet is deprived of such advantages. Another recent example may be taken the COVID-19 vaccination. When COVID-19 vaccination was made available online slot booking, many non-users of the Internet were deprived of the vaccination due to either lack of knowledge or lack of devices. A non-user of the Internet due to any reason is impoverished of its benefits. The advantage of the Internet is that it welcomes its users and opens several countless avenues, and makes things easier for the person but on the other hand, it is a big disadvantage of the Internet and other ICT-based tools that exclude the non-users from many benefits and advantages.

Such non-users of the Internet could be classified into two broad categories: non-user of the Internet may be a person who does not have Internet available and maybe such a person who might have Internet available, but due to some of the limitations, either physiological or environmental, it is not accessible for them. The only solution for non-users who do not have Internet available is to make it available to them. However, for those non-users who could not use the Internet despite its availability, the solution is to improve the accessibility of internet-based information systems by using ICT-based tools and new developments. Such a digital divide (Dobransky & Hargittai, 2006) or sometimes referred to as digital exclusion (Macdonald & Clayton, 2013), could be reduced by making the Internet and the information available over the Internet accessible format to a maximum possible extent. Persons with disabilities form a larger group of non-user of the Internet, not due to the non-availability of the Internet but due to inaccessible formats of information available over the Internet, usually referred to as the disability digital divide
(Dobransky & Hargittai, 2006). It could be described as discrepancies in rates of physical access to computers and the Internet between people with and without disabilities (Gorski & Clark, 2002).

With the development of Information and Communication Technologies, the accessibility of web-based information has taken global attention. Several international and national guidelines have been prepared to make websites accessible for persons with disabilities, as around 5% of the world experience some form of disability. The United Nations Convention on Rights of Persons with Disabilities (UNCRPD) 2006 is a milestone in world history of disability rights. Article 9 of UNCRPD (2006) deals with accessibility issues in general and includes accessibility of web-based resources and information in particular.

It recommends that

“States Parties shall also take appropriate measures to promote access for persons with disabilities to new information and communications technologies and systems, including the Internet, and to promote the design, development, production, and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost” (UNCRPD, 2006, Article 9, Section g & h).

The big move in this area has been made by the World Wide Web Consortium, popularly known as ‘W3C’, which released Web Content Accessibility Guidelines (WCAG) and its compliance measures at various levels. Web Content Accessibility Guidelines (WCAG) 2.0 is a very comprehensive set of principles of developing and designing websites to ensure universal accessibility and for making Web content more accessible for persons with disabilities and also to older people with several types of sensory losses due to age factor (Ribera et al., 2009). The purpose of WCAG 2.0 is based on the principles of universal design, which could benefit all, including persons with disabilities, and organized around the four core principles: Perceivability, Operability, Understandable and Robust (WCAG 2.0). Many countries have adopted it, and following WCAG 2.0, Guidelines for Indian Government Websites (GIGW) version 2.0 has been prepared by the National Informatics Centre (NIC), the second edition of which is released in 2019. GIGW (2019) defines Web-Accessibility as

"Web accessibility means that people with disabilities can also perceive, understand, navigate, and interact with the Web and that they can contribute to the Web. It encompasses all disabilities that affect access to the Web, including visual, auditory, physical, speech, cognitive, and neurological disabilities” (GIGW, 2019).

Further, it affirms that the Websites and apps should be designed and developed so that they are accessible by all people, whether their hardware, software, language, culture, location, or physical or mental ability. The NIC of India prepares the GIGW 2019 has taken into account not only the World Wide
Web Consortium's (W3C's) Web Content Accessibility Guidelines (WCAG 2.0) but also the provisions of the Rights of Persons with Disabilities Act 2016 (GIGW, 2019). The Rights of Persons with Disabilities Act 2016, enacted in India in 2017, is a comprehensive act dealing with disability rights. Section 42 of the Rights of Persons With Disabilities (RPWD) Act of India mentions that:

“The appropriate Government shall take measures to ensure that:

i. all contents available in audio, print, and electronic media are inaccessible format;
ii. persons with disabilities have access to electronic media by providing audio description, sign language interpretation, and close captioning;
iii. Electronic goods and equipment meant for everyday use are available in universal design (RPWD Act, 2016)”.

Despite several international and national guidelines on web accessibility, the universal accessibility of Web-based information remains a significant challenge for both web developers and accessibility researchers. Conformance of WCAG 2.0 guidelines by web pages is significant in measuring universal accessibility (Ismail & Kuppusamy, 2018).

The profound impact of the Internet and other ICT tools on education systems has been reported worldwide (Renes & Strange, 2011) and multiplied by the COVID-19 pandemic situation. ICT tools have made their strong presence in the education system regardless of the nature of education, either informal, formal, or non-formal, and during the COVID-19 period entire world recognized the power of the Internet and ICT tools in providing education to all learners while remaining at home. It has given educational opportunities to everyone interested and brought out the education from several boundaries of geography, time, pace, etc. ICT is presented as a solution for all contemporary education and training problems (Martin, 2008). Technology has been advancing rapidly and recently, and it has become inevitable to use technology in the education sector. Because of the central importance of ICT and the Internet, it has become necessary to re-organize the education sector (Cavus, 2015) with an optimal blend of pedagogy and accessible technology.

The ongoing revolutionary changes in Information and Communication Technologies has transformed the entire Open and Distance Learning Systems too (Arulogun et al., 2020; Cavus, 2015; Guri-Rosenblit, 2005; Renes & Strange, 2011; Štošić, 2015; Weidlich & Bastiaens, 2018) which is well documented in contemporary research studies. Many researchers nowadays started defining distance learning or distance education as a system of education that usually takes place over the internet-mediated by ICT tools (Milman, 2015; Weidlich & Bastiaens, 2018). Even since its emergence, ICT tools have brought up a new generation of distance learning(Guri-Rosenblit, 2005), which is further reinforced dramatically by the COVID-19 pandemic situation during which the entire world realized the power of ICT tools like never before(Dhawan, 2020; Dwivedi et al., 2020; Thomas & Rogers, 2020). The popularity of ICT tools can be understood
as some countries have replaced face-to-face education with distance education in response to the coronavirus (Al Lily et al., 2020). Oladokun & Aina, 2011 noted that Open and distance learning (ODL) had created room for the emergence of virtual education.

The primary benefit of ICT tools-based learning is the convenience to use, i.e., using ICT tools, one can get one’s studies anywhere and everywhere. It also removes the geographical boundaries of village city-states or even countries. ICT tools enable learners to learn at their own pace, and unlike traditional face-to-face education, it is easier for learners to replay or replicate the content, store the content, and retrieve the content with more ease. In the modern era of education, the application of modern educational ICTs has a significant role (Oladokun & Aina, 2011), which is more significant if it is the case of education through open and distance learning. Open and Distance Learning (ODL) students rely majorly on the use of Information, Communication and Technology (ICT) tools for online facilitation and other activities supporting learning (Arulogun et al., 2020)

Internet-based resources in general and websites of open universities in particular play a major role in communication with learners as websites are the easiest way to find out any information, to communicate with the university, to get enrolled, to raise grievances, to access multimedia based material related to the program, to get responses on queries, to access self-learning materials, to get information related to examination and many more. Many times the first impression about an organization (and so is the Open and Distance Learning Institutions too) is almost always based on its Web site (Ismailova & Kimsanova, 2017). Websites (of open universities) are also being used as a tool for inter-and intra-organizational exchange (Astani & Elhindi, 2008) and usually a primary medium of information dissemination (Ismail & Kuppusamy, 2018; Lawrence & Giles, 1999; Potter, 2002) because of their effectiveness, efficiency, and engagement (Keller, 2008). In the present scenario, students of Open and Distance Learning are primarily dependent on the website of open universities and the higher education institutions’ Information and Communication Technology systems (Arulogun et al., 2020). Whether instructional aspects, curriculum transactions, student’s support, grievance redressal, examination, or assignment submission, a student has to be ICT-smart to be a learner of the distance education system.

One pivotal aspect which advocates the need for accessible websites of open and distance learning systems is that the emergence of and development of Open and Distance Learning systems was reinforced since its inception to provide education to those who cannot attend regular face-to-face classes due to any reason or belong to marginalized sections including persons with disabilities, persons from poor socio-economic status or marginalized group of learners due to any other reason but substantial percentages of web sites of open and Distance Learning institutions, as well as higher education institutions, continue to be inaccessible to people with disabilities. As tools and guidelines are available to evaluate and help designers and web admins make their websites accessible, it is unclear why so many sites continue to be
inaccessible (Lazar et al., 2004). Research has shown that people with
disabilities are most at risk of being excluded from access. In particular, blind
or visually impaired people who use assistive technologies such as screen
readers (Brophy & Craven, 2007) are at a greater risk of being deprived of
higher education due to inaccessible websites of open and distance learning
educational institutions.

Objectives of the Study

Gradually the study of the accessibility of universities websites has gained
the attention of researchers across the world (Astani, Marzie; Elhindi, 2008;
Ismailova & Kimsanova, 2017). It has gained the attention of few researchers
in India (Ismail & Kuppusamy, 2018), but studies focusing on accessibility of
websites of open universities in general and open universities of India, in
particular, were not found in contemporary literature. It is pertinent here to
mention that accessibility of websites is more critical in open universities than
the conventional and regular ones as learners of open universities get most of
their learning resources from the websites of respective open universities. Also,
open and distance learning fosters the larger population of marginalized
groups, i.e., dropouts, persons with disabilities etc.

As the hallmark feature of open and distance learning is to provide
education to all in general and foster the educational needs of the marginalized
group of learners in particular, the success of an open university depends upon
the accessibility features available over its website based on the principle of
universal design. The present study was intended to find out the extent to
which websites of Indian Open Universities are accessible, enabling a learner
with a disability to find out the desired information and get benefitted from
open and distance learning.

Methods

Sample

The home page of websites of all fifteen open universities of India,
including one open national university: Indira Gandhi National Open
University (IGNOU), and fifteen open state universities served as samples for
this study. The websites of all sixteen open universities of India were
investigated based on the availability of primary features of accessibility,
which were the option of Text Resize, High Contrast Text, Screen Reader
Access, Option of Word Spacing, and Language Choice Options. The language
choice option has been taken into account, considering the rich language
diversity of Indian learners.
Methodology

It was a preliminary qualitative study on accessibility features of websites of Indian open universities. The websites of all fifteen open universities were investigated manually to get the idea of immediate accessibility features available on the home page of their respective websites. Five digital accessibility features were taken into account for the present study: Text Resize, High Contrast Text, Screen Reader, Word Spacing, and options of Language Choice. The screenshot of home pages of all open universities was preserved by taking a screenshot of the website of open universities.

Data Collection and Analysis

<table>
<thead>
<tr>
<th>SI No</th>
<th>Name of the Open University</th>
<th>URL of Home Page</th>
<th>Accessibility Options</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Text Resize</td>
</tr>
<tr>
<td>1</td>
<td>Indira Gandhi National Open University (IGNOU), New Delhi</td>
<td><a href="http://ignou.ac.in/">http://ignou.ac.in/</a></td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>Netaji Subhash Open University, West Bengal</td>
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</tr>
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<td>3</td>
<td>Nalanda Open University, Patna</td>
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<td>No</td>
</tr>
<tr>
<td>4</td>
<td>OSU, Orissa State Open University, Sambalpur, Orissa</td>
<td><a href="http://www.osou.ac.in/">http://www.osou.ac.in/</a></td>
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</tr>
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</tr>
<tr>
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<td>BRAOU Ahmedabad</td>
<td><a href="https://braou.edu.in/">https://braou.edu.in/</a></td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>KKHSOU</td>
<td><a href="http://www.kksou.in/web_new/">http://www.kksou.in/web_new/</a></td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>YOU</td>
<td><a href="https://www.uou.ac.in/">https://www.uou.ac.in/</a></td>
<td>No</td>
</tr>
<tr>
<td>9</td>
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<tr>
<td>13</td>
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<tr>
<td>14</td>
<td>UPTON</td>
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<tr>
<td>15</td>
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</tr>
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<td>16</td>
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<td><a href="https://psou.ac.in/">https://psou.ac.in/</a></td>
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</tr>
</tbody>
</table>
Findings

Out of total fifteen open universities in India, dedicated to only Open and Distance Learning, seven had no accessibility features available on their home page. The list of those is as given below:

<table>
<thead>
<tr>
<th>Sl No</th>
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</tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Text Resize</td>
</tr>
<tr>
<td>1</td>
<td>Nalanda Open University, Patna</td>
<td><a href="http://www.nalandaopenuniversity.com/">http://www.nalandaopenuniversity.com/</a></td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>BRAOU Ahmedabad</td>
<td><a href="https://baou.edu.in/">https://baou.edu.in/</a></td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>KKHSOU</td>
<td><a href="http://www.kkhsou.in/webnew/">http://www.kkhsou.in/webnew/</a></td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>YOU</td>
<td><a href="https://www.uou.ac.in/">https://www.uou.ac.in/</a></td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>MABOU</td>
<td><a href="http://mpbou.edu.in/">http://mpbou.edu.in/</a></td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>THOU</td>
<td><a href="http://www.tnou.ac.in/">http://www.tnou.ac.in/</a></td>
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</tr>
<tr>
<td>7</td>
<td>PSSOU Chhattisgarh</td>
<td><a href="http://pssou.ac.in/">http://pssou.ac.in/</a></td>
<td>No</td>
</tr>
</tbody>
</table>
A closer look at data revealed that about 46% of open universities, i.e., about half the total no of open universities in India, have inaccessible websites. Further, out of the five selected primary features of an accessible website, it was observed that websites of two-state open universities have only one accessibility feature out of 5 features. Websites of three open universities were found to have met with two criteria of accessibility out of 5 criteria taken for assessment. Two open universities met three criteria, and only open universities met with four criteria of accessibility were taken for the study. None of the Indian open universities were found to have accessibility features on all the five criteria taken into consideration. If we give equal weightage to all criteria taken for consideration, seven open universities have a score of 0. Two open universities scored 20 marks Two open universities have a score of 40%, two open universities have a score of 60 %, and only one open university could score 80% on the laid down criteria in the present study. Only three open universities (20%) out of 16 open universities in India were found to meet at least three criteria of accessibility taken for this study.

Discussions & Conclusions

Here the question arises why websites of Indian Open Universities have poor accessibility features despite the several guidelines like GIGW and RPWD Act 2016? The possible answer is that the regulatory bodies of higher education, particularly Open and Distance learning have not given sufficient weightage to the accessibility features particularly accessibility of the web-based information. Recently developed framework for ODL by National Assessment and Accreditation Council (NAAC) in India has included Accessible Website as a sub-indicator of accessibility feature with a weightage of 5 marks for entire accessibility features including buildings. The Criteria VII of NAAC Manual (2019) Institutional Values and Best Practices of 100 Marks
includes Key Indicators 7.1 which is ‘Key Values and Social Responsibilities’
of 50 Marks out of which point No 84, Indicator 7.1.3 includes no of disabled-
friendly amnesties of 5 Marks (NAAC, 2019). It is interesting to note here that
Open and Distance Learning promises learners lesser face to face interaction
and more ICT based interaction. In such a situation, although accessibility of
physical infrastructure is also important, it is more important for Open
Universities to have a disabled-friendly accessible website. Thus, giving more
weightage to digital accessibility and making this a separate essential indicator
for NAAC grading of open universities may improve the situation.

Another framework of Ranking of higher education institution National
Institutional Ranking Framework has been developed by the regulator of higher
education in India, the University Grants Commission. In this ranking
framework the criteria 4 ‘Out Reach and Inclusivity’ has been given only 10%
weightage. Within this out of 100 marks, 20 marks has been given for facilities
for Economically and Socially Challenged Students and 20 Marks and
Facilities for Physically Challenged Students (PCS) 20 marks. Combining
these two criteria of inclusivity and the weightage given to these two in
institutional ranking yields overall 4% contribution in Institutional ranking.
First of all, the weightage given to this component is not consistent with the
promise of Govt of India to provide inclusive higher education and furthermore
it has no separate provision of digital accessibility feature of the institution.
The UGC need to think more weightage to Inclusivity features of universities
within which digital accessibility should be separated from physical
accessibility at least in the case of open universities.

With the development of information and communication technologies,
the growing interest of educators has been observed about the accessibility of
several websites, which is crucial in the case of open and distance learning
systems. Globally it has been taken into account to make education inclusive,
particularly the higher education system. Although the government of India
has issued guidelines to make websites of higher education institutions
accessible for persons with disabilities, the websites of open universities of
India still lack basic accessibility features. The present study was carried out
considering five basic accessibility features: Screen Reader, High Contrast
Text, Word Spacing, Text Resize feature, and language change. It was
observed that in the case of Indian Open Universities, digital accessibility
needs to be improved to a greater extent as students of open universities rely
heavily on ICT tools for various information and learning needs available
through the websites of open universities. Indian open universities have miles
to go to achieve WCAG 2.0 guidelines at ‘AA’ standard as promised by GIGW
framework of govt of India.

References

Distance education as a response to pandemics: Coronavirus and Arab culture.


