



United Nations  
Educational, Scientific and  
Cultural Organization

## UNESCO Programme: From Exclusion to Empowerment



# Learning for All:

Guidelines on the Inclusion  
of Learners with Disabilities  
in Open and Distance Learning



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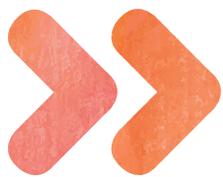
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# Foreword

In September 2015, the UN General Assembly adopted the 2030 Agenda for Sustainable Development known as the ‘Sustainable Development Goals’ (SDGs). These SDGs represent a framework for action that is universal, ambitious, and most importantly “of the people, by the people and for the people”. They underscore a prevalent global shift towards the building of sustainable Knowledge-Based societies.

SDG 4 ‘Education’ calls for the international community to “Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all’ with its key pillars of access, equity and inclusion”.

Today, over one billion people - approximately 15 per cent of the world’s population - live with some form of disability. This figure is accelerating in line with population increases, growing poverty, natural disasters, ongoing conflicts and an ageing population. Many persons with disabilities face a wide range of barriers to access education, crucial public information, public services, health care, infrastructure, and employment.

Available evidence and statistical data indicate that educational opportunities for many persons with disabilities often stop at secondary education level due to limited infrastructure and education related - facilities provided by tertiary education institutions. These limitations include the lack of financial and skilled human resources, inaccessible content, undeveloped support services as well as the high cost of assistive devices and information and communication technologies (ICTs).

As a result, there are a limited number of professionals with disabilities in key fields including science, government, law, and medicine who are able to attain decision-making positions and/or develop strategies, programmes and initiatives at local, national and international levels. Obviously, there will be a significant lag in national economic progress due to the loss of the contributions of this valuable reservoir of technical talent that remains untapped.

For this reason, unless necessary academic training opportunities, institutional facilities, content, learning and teaching process become more inclusive it will be increasingly difficult to ensure that the contributions of all citizens, including those with disabilities are part of the global effort to build inclusive Knowledge-Based Societies. Inclusiveness will only be made possible by respecting Universal Design and no-discrimination principles, information accessibility, and gender equality in the delivery of education. It is also important that actions are based on fundamental human rights and freedoms in order to meet international commitments such as the United Nations Convention on the Rights of Persons with Disabilities (2006).

We therefore have a common commitment to build on the concept of creating all-inclusive Knowledge Societies, which empower learners with disabilities to participate fully in learning processes and to integrate themselves as active and equal actors in society. This responsibility is underscores the need to ensure that national and regional educational stakeholders have the tools and capacity to put the educational needs of persons with disabilities at the heart of their national strategies for boosting social and economic growth.

This UNESCO document provides a unique set of guidelines and recommendations for all stakeholders within the field of education, information, technology and policy to take the 2030 Sustainable Development Agenda forward and empower many persons with disabilities around the world.

**Mr Lenin Moreno**

United Nations Special Envoy on Disability and Accessibility  
and former Vice-President of Ecuador

# Executive Summary

These guidelines take a contemporary standpoint on the increasingly technology-based approaches used to deliver education to persons with disabilities. In this regard, it recognizes the value of Open and Distance Learning (ODL) as one of the most sustainable methods for overcoming the educational barriers faced by persons with disabilities; it also highlights and illustrates the facets of an ODL-facilitated education system using Open Educational Resources (OERs); Free and Open Source Software (FOSS); and Open Access (OA).

These guidelines provide an overview for governments, institutions, instructors and instructional designers, along with quality assurance and qualifications recognition bodies, when developing ODL platforms, processes, courses, examination and other with a view to incorporating the needs of all users.

The guidelines have been structured in such a way that makes it easy for concerned stakeholders to navigate and assess the degree of capacity building to which they must commit to based on the contextual selection of relevant criteria. These assessments are made possible in the document by allowing Stakeholders to strategically address specific issues that may arise in the ODL delivery process—from the prerequisite actions to the implementation and the monitoring processes of educational programmes. The document includes the selection, development, use, maintenance, assessment and examination of suitable ODL platforms and tools.

This resource reiterates the commitment of the Knowledge Societies Division, Communication and Information Sector at UNESCO to support the Member States to build capacities at national and regional levels to support the development of truly inclusive national education systems and to lay the foundations for building global Knowledge Societies that pave the way for sustainable social and economic growth worldwide.



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Blind person using computer with braille computer display and a computer keyboard.

# Introduction

- 1.1 Purpose
- 1.2 Rationale
- 1.3 Background
- 1.4 Scope of the Guidelines

## 1.1 Purpose

The document addresses the role and obligations of stakeholders – governments, institutions, teachers, instructional designers, and quality assurance and qualifications recognition bodies as well as industries and developers, families and persons with disabilities - to contribute to the implementation of relevant articles (9, 21 and 24) of the United Nations Convention on the Rights of Persons with Disabilities (2006) to support access to quality learning opportunities for persons with disabilities and access to information and knowledge using inclusive, accessible and affordable solutions. It aims to promote the concrete actions for the systematic inclusion and conventionalizing of accessibility aspects via open solutions (Open Educational Resources - OER, Free and Open Source Software - FOSS and Open Access to Scientific Information - OA) in Open and Distance Learning (ODL).

This document addresses open and distance learning (ODL) in a variety of environments where education and learning are increasingly technology mediated, whether it be completely a distance or in increasingly prevalent blended framework where students use technology part of the time.

## 1.2 Rationale

### 1.2.1 Global Context

Approximately 15 per cent of the population, representing some 1 billion people in the world have a disability<sup>1</sup>. This figure is accelerating in line with population increases, growing poverty, natural disasters, ongoing conflicts and an aging population. With such a large number of people living with a disability, it is vital that access to educational opportunities be made widely available. In this regard, opportunities for open and distance learning (ODL)<sup>2</sup> may provide some solution to the difficulties faced by persons with disabilities in accessing information and education. Furthermore, access to information is recognized as one of the key fundamental human rights. Without access to reliable information and effective communication means, it is difficult to ensure an effective, inclusive and open learning process.

The Universal Declaration of Human Rights<sup>3</sup> states that all people have basic inalienable rights and fundamental freedoms that include civil and political rights, liberty and privacy, and the right to education. It is the human right to education that drives the agenda for inclusive and accessible practices and the requirement for persons with disabilities to have access to education at all levels and in all forms.

Moreover, the United Nations Convention on the Rights of Persons with Disabilities (UNCPRWD) emphasises access to education among other things as an important consideration towards making reasonable accommodation for persons with disabilities.

According to the International Labour Organization (ILO)<sup>4</sup>, the inclusion of persons with disabilities in the workforce represents a very high level of untapped human resources. An ILO pilot study of 10 low and middle-income developing countries found that the loss to gross domestic product (GDP) from the exclusion of persons with disabilities from the labour market is estimated to be between 3 and 7 per cent of GDP<sup>5</sup>.

At the EU level<sup>6</sup>, less than 1 person out of 2 with basic activity disabilities is employed. In general, the employment rate of people with basic activity disabilities in the EU-28 in 2011 was 47.3, almost 20 percentage

1 World Health Organisation (2013)

2 The term 'Open' in Open and Distance Learning (ODL) refers to "...any scheme of education or training that seeks systematically to remove barriers to learning, whether they are concerned with age, time, place or space. With open learning, individuals take responsibility for what they learn, how they learn, where they learn, how quickly they learn, who helps them and when they have their learning assessed" (Distance Learning UK, 2003, para 1). The use of open in open solutions refers to software and courseware that is freely available, or open, to all users, at prescribed levels of access

3 United Nations

4 [http://www.un.org/disabilities/documents/hlmdh/hlmdh\\_ilo.pdf](http://www.un.org/disabilities/documents/hlmdh/hlmdh_ilo.pdf)

5 Backup, S. (2009). The Price of Exclusion: The Economic Consequences of Excluding People with Disabilities from the World of Work, Employment Working Paper No. 43 (Geneva, ILO)

6 [http://ec.europa.eu/eurostat/statistics-explained/index.php/Disability\\_statistics\\_-\\_labour\\_market\\_access](http://ec.europa.eu/eurostat/statistics-explained/index.php/Disability_statistics_-_labour_market_access)

points below that of people without such difficulties. One of the main reasons mentioned for this disparity was “education or training”. Adequate learning opportunities that take into account issues of inclusion and accessibility are vital to ensure that all citizens, including those with disabilities are active participants and contributors to economic and social growth in increasingly technology based Knowledge Societies. Actions to support accessibility, such as ensuring that the principles of Universal Design for Learning (UDL) benefit all members of society by improving the quality of learning for all members of society.

With the prevalence of the use of technologies in all aspects of society, and specifically for educational purposes, new opportunities to overcome challenges to the inclusion of learners with disabilities in education become increasingly possible. Reasonable anticipatory accommodations - modifications or adjustments to the tasks, and the environment that enable individuals with disabilities to have an equal opportunity to participate in an academic program or a job (U.S. Department of Education, 2007) are important<sup>7</sup>. In this regard, Assistive technologies (AT) provide an opportunity for people with disabilities in educational settings (students, instructors and institutional staff with disabilities) to access information and knowledge.

This document emphasizes both policy and legal obligations of different stakeholders to provide inclusive education to persons with disabilities, with the understanding that reasonable accommodation should be a ‘pre-existing’ obligation. In this regard, accessibility issues should be considered from the beginning of the planning cycle for any educational process. While policies do exist, including some provisions for accessibility, the main issue has been increasingly whether there are legal implications to ensure that they are implemented, including related incentive measures for their implementation.

The wide range of available open and distance learning (ODL) methods, in tandem with open educational resources (OER), open access to scientific information (OA), free and open source software (FOSS), and other accessible and inclusive technological solutions, can enable persons with disabilities to learn and contribute knowledge and skills to their communities as well as change negative attitudes, stigma and discrimination.

### 1.2.1 Research

Wide-ranging research on open and distance learning exists, and many peer-reviewed and non-peer-reviewed journals publish this research on a regular basis<sup>8</sup>, although there is less research on persons with disabilities enrolling in ODL (e.g. hearing impairment<sup>9</sup>, learning disability<sup>10</sup>, physical impairment<sup>11</sup>).

The research indicates that increasing numbers of persons with disabilities are enrolling into distance education courses and that there is huge potential for ODL to have a significant impact on the educational pathway of many persons with disabilities.

The increasing availability of ODL, coupled with technological advances that allow information to be presented in a variety of ways, may assist persons with disabilities to overcome some of the barriers to learning they face. These barriers include:

- geographical distance;
- mobility difficulties (including fine motor control);
- sensory issues (vision, hearing);
- learning or cognitive difficulties;
- speech and language difficulties;
- lack of access to appropriate resources;
- lack of disability-friendly infrastructure;
- cultural factors (e.g. parent involvement, stigma and discrimination);
- linguistic differences;
- social and emotional difficulties;
- equal educational opportunities;
- free and low-cost education;
- availability of trained, experienced staff/ educational professionals;
- lack of assistive technology;
- economic factors.

7 <http://www.apa.org/pi/disability/dart/toolkit-three.aspx>

8 Appendix 2 provides a list of available journals

9 Mpofu, Chimhenga & Mafa (2013)

10 Heiman (2006)

11 Karal, Cebi & Turgut (2011)

The literature also highlights the need for developers and educators to plan ODL effectively to ensure that students with disabilities experience as few barriers as possible in their learning setting. Absent from the literature on ODL and persons with disabilities is specific reference to attitudinal barriers, which are often the cause of other barriers, such as access barriers, communication barriers, information barriers, and physical or structural barriers. It is important to note that without the use of Assistive Technologies (AT), persons with disabilities will have limited access to learning content and will not be able to fully participate in learning processes – in short learning opportunities will be substantially limited.

## 1.3 Background

### 1.3.1 UN Convention on the Rights of Persons with Disabilities

*The UN Convention on the Rights of Persons with Disabilities* (UNCRPWD) definition of persons with disabilities includes those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others (UNCRPWD, 2006, Article 1, para. 2).

The following Articles of this UN Convention are directly linked to issues related to ODL and education:

- **Article 3 – General Principles** of the *UN Convention on the Rights of Persons with Disabilities* (2006) provides general principles for the enjoyment of all rights in the convention and expresses these principles as:
  - Respect for inherent dignity, individual autonomy including the freedom to make one's own choices, and independence of persons;
  - Non-discrimination;
  - Full and effective participation and inclusion in society;
  - Respect for difference and acceptance of persons with disabilities as part of human diversity and humanity;
  - Equality of opportunity;
  - Accessibility;
  - Equity between men and women;
  - Respect for the evolving capacities of children with disabilities and respect for the right of children with disabilities to preserve their identities
- **In Article 4 – General Obligations**, States Parties are called upon to:
  - Adopt appropriate legislative and administrative measures for the implementation of the rights recognised in the Convention;
  - Take into account the protection and promotion of the human rights of persons with disabilities in all policies and programmes;
- Ensure that public authorities and institutions act in conformity with the Convention;
- Take all appropriate measures to eliminate discrimination on the basis of disability by any person, organization or private enterprise;
- Promote universal design in the development of standards and guidelines;
- Undertake or promote research and development of, and promote the availability and use of new technologies, including ICT mobility aids, devices and assistive technologies, suitable for persons with disabilities.
- Provide accessible information to persons with disabilities about mobility aids, devices and assistive technologies as well as other forms of assistance, support services and facilities.
- **Article 9 – Accessibility** including access to ICT and technological systems
- **Article 21 – Freedom of expression and opinion and access to information**
  - Provide information in accessible formats and encourage others in private organisations to do so
- **Article 24 – Education**
  - Persons with disabilities are not excluded from the general education system.

Countries which ratified the UNCRPD should provide reasonable accommodation of persons with disabilities' needs, including making education inclusive to all as well as ensuring that information using information and communication technologies (ICT) is accessible.

### 1.3.2 Open and Distance Learning (ODL)

ODL is a broad term that embraces online learning, e-learning, distance education, correspondence education, external studies, flexible learning, and massive open online courses (MOOCs) movement. For the purposes of this paper, ODL will be defined as a learning that incorporates these main features:

- Teacher-learner separation by space and time (or both)
- Two-way communication and group communication (network)
- The use of media and technology
- More personalised educational experience<sup>12</sup>

The development of ODL has been enhanced through increasing use of technology to support both the user and the facilitator of the learning. Interactive technology-based (digital) educational resources are increasingly being developed for both distance and blended learning options and this trend is likely to accelerate in the future. The interactive nature of many technology-based learning tools serves to engage learners and stimulate learning<sup>13</sup>.

ODL can address issues that persons with disabilities may face such as geographical distance from centres of learning, issues with sensory systems (e.g. vision, hearing), and mobility difficulties (e.g. physical disabilities), as well as gender<sup>14</sup> and cost factors. While these guidelines concentrate on ODL for persons with disabilities, they are relevant to all learners to a large extent.

### 1.3.3 Open and Inclusive Solutions

Open solutions include materials, strategies, processes and technologies that are available on an open licence and can be used (and reused) by any person<sup>15</sup> to enhance learning by increasing access to resources and learning experiences. There are a number of levels of openness which include (in order of increasing openness) - reuse, redistribution, revising and remixing<sup>16</sup>. Universal availability and access are vital components of open solutions.

It is important to note that Open Solutions are not inherently accessible. An objective of this document is to raise awareness of the importance of accessibility and support the development of accessible Open Solutions. This document underscores that accessibility should be an integral part of policy related to Open Solutions. These guidelines focus on the most common open solutions for education: Open Educational Resources (OER), Free and Open Source Software (FOSS), and Open Access to Scientific Information (OA<sup>17</sup>).

#### Open Education Resources (OER)

Open Educational Resources (OER) are any type of educational materials that are in the public domain or introduced with an open licence<sup>18</sup>.

OER range from textbooks to curricula, syllabi, lecture notes, assignments, tests, projects, audio, video and animation. OER "...allow users to legally and freely use, copy, adapt, and re-share"<sup>19</sup>.

While OER are generally freely available to use and to share, the author maintains intellectual property over the materials<sup>20</sup>. A Creative Commons licence<sup>21</sup> (or similar) indicates how the resources can be used, and whether any adaptation of the material is allowed. OER call for attribution of author of the work, while allowing for the sharing of other rights such as that of translation, sharing and/or adaptation.

12 Spector (2009)

13 Shank (2014)

14 Laad (2012)

15 Abeywardena (2012)

16 Hilton, Wiley, Stein & Johnson (2010)

17 Appendix 4 provides a list of Open Solutions that can be used as assistive technologies

18 UNESCO (2014)

19 UNESCO/COL (n.d.), p. 2

20 Butcher, Kanwar & Uvalic-Trumbic' (2011)

21 See <http://creativecommons.org/> for further information

The Paris Declaration on OER (2012) describes a number of key international conventions and statements that lend support to the use of OER for persons with disabilities, including the Universal Declaration of Human Right, the Dakar Framework for Action on Education for All and The Convention on the Rights of Persons with Disabilities.

### **Free and Open Source Software (FOSS)**

Free and open source software (FOSS) refers to software that has been designed by a person or group, openly modified and then distributed freely for use.

The source code (basic underlying programming) of the software can generally be changed and shared within specific licence conditions<sup>22</sup>. FOSS products are licenced in a way that they can be freely used, studied, shared, and improved<sup>23</sup>. The open source concept has resulted in the development of online encyclopaedias (Wikipedia), and Open Educational Resources (OER). The goal is to continuously improve the product through user input.

### **Open Access to Scientific Information (OA)**

Open access to scientific information (OA) is the provision of free access to peer –reviewed scholarly and research information to all<sup>24</sup>.

OA requires that the copyright holder grants worldwide right of access to copy, use, distribute, transmit and make derivative works in any format with proper attribution to the original author. OA uses information and communication technology (ICT) to increase and enhance the dissemination of scholarship.

With OA, researchers and students can gain increased access to knowledge, authors have greater access to audiences and the potential impact of research is heightened. OA improves the sharing of knowledge and leads to opportunities for economic and social development that may have not been recognised.

## **1.4 Scope of the Guidelines**

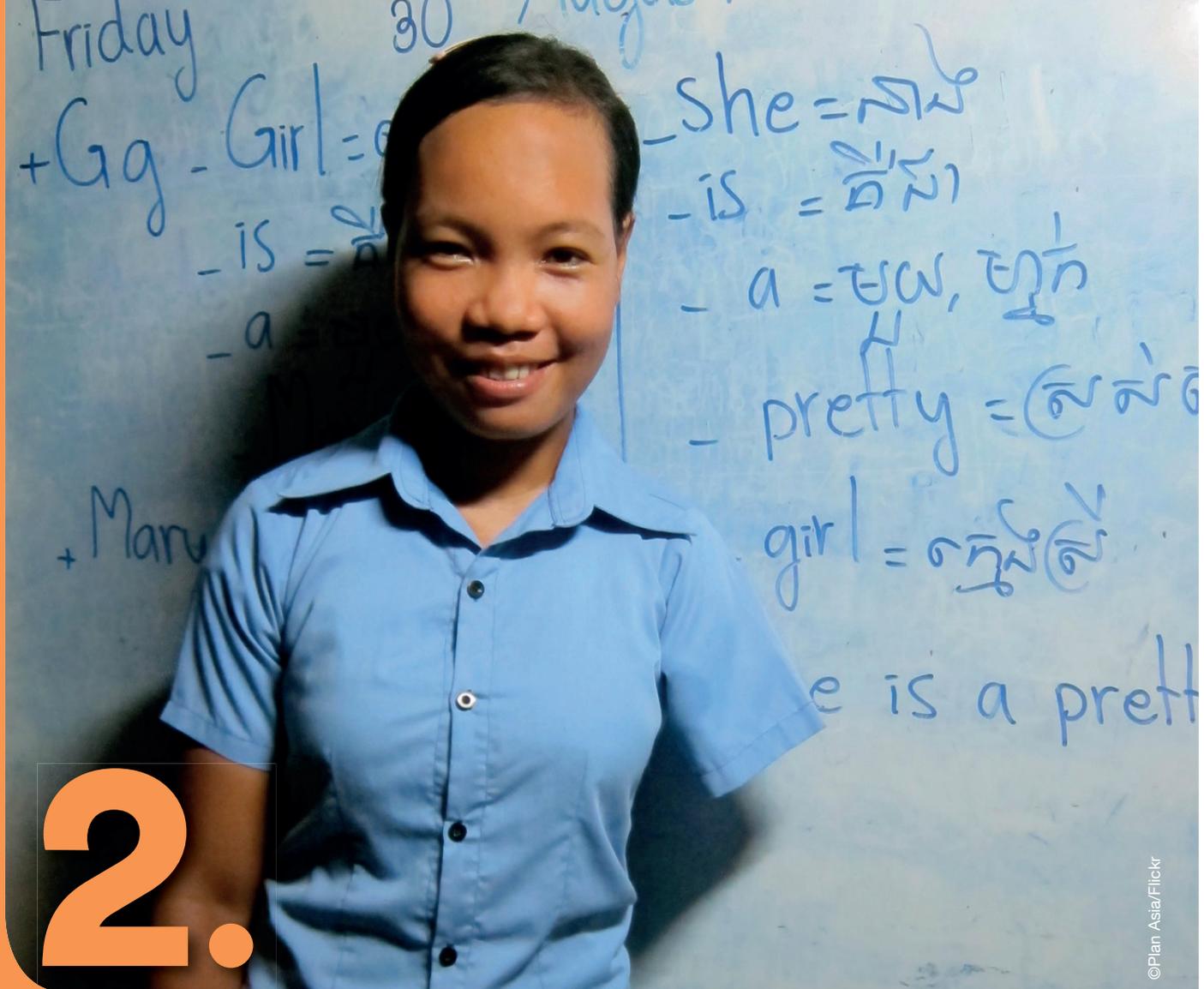
UNESCO in close collaboration with other international, regional and national partners has developed these guidelines to provide recommendations to the above-mentioned stakeholders. These include governments, institutions, instructional designers, teachers and quality assurance and qualifications recognition bodies as well as industry and developers, families and most importantly, persons with disabilities. Their aim is to support access to quality learning opportunities for persons with disabilities through ODL by harnessing open solutions (OER, OA, and FOSS).

The document provides two sets of guidelines. The first part provides specific recommendations to policy makers at governmental level, educational institutions, instructional designers, and quality assurance and qualifications recognition bodies, as well as industry and developers. The second provides a Matrix of Actions addressing issues that may be of value to educational stakeholders through the implementation of the educational delivery process. In view of the fast developing nature of the technology field, the references to the technology tools in this document are intended to serve as a starting point for persons searching for ICT solutions. The issues covered apply to all levels of education, both formal and non-formal in a context of lifelong learning as well as targeting disability-specific and disability mainstreaming initiatives.

22 See <http://opensource.com/> for further information

23 UNESCO (2013). UNESCO global report: Opening new avenues for empowerment. Retrieved from <http://unesdoc.unesco.org/images/0021/002197/219767e.pdf>

24 UNESCO (n.d.). Open access. Retrieved from [http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/images/GOAP/3544.11\\_CI\\_E\\_Open%20Access%20brochure.indd.pdf](http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/CI/CI/images/GOAP/3544.11_CI_E_Open%20Access%20brochure.indd.pdf)



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Girl student standing in front of white board with writing.

# Guidelines for Educational Stakeholders

- 2.1 Introduction to the Guidelines
- 2.2 Guidelines for Governments
- 2.3 Guidelines for Educational Institutions Delivering ODL
- 2.4 Guidelines for Instructors
- 2.5 Guidelines for Quality Assurance and Qualifications Recognition Bodies

## 2.1 Introduction to the Guidelines

The UNCRPD highlights the importance of reasonable accommodation of persons with disabilities' needs, including in education and information processes. The development of such guidelines is an attempt to ensure that ODL is inclusive for students with disabilities and provides relevant stakeholders with information in the most systematic manner with reasonable accommodation of the special needs of students with disabilities. The reasonable accommodation requires some harmonization and standardization action. It is intended that this document will support the sharing of good practices and solutions to common problems to support inclusive practices for delivering ODL.

It is recognized that all stakeholders are responsible for ensuring inclusive access to learning. Communication between the educational community and the capacity building for all stakeholders are key elements for the success of initiatives in this area.

These guidelines may also lead to the development of standard procedures for the ODL institutes. The current document does, however, propose recommendations only, but could potentially be used for the development of new standard procedures at a later stage. This does not imply development of international normative instruments such as recommendations, conventions or treaties, but practical standards for procedures. The task of standard-setting begins with a review of key concepts, definitions, classifications and methods as well as existing solutions used by various stakeholders in different countries, in order to identify challenges and barriers, and potential procedures which could be harmonized to support standardized procedures for further development of common approaches. It is also important to state that legitimacy of the standard procedures is supported when performance standard is linked to the requirement of practice. By providing the guidelines and aligning them to the teaching and learning process, curriculum and content development, the application of technological solutions and related aspects, this document aims to provide important arguments for the establishment of more standardized procedures

## 2.2 Guidelines for Governments

Governments play a crucial role in providing access to ODL for persons with disabilities. Governments provide legislative and policy direction to institutions and instructors, while industry provides appropriate support and materials to enable access. This legislative and policy role often requires for inter- and cross-ministerial collaboration and coordination.

Within the context of the UNCRPD, national governments are key players in the ratification and implementation process. Governments which ratify the UNCRPD are expected to set strategic plans aligned and harmonized with national development goals and priorities with allocated resources for its implementation. The UNCRPD, as a comprehensive normative framework, includes a number of General Obligations (Article 2, 3 and 4) requesting governments to progressively adopt appropriate legislative, administrative and other measures. Therefore, Governments provide legislative and policy directions to educational institutions, while industry provides appropriate support and materials to enable access to information and knowledge. Governments also have responsibility for providing infrastructure such as broadband networks and communication systems within a country. Few other General Obligations include direct reference to the use of inclusive ICTs and ATs in education (Article 2, 9, 21 and 24) calling for adoption of inter-connected actions in legislative and policy fields.

However, the extent to which governments have mainstreamed needs of persons with disabilities in national educational strategies and policies is uneven across countries, and significant challenges remain. With regards to the national educational policies and strategies, governments have the key responsibilities to ensuring that disability and accessibility aspects are equally mainstreamed within educational settings starting from early childhood to higher education, including through ODL, in both formal, non-formal and informal education in a lifelong learning perspective.

In this context it is suggested that Governments address the areas below:



- **Legal and policy provisions:** Support and foster legislation and/or policy development to ensure persons with disabilities are included in Open and Distance Learning (ODL). Such policies should address monitoring of implementation and compliance to appropriate standards, procedures and mechanisms.
- **Funding:** Ensure adequate funding is provided to ensure the smooth functioning of an enabling environment required for the inclusion of persons with disabilities in ODL.
- **Cooperation and partnership.** Facilitate liaison amongst all stakeholders in ODL including for sharing of good practice, Governments are central to ensuring inter-ministerial cooperation between relevant stakeholders in different sectors such as education, health, social affairs, technology, infrastructure and employment to clearly address the rights of learners with disabilities. An important aspect of this to support the application of principles of Universal Design for Learning by all stakeholders to support educational delivery.
- **Access to Assistive Technologies (AT) and inclusive ICT:** Facilitate access of persons with disabilities to AT and ICT to enhance learning through ODL. It should also include provisions for procurement of inclusive technology, as well as the development of tools and services adapted to the needs of persons with disabilities.
- **Research:** Support research and development on the use of FOSS, OER and OA for improving accessibility of open solutions.
- **Infrastructure:** Facilitate and strengthen the development and use of appropriate infrastructure for persons with disabilities in ODL.
- **Capacity building:** Support the training of instructors, support staff and IT administrators on accessibility issues, and AT, OER, OA and FOSS to effectively work with students with disabilities in ODL.
- **User-targeted work:** Work together with organisations and associations for persons with disabilities to identify difficulties and solutions to access inclusive ODL. Special attention should be paid to the empowerment of women and young girls with disabilities who may face multiple discrimination and stigma.
- **Standard procedures:** Require quality assurance and qualifications recognition bodies to include accessibility-related quality assurance issues.
- **Training and learning materials:** Consider ensuring that Universal Design for Learning, accessibility aspects for students with disabilities including Open Solutions are an integral part of the national teacher training curriculum (initial and in-service).

## 2.3 Guidelines for Educational Institutions Delivering ODL

Educational institutions often make key decisions in regards to the main content, and the platform used for the ODL courses. For this reason, the following guidelines, based on the matrix of actions (Table 1), may serve to inform the decisions made in these areas. It is also important to ensure that mainstreaming of accessibility and Universal Design for Learning (UDL) issues should be considered within a broader educational context. While educational institutions must recognise that teaching and learning provision should accommodate the needs of students with disabilities as disability-specific interventions, it is important that educational institutions aim to introduce and implement policies, procedures and standards that respect accessibility and inclusion-based solutions for all students, . As there are many individual differences within conditions, it is inappropriate to provide support based on disability category alone as it is essential to identify existing common challenges and barriers in a coherent and systematic manner taking into account inclusive design and learning principles. In this context it is suggested that educational Institutions address the areas below:



- **Enrolment:** Give deliberate consideration to the enrolment of persons with disabilities in ODL, using accessible open solutions at all steps throughout the enrolment process (from access to public information on course offer, to registration, entrance exams, and face to face interviews to acceptance).
- **Needs assessment:** Ensure assessment of all students with disabilities, to provide full access to the programme.
- **Strategy and internal disability policy:** Ensure strategies and internal disability policies for the systematic inclusion of students and staff with disabilities, (including recruitment, adjustments of the workplace) are in place. This would include examining the roles of different stakeholders as well as processes and technology within an institution. Other issues are procurement policy, the development and maintenance of accessible content and technology.
- **Content:** Ensure that content is designed for all students with a variety of needs and in different contexts by applying the principles of UDL.
- **Integration of open solutions:** Examine the integration of FOSS, OER and OA in programme design and delivery with a view to addressing accessibility issues.
- **Removal of barriers:** Ensure that assistive technology is able to remove barriers to learning, including, but not limited to, cognitive, physical and sensory barriers This includes the recognition of the responsibilities of all departments of educational institutions to remove barriers to accessible learning by utilizing the principles UDL.
- **Training:** Consider and address training requirements of students, faculty and other professionals, for accessible content and technology.
- **Efficacy:** Ensure that regular feedback, monitoring and evaluation mechanisms are in place.
- **Support services:** Establish knowledgeable support services, including the identification and provision of financial support, and inform all participants.
- **Compliance:** Ensure the deployment of good practices supported, recommended and/or required by quality assurance bodies and recognition agencies.

## 2.4 Guidelines for Instructors

Instructors and other teaching personnel are tasked to ensure that students are able to access content and required learning resources as well as to guide them through the course to achieve the expected learning outcomes. They are key to making decisions regarding the pedagogy used to convey content, format of discussions and student progress<sup>25</sup>. Instructors are generally the people most aware of the needs of students with disabilities, and are able to propose necessary adjustments as required while the course is active, including directing students to appropriate OER, FOSS and OA materials where applicable. Furthermore, they are able to monitor students' progress and learning experience and make necessary modifications to their teaching as necessary to ensure continuous improvements. Due to the proximity of Instructors to students, they are best placed to convey to the educational institution (e.g. support staff, IT administrators) the need for any additional adjustments required in different aspects of the institution to ensure that students have access to learning facilities and are able to achieve the learning outcomes. In this context, it is suggested that Instructors address the below areas as follows:



- **Awareness:** Seek information from all students on their needs and functional capabilities to provide timely, accurate and relevant support and make necessary adjustments to the learning process and learning environment.
- **Tutoring and learner support:** Include appropriate pedagogies which are accessible to students with disabilities, making individual effective adjustments as required, including the application of Open Solutions and inclusive technology.
- **Accessibility integration:** Integrate accessible open solutions in ODL that are in compliance with accessibility standards (e.g. technical, physical infrastructure standards) at all stages of development and implementation.
- **Assessment:** Ensure compliance with accessibility criteria supported, recommended and/or required by quality assurance bodies and recognition agencies.
- **Effective communication:** Facilitate periodic contact with students to assess progress.
- **Periodical review of content accessibility:** Ensure that content is regularly monitored to be in compliance with accessibility standards and ensure modifications as necessary.
- **Monitoring:** Integrate mechanisms for student participation in course design through ongoing feedback and analytics as well as formal course review. Collect and collate data on student experiences and their needs to improve further iterations of course offer.
- **Professional development and exchange of knowledge:** Keep up to date on research findings and empirical evidence in the field of accessibility, and apply them where possible in professional practice. Participate in the exchange of good practices between peers in the professional community

## 2.5 Guidelines for Quality Assurance and Qualifications Recognition Bodies

Quality assurance and qualifications recognition have become key elements for supporting the overall relevance and value of learning offered.

Quality is primarily the responsibility of higher education institutions; external quality assurance bodies play an essential role in fostering a quality culture through the establishment of standards and criteria and the assessment of programmes and reviews of institutional quality assurance mechanisms. When assessing the quality of a HEI or a programme, quality assurance bodies normally consider the qualifications of the teaching staff, the teaching and learning resources and the mode of educational delivery within their analysis of the fitness for purpose of the overall educational experience. Quality assurance bodies therefore have a role in ensuring that policies are in place to support the needs of students with disabilities in a manner that promotes quality teaching and learning.

Qualifications recognition is a formal acknowledgement by the relevant authority of the value of a qualification for a particular purpose, whether gained in-country or overseas. Recognition authorities should endeavour to adhere to the principles established in UNESCO's regional recognition conventions, which include fairness and non-discrimination in assessments, assessment of non-traditional learning modes, and sharing of information on higher education systems, quality assurance and qualifications between relevant bodies<sup>26</sup>. Recognition authorities should also have an understanding of issues related to ensuring the inclusion of students with disabilities in learning environments in general, and for the purposes of these guidelines, in open and distance learning frameworks in particular. The missions of quality assurance bodies and recognition authorities are closely linked and recognition authorities often rely on information provided by quality assurance bodies. In this context it is suggested that quality assurance and qualification recognition authorities address the below areas:



- **Application of non-discriminatory recognition.** Apply principles of fair and non-discriminatory recognition of qualifications undertaken in non-traditional modes (such as online and distance learning) established in UNESCO's regional recognition conventions.
- **Awareness raising.** Develop understanding of issues related to ensuring the inclusion of persons with disabilities. This would include highlighting the benefits of inclusiveness and the provision of a wider range of learning experiences.
- **Standard setting.** Include across quality standards and criteria explicit provisions to make learning accessible to a wide diversity of students including persons with disabilities.
- **Retention and learning outcomes.** Quality standards must require HEI to have mechanisms in place that provide all enrolled students with effective opportunities for retention and graduation, and that ensure that all graduates have achieved equivalent learning outcomes regardless of the mode of delivery.
- **Continuous improvement of QA processes by QA agencies.** Consider the particular areas where quality assurance and recognition criteria and procedures may need to be revisited to ensure quality teaching and learning for persons with disabilities in their higher education experience, including ODL.
- **Phased implementation.** QA agencies should work with HEI for a phased implementation of inclusive practices, such as capacity building for academic staff, student services, delivery modes, instructional materials and resources, physical facilities.
- **Sharing of good practices:** QA agencies should ensure the collection and dissemination of good practices to support the ongoing improvement of the quality of ODL offers.

<sup>26</sup> See in particular the 1997 Convention on the Recognition of Qualifications concerning Higher Education in the European Region, the 1983 Regional Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in Asia and the Pacific and the 2011 Asia-Pacific Regional Convention on the Recognition of Qualifications in Higher Education.



Deaf woman and girl talking using sign language on the smartphone's cam.

# Matrix of Actions for Educational Delivery

**3.1 Universal Design for Learning**

**3.2 Matrix: Prerequisite Actions, Implementation Actions, Monitoring Processes**

## 3.1 Universal Design for Learning (UDL)

Universal Design for Learning (UDL) refers to a process in which a curriculum (goals, methods, materials and assessments) are intentionally designed to offer flexible and inclusive approaches that can be customized and adjusted for individual needs. The key components of UDL are to ensure flexibility and accessibility in the ways information is presented, the way students respond or demonstrate knowledge and skills, and the way they are engaged in the learning process (e.g. with the course content, interactions with peers, and instructors etc.); and in addition to reduce the barriers in instruction by providing appropriate accommodations, supports and challenges while maintaining high achievement expectations for all students.<sup>27</sup>

There are barriers that current technology can erect for persons with disabilities. While technology may provide more information to learners in a greater variety of ways, it does not necessarily allow all users to access learning environments and information equally<sup>28</sup>. The Web Content Accessibility Guidelines, released by World Wide Web Consortium (W3C, 2008), not only target web content and tool developers to design appropriate websites and web-based resources for a diverse range of users but is also an important tool for ensuring UDL principles in access to web-based resources for persons with disabilities. Students with disabilities must have access to all components of the learning process (including registration, administrative matters, course work and other) that would be available to students without a disability, and teachers should have positive attitudes and use appropriate pedagogy.

The Matrix discussed in section 3.2 below outlines further elements of UDL that are suggested for inclusion to ensure the accessibility of ODL for students with disabilities.

## 3.2 Matrix: Prerequisite Actions, Implementation Actions, Monitoring Processes

In order to make ODL accessible for persons with disabilities, a number of actions at all stages of the learning process are necessary. The following actions relate to the different phases of the learning process; prerequisite, implementation and monitoring processes needed to be considered. These actions would benefit all students regardless of their ability.

While there are specific considerations for government (e.g. infrastructure legislation/policy), industry (e.g. website designers, tool developers), institutions (e.g. courseware designers), and instructors (e.g. teachers, lecturers), it is useful for all parties involved in ODL, including persons with disabilities, to have a common understanding of each phase of development, and the actions involved in each phase.

This section is made up of 3 components:

- Table 1. provides a matrix of prerequisite actions, implementation actions and monitoring processes for designing ODL for open solutions for persons with disabilities;
- Section 3.2.1 provides key considerations for each of the elements of this Matrix; and in addition in the Appendix section,
- Appendix 5, 6 and 7 provide checklists for each of the elements of the Matrix which can be contextualized to fit different purposes as needed.

<sup>27</sup> <http://www.udlcenter.org/aboutudl/udldefined>

<sup>28</sup> Hashey & Stahl (2014)

**Table 1. Matrix of prerequisite actions, implementation actions and monitoring processes for designing ODL with open solutions for persons with disabilities. Include monitoring at all levels.**

1 Platforms	Prerequisite Actions	Implementation Actions	Monitoring Processes
	<ul style="list-style-type: none"> <li>- Determine an overall institutional vision and commitment to ensuring accessibility for men and women in all aspects of ODL delivery</li> <li>- Establish an institutional policy concerning platforms for learning which secures the engagement of all relevant institutional stakeholders and that is appropriate for serving the needs of students, academics and administrative staff with disabilities</li> <li>- Where possible build on good practices on policy and practice available</li> <li>- Appoint a responsible person or office with adequate authority to ensure the implementation of the policy concerning the platform chosen</li> <li>- Develop accessible resources and standards in anticipation of a wide range of needs of students, academic and administrative staff</li> <li>- Determine a process for selecting accessible technology and content which involves platforms, content and modalities. This would be included in relevant procurement guidelines</li> <li>- Develop appropriate training for all members of the institutional community involved (including students, academic and administrative staff)</li> </ul>	<ul style="list-style-type: none"> <li>- In all implementation maintain a coherence in actions concerning platforms and content actions. Ensure that actions are fragmented and remain cohesive throughout the system</li> <li>- Availability of platforms and technologies</li> <li>- Instructors and student preparedness</li> <li>- Continuous evaluation and feedback from a variety of users</li> <li>- Availability of platforms</li> <li>- Application of training</li> <li>- Trial with a wide variety of users</li> <li>- Creation of awareness on policy, legislation and options available in training and software</li> <li>- Take into consideration gender equality issues when ensuring accessibility to platforms</li> </ul>	<ul style="list-style-type: none"> <li>- Obtain feedback from users</li> <li>- Update where required with FOSS</li> <li>- Add additional platform functionality if required</li> <li>- Conduct periodic assessment to determine conformance to accessibility policy and agreed upon standards and user satisfaction</li> <li>- Make necessary adjustments based on assessment results</li> <li>- Take into consideration gender equality issues when monitoring</li> </ul>

<b>2</b> <b>Content</b>	<b>Prerequisite Actions</b>	<b>Implementation Actions</b>	<b>Monitoring Processes</b>
	<ul style="list-style-type: none"> <li>- Establish a policy on the use of accessibility criteria in curriculum development and course materials and any other materials provided to learners</li> <li>- Provide capacity building to concerned staff on the development of accessible content</li> <li>- Ensure a mechanism for internal review of course content conformance to accessibility standards and user needs before public launch of content materials</li> <li>- Examine the context in which the learning will take place</li> <li>- Include available OER and OA resources in structuring content</li> </ul>	<ul style="list-style-type: none"> <li>- Regularly check accessibility of content, including OER, FOSS and websites</li> <li>- Ensure all users can access materials/content</li> <li>- Adjust content immediately according to user feedback</li> <li>- Collect data about student learning experiences</li> <li>- Provide ongoing support and capacity building as necessary to staff concerned to provide accessible inputs</li> <li>- Avoid gender stereotypes when developing accessible content</li> </ul>	<ul style="list-style-type: none"> <li>- Monitor progress of users</li> <li>- Identify and address reasons resulting in non-completion, non-attainment of learning objectives</li> <li>- Use satisfaction data and feedback from students to improve access to content</li> <li>- Incorporate perspectives from a variety of users (learners with different disabilities, instructors)</li> </ul>

<b>3</b> <b>Modalities</b>	<b>Prerequisite Actions</b>	<b>Implementation Actions</b>	<b>Monitoring Processes</b>
	<ul style="list-style-type: none"> <li>- Ensure the course is accessible for a wide range of users by using UDL and ODL principles</li> <li>- Capacity building for instructors in different modes of teaching and learning including ODL on how to produce accessible content</li> <li>- Address gender equality in all development processes</li> </ul>	<ul style="list-style-type: none"> <li>- Use accessible support service or help-line such as video, text and voice feedback for students and instructors to support persons with disabilities</li> <li>- Replace inaccessible content with a reasonable alternative to accommodate a wide range of different modalities</li> <li>- Support research initiatives for accessibility issues</li> <li>- Ensure that support services are equally available and accessible to both men and women with disabilities. If needed, make any necessary adjustments</li> </ul>	<ul style="list-style-type: none"> <li>- Collect data on a wide variety of user experiences of the ODL</li> <li>- Monitor gender equality to accessing physical environments</li> <li>- Develop a database of potential solutions to difficulties experienced</li> <li>- Develop a database of conformance of platforms/ software to technical/ accessibility standards</li> <li>- Troubleshoot difficulties experienced</li> <li>- Re-examine materials on a regular basis to address changes in catering for modalities</li> <li>- Keep abreast in international standard development and make necessary adjustments</li> <li>- Provide feedback to users</li> </ul>

### 3.2.1 Prerequisite Actions

Prerequisite actions require the establishment of a wide ranging institutional policies, covering from admissions to graduation, including curricular and extra-curricular activities.

#### Selecting Platforms

There are a number of actions that institutions, teachers and instructional designers must take prior to the procurement of appropriate platforms, development and dissemination of ODL resources that may be used by persons with disabilities. These actions include:

- reflecting constitutional, legislative and policy (such as non-discrimination policies) requirements;
- considering non-proprietary platforms, where possible using open solutions;
- considering of the types of platforms that users will be accessing (Windows, Mac, tablet devices, paper-based) and respect accessibility standards;
- reviewing characteristics of the platforms and devices (operating system, language used) including accessibility criteria;
- determining whether training is required to use the platforms and devices to access the ODL.

The type of platform will define to what extent accessibility will be ensured and processes and content will be inclusive. It is therefore essential to ensure that from an early stage, starting from development and procurement phases, the principles of accessibility would be respected and taken into consideration.

Accessibility should be seen by those who are responsible for making decisions about which products, services and content to procure as one of the key criteria for acquisition. For the procurement of accessible products, be they IT, platforms, devices, content or services, the following steps should be respected: (i) procurement announcements should include accessibility as one of the criteria; (ii) vendors should provide information about the accessibility of their products; (iii) assessment of the proposal should include evaluation of accessibility as part of the proposal by vendor. If at early stage of development and procurement, accessibility is not included as a prerequisite action, it is difficult and in some cases nearly impossible to ensure it at later phases.

#### Devising Content

The content must be developed with a logical structure around stated outcomes. Clear policies or legislation will guide all stakeholders involved in developing content to take into account the needs of persons with disabilities. When developing content consideration must be made for:

- access to training may have to be included in the content of the ODL to ensure that learners can negotiate specific software or systems to access the content, which may consist of providing students with disabilities with digital and information literacy instruction;
- the language used in the materials will need to be examined to ensure it is accessible to all students.

Students who utilise additional assistive technology to access online materials may have difficulty when trying to use assistive technology alongside the online material. Solutions include using:

- only accessible formats such as accessible EPUB<sup>29</sup>, Text or Open Document Format Digital Accessible Information System (DAISY)<sup>30</sup>, or accessible pdf;
- mainly asynchronous features (i.e. not using instant response chat rooms);
- pedagogical agents within the online learning material to assist the learners (e.g. sequencing and chunking of materials);

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29 <http://en.wikipedia.org/wiki/EPUB>; certain .pdf files are not accessible

30 [http://en.wikipedia.org/wiki/DAISY\\_Digital\\_Talking\\_Book](http://en.wikipedia.org/wiki/DAISY_Digital_Talking_Book)

- consistent designs and cascading style sheets (CSS);
- a clear and logical structure for documents harnessing the potential of headings and subheadings consistently for navigation of a document at a technical and intellectual level;
- fewer frames;
- fewer animations and moving objects;
- contrasting colours<sup>31</sup>.

Assessment accommodations may be required for some students due to different primary modes of communication<sup>32</sup> (i.e. use of keyboard, speech output device), or time constraints that occur when using assistive technology.

### **Considering Modalities**

When considering different modalities:

- research the modalities used by intended participants in the ODL course in the planning stage through conducting a needs analysis;
- field-test the materials with persons with visual, hearing, mobility and learning disabilities to provide insight into the enablers and barriers to address within the course;
- incorporate a wide range of materials that can be accessed in a multitude of ways (UDL principles), which ensures that the modality use of the student participants will be less of a barrier to ODL;
- consider user-friendliness in regards to different modalities in order to ensure that a wide variety of learners are able to participate;
- ensure the materials, including OER and FOSS, are reliable and can be accessed on a consistent basis by the user.

Some accommodation suggestions for students with vision impairments, hearing impairments, mobility difficulties, speech impairments, and learning disabilities are presented in Appendix 1.

Students with hearing impairments, for example, who may have difficulty interacting in on-line discussions or video conferences, however, may be included in these pedagogies through the use of telephone relay services, sign language interpreters and/or open captioning. Alternatively, an online discussion board activity, where all participants respond to threads set by the instructor, may be a more appropriate form of interaction and sharing of ideas.

Resources have been developed to support both the institutions and instructors in making content as accessible as possible. In the USA, for example, all producers and education institutions must comply with legal requirements for accessible content and tools. A tool known as the *Voluntary Product Accessibility Template* [VPAT<sup>33</sup>] (U.S. Department of State, n.d.) assists them by providing a list of the expectations for software and online systems. For educators the *Floe Inclusive Learning Design Handbook* (OCAD University, n.d), an online OER wiki resource, assists in creating adaptable educational resources that can accommodate diverse individual needs.

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31 American Foundation for the Blind (2008)

32 Banerjee & Brinkerhoff (2002)

33 See <http://www.state.gov/m/irm/impact/126343.htm>

## 3.2.2 Implementation Actions

### Using Platforms

During implementation of the ODL course, using a range of platforms or media to provide content to a student in an ODL course will allow many participants the opportunity to access the materials. Access may occur through: computer, tablets/phones and paper-based versions (for students with vision impairments, the contents may be available in DAISY format).

A close examination of the cohort enrolled in the unit will assist the instructor with knowing how they can further assist students. If there are students with specific impairments, they may require specific training to access content via different platforms, including learning management systems (LMS) such as MOODLE.

### Streamlining Content

During implementation, the institution and instructor, preferably in collaboration with industry, should regularly check the accessibility of content, including any OER, FOSS and OA used as a component of the course. Just because content is openly available does not mean it is accessible to everyone. There are a number of openly available tools that allow all parties to assess the accessibility of websites<sup>34 35</sup>. These tools include:

- WAVE<sup>36</sup> and
- W3C Markup Validation Service<sup>37</sup>.

Aspects which may not be accessible include:

- graphics (without text explanations);
- contrasts;
- navigation tools within the site;
- navigation complexity levels.

Regular checks or sampling of the course content can assist with identifying any changes or additional requirements that have not been addressed in the initial design of the course. The instructor may also be able to adjust the content immediately based upon user concerns. Ensuring that users have an accessible way to comment on any difficulties they have with the system will enhance the responsiveness of the instructor. Collecting data about student experiences is important to measure the success of the programme, individual learner satisfaction and future improvements needed.

For implementation to be successful, it is imperative that awareness creation be done through campaigns focused on the target population. For instance, online campaigns can reach many people within a comparatively short period of time and across a greater geographical area.

### Supporting Modalities

During the implementation of the course, access to a help-line or support service will provide students and instructors with assistance if required<sup>38</sup>.

- Information about the support service or assistance available should be made clear to students and instructors prior to the beginning of the course.
- A reasonable alternative to non-accessible content may be provided.

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34 Burgstahler (2002)

35 Roberts & Crittenden (2009)

36 WebAIM (2014)

37 W3C (2012)

38 Chatpakkarattana & Khlaisang (2012)

- Services should be made available in various modes, including video, text and voice feedback to allow for interaction with persons with disabilities.
- At a governmental or systemic level, support is provided for
  - legislation to support access to ODL,
  - requirements for policy at institutional level.
- At an institutional or macro level, support is provided for
  - enrolment processes,
  - development of policy regarding persons with disabilities and ODL overarching learning resources, including additional equipment and training,
  - access to information about the processes employed by the institution.
- At a subject specific or micro level, supports are provided for
  - pedagogy,
  - human and material resources,
  - individual student needs.

### 3.2.3 Monitoring Processes

Monitoring processes are important to assess the ongoing and final outcomes of the ODL and the satisfaction level of users. Processes for monitoring ODL are discussed here in relation to the use of specific platforms, the content of the course and the modalities of the users.

#### Assessing and Adjusting Platforms

Feedback from learners and instructors in regards to the platform used to teach the ODL course will be immediate, as they experience difficulties as soon as they use the platform. Common difficulties experienced include:

- insufficient bandwidth;
- lack of access to the web;
- old technology/software which is not compatible with the ODL material;
- lack of training in how to use the platform;
- lack of knowledge in how to optimize accessibility features of the platform;
- no funding to purchase required software;
- incompatibility between platform and assistive technologies;
- periodic assessment of platforms, content and monitoring processes.

The institution has the responsibility to conduct periodic assessment to determine persistent conformance of accessibility standards.

Governments, institutions and industry all have a part to play in addressing these issues, particularly in relation to infrastructure. Occasionally it may be possible to address issues raised with specific platforms by using free or open source software (FOSS)<sup>39</sup> or by adapting current platforms.

#### Determining Assessing Accessibility and Suitability of Content

Thorough monitoring and support (including metacognitive support and affective support) of participants during the ODL will allow educators to intervene when a user is having difficulty. A series of 'checks' can be built in to the course content that periodically request feedback on experiences from users. These 'checks' are useful for monitoring the progress of all participants, not only those who have disabilities. The nature of technological systems allows the instructor to continually observe progress of the student by examining discussion threads and emails.

39 Abeywardena, I. S. (2012)

Research indicates that persons with disabilities complete courses at a lower rate than persons without disabilities due to a range of factors including accessibility and support. Students who are provided with more support services, including assistive technology, have higher completion rates<sup>40</sup>. When students with disabilities do not complete an ODL course it is important for the government, institution and instructor to determine the cause of the non-completion, it is also important to consider also student attainment and satisfaction so that:

1. measures may be taken in future to address any concerns or issues with access
2. accountability for the education of the person with a disability is transparent.

A mechanism should be included in the ODL course materials that allows users to report difficulties and provide feedback to the instructors, institutions and industry on the accessibility of the course content and, perhaps, on the suitability of the content for the student. Embedded links to survey software, such as free versions of online survey tools can assist students to provide general feedback on courses, while a direct email link can assist in providing more specific or detailed feedback. For ODL courses that contain some face-to-face communication, the educator can question the student/s about the suitability of the course for their needs, both academic and functional.

Thorough monitoring and support (including metacognitive support and affective support) of participants during the ODL will allow educators to intervene when a user is having difficulty. A series of 'checks' can be built in to the course content that periodically request feedback on experiences from users. These 'checks' are useful for monitoring the progress of all participants, not only those who have disabilities. The nature of technological system allows the instructor to continually observe progress of the student by examining discussion threads and emails.

### **Examining Modalities**

Collecting data on a wide variety of user experiences of ODL will enable a government, institution and instructor to compile a database of known difficulties and potential solutions. A database will:

- be useful for current and future users of the ODL,
- assist instructors and developers to troubleshoot difficulties related to modality differences as they arise,
- identify appropriate OER and OA content and FOSS to include.

Re-examining ODL course material on a regular basis to address the experiences of users will strengthen the course for all learners.

Collecting data on platforms/software conformance to technical/accessibility standards will enable government, institutions and instructors ease in procurement decisions.

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40 Moisey (2004)



Female and male teachers teach a girl student using round orange supports.

# Technical Annexes

**Annex 1. Accommodations for Specific Functional Areas**

**Annex 2. List of Available Journals – Open Learning and Distance Education**

**Annex 3. Examples of Free and Open Source Software to assist Persons with Disabilities**

**Annex 4. Glossary**

**Annex 5. Prerequisite Action Checklist**

**Annex 6. Implementation Actions Checklist**

**Annex 7. Monitoring Processes Checklist**

## Annex 1. Accommodations for Specific Functional Areas

Impairment Type	Considerations	Possible Accommodations
<b>Vision</b>	Students may have limited (or no) vision and be unable to view online or printed materials in the same way as others.	<ul style="list-style-type: none"> <li>• Screen Reader Software</li> <li>• E-text reader</li> <li>• Braille Refreshable Display</li> <li>• Text-only browser</li> <li>• Text alternatives for graphics/non-text</li> <li>• Adjust contrast</li> <li>• Information on CD or MP3</li> <li>• Braille print</li> </ul>
<b>Hearing</b>	Students will have difficulty with audio inputs on video or with participating on online or telephone discussions.	<ul style="list-style-type: none"> <li>• Text captioning or transcripts for audio/video (rather than subtitles- which do not convey all information)</li> <li>• Sign language interpreters</li> <li>• Relay service (&amp; TTY)</li> <li>• Printed material</li> </ul>
<b>Mobility</b>	Students may not be able to operate a mouse or keyboard. They may also have difficulty accessing buildings (if required) for any face-to-face course component.	<ul style="list-style-type: none"> <li>• Alternative keyboard (including on-screen keyboards)</li> <li>• Modified mouse or stylus</li> <li>• Speech recognition software</li> <li>• Accessible buildings (ramps, wide doorways, disabled toilets)</li> <li>• Switch interfaces</li> <li>• Page turners</li> <li>• All functions keyboard accessible</li> </ul>
<b>Learning Disability</b>	Students may have difficulty with reading, writing, and processing information quickly or retaining information in the same way as others.	<ul style="list-style-type: none"> <li>• Books on CD, Tablet or USB</li> <li>• Speech output on computer</li> <li>• Speech input to assist with writing</li> <li>• Extra time to read and use materials</li> <li>• Text at an appropriately readable level</li> </ul>
<b>Speech</b>	Students may have difficulty contributing to interactive sessions (e.g. videoconferences).	<ul style="list-style-type: none"> <li>• Use email or a chat room (where the student can type a response) to convey thoughts and ideas</li> </ul>
<b>Other/General</b>		<ul style="list-style-type: none"> <li>• Do not use content that may cause seizures<sup>41</sup></li> <li>• Clearly locate content</li> <li>• Ensure users can operate particular platform</li> <li>• Content must be able to be 'read' by all software (including assistive technologies)</li> </ul>

## Annex 2. List of Available Journals – Open Learning and Distance Education

Journal Title	Subscription Required
<b>American Journal of Distance Education</b> <a href="http://www.tandfonline.com/loi/hajd20">http://www.tandfonline.com/loi/hajd20</a>	Subscription Required
<b>Asian Journal of Distance Education</b> <a href="http://www.asianjde.org/">http://www.asianjde.org/</a>	Not required
<b>Distance Education</b> <a href="http://www.tandfonline.com/loi/cdie20#.U9SzaJ2Q_IU">http://www.tandfonline.com/loi/cdie20#.U9SzaJ2Q_IU</a>	Not required
<b>European Journal of Open and Distance Learning (EURDL)</b> <a href="http://www.euodl.org/">http://www.euodl.org/</a>	Not required (must join mailing list)
<b>Indian Journal of Open Learning (IJOL)</b> <a href="http://journal.ignouonline.ac.in/iojp/index.php/IJOL/index">http://journal.ignouonline.ac.in/iojp/index.php/IJOL/index</a>	Subscription Required
<b>International Journal of Instructional Technology &amp; Distance Learning</b> <a href="http://www.itdl.org/">http://www.itdl.org/</a>	Not required (CC licence)
<b>International Journal of Open &amp; Distance Learning</b> <a href="http://www.scribd.com/doc/27931194/International-Journal-of-Open-Distance-Learning-Third-Issue-April-2010">http://www.scribd.com/doc/27931194/International-Journal-of-Open-Distance-Learning-Third-Issue-April-2010</a>	Subscription required. A subscription to SCRIBD is required to download, but some issues can be read online
<b>International Review of Research in Open and Distance Learning (IRRODL)</b> <a href="http://www.irrodl.org/index.php/irrodl">http://www.irrodl.org/index.php/irrodl</a>	Not required
<b>International Women Online Journal of Distance Education</b> <a href="http://www.wojde.org/">http://www.wojde.org/</a>	Not required
<b>International Journal of E-Learning and Distance Education (formerly Journal of Distance Education)</b> <a href="http://www.ijede.ca/index.php/jde">http://www.ijede.ca/index.php/jde</a>	Not required
<b>Journal of Distance Education in China</b> <a href="http://en.crtvu.edu.cn/index.php/research/journal-of-distance-education-in-china">http://en.crtvu.edu.cn/index.php/research/journal-of-distance-education-in-china</a>	Not required (articles in Chinese)
<b>Journal of Open, Flexible and Distance Learning (formerly the Journal of Distance Learning)</b> <a href="http://deanz.org.nz/the-journal-of-distance-learning/">http://deanz.org.nz/the-journal-of-distance-learning/</a>	Not required
<b>Online Journal of Distance Learning Administration (OJDLA)</b> <a href="http://www.westga.edu/~distance/ojdla/">http://www.westga.edu/~distance/ojdla/</a>	Not required
<b>Open Learning: The Journal of Open and Distance Learning</b> <a href="http://www.tandfonline.com/loi/copl20#.U9S3_J2Q_IU">http://www.tandfonline.com/loi/copl20#.U9S3_J2Q_IU</a>	Subscription Required
<b>Open Praxis</b> <a href="http://openpraxis.org/index.php/OpenPraxis">http://openpraxis.org/index.php/OpenPraxis</a>	Not required
<b>Revista de Educación a Distancia (RED)</b> <a href="http://www.um.es/ead/red/red.html">http://www.um.es/ead/red/red.html</a>	Not required
<b>Turkish Journal of Online Distance Education</b> <a href="http://tojde.anadolu.edu.tr/">http://tojde.anadolu.edu.tr/</a>	Not required

### Annex 3. Examples of Free and Open Source Software to assist Persons with Disabilities

Tool	Function	Link/Source
<b>Audacity</b>	Audio alternatives to written text as audio tracks.	<a href="http://audacity.sourceforge.net/">http://audacity.sourceforge.net/</a>
<b>Balabolka</b>	Convert text to speech using in-built or pre-installed computer voices, usually to create a file for later use.	<a href="http://balabolka.en.softonic.com/">http://balabolka.en.softonic.com/</a>
<b>CamStudio</b>	A video capture tool that digitally records computer screen outputs and allows for the inclusion of audio commentary.	<a href="http://camstudio.org/">http://camstudio.org/</a>
<b>Dasher</b>	An authoring tool for users who cannot use a keyboard but may only be able to control a mouse or joystick. It may be sight controlled by a gaze tracker.	<a href="http://www.bltt.org/software/dasher/">http://www.bltt.org/software/dasher/</a>
<b>DesktopZoom</b>	A zoom/magnify programme. Colours can be inverted and original screen can be made transparent.	<a href="http://users.telenet.be/littlegems/MySoft/DesktopZoom/Index.html">http://users.telenet.be/littlegems/MySoft/DesktopZoom/Index.html</a>
<b>FreeMind</b>	A graphical mind-mapping tool for creating diagrams to connect concepts and ideas. Used for organising ideas and keeping track of all the activities that are involved in completing a task.	<a href="http://freemind.sourceforge.net/wiki/index.php/Download">http://freemind.sourceforge.net/wiki/index.php/Download</a>
<b>KompoZer</b>	A web page creating programme for students and tutors, with accessibility features.	<a href="http://www.kompozer.net/">http://www.kompozer.net/</a>
<b>LetMeType</b>	Autocomplete words regardless of the programme. Offers suggestions by guessing a word after the first two or three letters.	<a href="http://letmetype.en.softonic.com/">http://letmetype.en.softonic.com/</a>
<b>Lingoes</b>	Speaking dictionary which highlights words and has an option to read them aloud. Examples of the use of the word in a sentence are provided.	<a href="http://www.lingoes.net/">http://www.lingoes.net/</a>
<b>Powertalk</b>	Automatically speaks any presentation or slide show running in Microsoft PowerPoint for Windows. Able to speak text as it appears in the presentation and can also speak hidden text attached to images.	<a href="http://fullmeasure.co.uk/powertalk/">http://fullmeasure.co.uk/powertalk/</a>
<b>Sonar</b>	Provides an expanded ring or square around the mouse pointer for users who have difficulty locating the pointer. User can alter the colour and size of the Sonar ring.	<a href="http://www.fx-software.co.uk/assistive.htm">http://www.fx-software.co.uk/assistive.htm</a>
<b>TBar</b>	A coloured bar or block which acts like a coloured overlay, adding a translucent layer over the text. Ruled lines are optional.	<a href="http://www.fx-software.co.uk/assistive.htm">http://www.fx-software.co.uk/assistive.htm</a>
<b>VuBar</b>	Provides an on-screen slotted ruler to highlight and limit the field of view to an area as small as a single line.	<a href="http://download.cnet.com/Vu-Bar/3000-2094_4-10730580.html">http://download.cnet.com/Vu-Bar/3000-2094_4-10730580.html</a>
<b>WordWeb</b>	A one-click English thesaurus and dictionary for Windows that can look up words while the user is working in almost any programme.	<a href="http://wordweb.info/free/">http://wordweb.info/free/</a>

## Annex 4. Glossary

### ➤ Abbreviations

UNCRPD – United Nations Convention on the Rights of Persons with Disabilities

UNESCO – United Nations Educational, Scientific and Cultural Organization

### ➤ Descriptions of the used terms

#### Accessibility

Article 9 of the UNCRPD states: ‘To enable persons with disabilities to live independently and participate fully in all aspects of life, States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others, to the physical environment, to transportation, to information and communications, including information and communications technologies and systems, and to other facilities and services, open or provided to the public, both in urban and in rural areas.’

Accessibility is one of the general principles within Article 3 of the UNCRPD.

Accessible electronic and information technology is suggested by technology that can be used by people of all ages and abilities. Access-IT (The National Center on Accessible Information Technology in Education, USA) suggests: ‘Accessible electronic and information technology:

- It incorporates the principles of universal design;
- Each user is able to interact with the technology in ways that work best for him or her;
- Accessible technology is either directly accessible – in other words, it is usable without assistive technology – or it is compatible with standard assistive technology.’

e-Accessibility describes the need to remove barriers in accessing and using ICT products, services and applications, as well as access to information and knowledge. The 2008 European Council Conclusions on the accessible information society states that: ‘E-accessibility is a necessary prerequisite for a widespread use of ICT, and its cost can be greatly reduced through ‘design for all’ approaches and better interoperability between services and devices.’

#### Assistive Technologies (AT)

BATA (2011) suggests that: ‘AT is any item, equipment, hardware, software, product or service which maintains, increases or improves the functional capabilities of individuals of any age, especially those with disabilities, and enables them more easily to communicate, learn, enjoy and live better, more independent lives’ (British Assistive Technology Association (BATA), 2011).

Assistive technology services can be defined as any service that directly assists an older adult or individual with a disability in the selection, acquisition, or use of an assistive technology device. This includes: evaluation, acquisition, adaptation/modification, co-ordination of therapies, training of end users, families and professionals, provision, maintenance, repair and replacement of accessible information technology. (From the US Assistive Technology Act of 1998, as amended).

**Disability**

The preamble of the UNCRPD recognizes that: 'disability is an evolving concept and that disability results from the interaction between persons with impairments and attitudinal and environmental barriers that hinder their full and effective participation in society on an equal basis with others'.

Article 1 states that: 'Persons with disabilities include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others'.

Discrimination on the basis of disability means: 'any distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis with others, of all human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field. It includes all forms of discrimination, including denial of reasonable accommodation.'

**Inclusive education**

UNESCO (2009) states: 'Inclusive education is a process of strengthening the capacity of the education system to reach out to all learners ... As an overall principle, it should guide all education policies and practices, starting from the fact that education is a basic human right and the foundation for a more just and equal society.' (p. 8).

Inclusive education does not mean that the person with disabilities adapts him/herself to the environment, but implies that adaptations are made to the environment to suit the person with disabilities (in line with the principles of Universal Design as described in Article 2 of the UNCRPD). (UNESCO, 2009. Policy Guidelines on Inclusion in Education, Paris: UNESCO).

**Information and Communication Technology (ICT)**

ICT, refers to equipment and services related to broadcasting, computing, and telecommunications, all of which process, store and transmit information through computer and communications systems.

**Knowledge societies**

Knowledge societies according to UNESCO means societies in which people have the capabilities not just to acquire information but also to transform it into knowledge and understanding, which empowers them to enhance their livelihoods and contribute to the social and economic development of their societies. UNESCO (2010). Towards Inclusive Knowledge Societies. A Review of UNESCO's action in implementing the WSIS outcomes. p. 11.

**Lifelong learning**

The UNESCO Recommendation on the development of adult education (1976) defines lifelong learning as: '*life-long education and learning*, for its part, denotes an overall scheme aimed both at restructuring the existing education system and at developing the entire educational potential outside the education system; creating an understanding of and respect for the diversity of customs and cultures, on both the national and the international planes; in such a scheme men and women are the agents of their own education, through continual interaction between their thoughts 'and actions; education and learning, far from being limited to the period of attendance at school, should extend throughout life, include all skills and branches of knowledge, use all possible means, and give the opportunity to all people for full development of the personality; the educational and learning processes in which children, young people and adults of all ages are involved in the course of their lives, in whatever form, should be considered as a whole'.

**Reasonable accommodation**

Article 2 of the UNCRPD states: 'Reasonable accommodation' means necessary and appropriate modification and adjustments not imposing a disproportionate or undue burden, where needed in a particular case, to ensure to persons with disabilities the enjoyment or exercise on an equal basis with others of all human rights and fundamental freedoms.'

Article 5. 3 states: 'In order to promote equality and eliminate discrimination, States Parties shall take all appropriate steps to ensure that reasonable accommodation is provided.'

Within Article 1 of the UNCRPD it is stated that: 'Discrimination on the basis of disability means any distinction, exclusion or restriction on the basis of disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis with others, of all human rights and fundamental freedoms in the political, economic, social, cultural, civil or any other field. It includes all forms of discrimination, including denial of reasonable accommodation'.

**Self-accommodation**

Learners self-accommodate by learning the computer features that best suit their needs. 'The ability to personalize technology to suit ones preferences and needs is a life-skill that will benefit learners as they progress through the educational system.' (UNESCO, 2012. Accessible ICTs and Personalized Learning for Students with Disabilities: A Dialogue among Educators, Industry, Government and Civil Society. Paris: UNESCO).

**Universal Design**

Article 2 of UNCRPD states that universal design: 'means the design of products, environments, programmes and services to be usable by all people to the greatest extent possible, without the need for adaptation or specialized design. "Universal design" shall not exclude assistive devices for particular groups of persons with disabilities where this is needed.'

Universal Design for Learning is an approach to addressing the diversity of learner needs by suggesting flexible goals, methods, materials, and assessment processes that support educators to meet varied needs. Curricula created using UDL are designed from the outset to meet the needs of all learners. A UDL framework incorporates flexible design of learning situations with customizable options, which allow all learners to progress from their own, individual starting points.

## Annex 5. Prerequisite Action Checklist

### ODL for Persons with Disabilities using Open Solutions Prerequisite Actions Checklist

Prerequisite actions are those that educators and developers must take prior to the dissemination of ODL resources that may be used by persons with disabilities.

#### CHECKLIST

##### Selecting Platforms

- An institutional policy developed through consultation with stakeholders on accessibility developed. This policy should reflect national and institutional legislation as well as wider international policy frameworks.
- Selection and appointment of responsible individual to ensure the implementation of the institutional policy on accessibility.
- Establishment of criteria and procedures for the selection of technology solutions.
- Non-proprietary platforms using FOSS have been considered.
- Consideration given to the types of platforms that users will be accessing (different software, operating systems, desktop devices, mobile devices and/or paper-based).
- Characteristics of the platforms and devices (operating system, language used) have been identified.
- Training required to use the platforms and devices for accessing the ODL platform is available taking into consideration gender sensitive issues.

##### Devising Content

- Accessibility criteria are used in selecting curriculum content and development.
- Mechanisms in place to ensure the achievement of expected learning outcomes for all learners both female and male.
- Available OER and OA resources are included when structuring content.
- Digital and information literacy instruction/training is available and possibly included in the content of the ODL.
- The materials used should be made accessible to all students .
- Alternative access to content is available for students as required.
- Materials reflect non-discriminatory language.
- Materials are made as accessible as technically feasible.
- Materials should meet the standards of Accessible EPub or WCAG2.0AA.
- Assessment accommodations are considered, taking into consideration gender sensitive issues.

##### Considering Modalities

- Universal Design for Learning (UDL) principles as best adapted to delivery of ODL are used .
- Materials are equally available anywhere at any time for all learners.
- Capacity for instructors in different modes of teaching and learning, including ODL is provided.

## Annex 6. Implementation Actions Checklist

### ODL for Persons with Disabilities using Open Solutions Implementation Actions Checklist

Implementation actions are those that educators and developers must take over the duration of the ODL course to ensure the participation of persons with disabilities.

#### CHECKLIST

##### Using Platforms

- Ensure the availability and use of computer, tablet/phone, paper-based materials including taking into consideration gender specificities.
- Ensure students with different modalities are accessing required content.
- Enhance awareness of the needs of the cohort to determine where assistance may be required.
- Identify any training requirements for students, academic and administrative staff.

##### Streamlining Content

- Ensure regular assessment of the accessibility of content (including any OER, FOSS and OA) is undertaken.
- Use tools to assess the accessibility of websites (i.e. WAVE, W3C).
- Identify poorly-accessible components regularly (e.g. graphics, contrast, navigation tools).
- Take timely and effective action on user concerns taking into consideration gender specificities.
- Provide accessible ways of giving feedback and comment to instructors.

##### Supporting Modalities

- Access to a help-line or support service is available to assist students.
- Information about the support service or assistance available is made clear prior to the beginning of the course.
- Provide a reasonable alternative to poorly-accessible content.
- Provide institutional support for enrolment.
- Employ a variety of appropriate pedagogies.
- Take into account the individual needs of the students both male and female.

## Annex 7. Monitoring Processes Checklist

### ODL for Persons with Disabilities using Open Solutions Monitoring Processes Checklist

Monitoring processes are important to assess the ongoing and final outcomes of the ODL and the satisfaction level of users.

#### CHECKLIST

##### Assessing and Adjusting Platforms

- Feedback is gathered from learners and instructors in regards to the platform on a regular basis taking into consideration gender specificities.
- Regular examination of commonly experienced difficulties (for example: insufficient bandwidth, lack of access to the web, old technology/software, lack of training, lack of funding, lack of training and knowledge in accessibility features, incompatibility between platform and assistive technologies or any gender related issues) is undertaken frequently.
- Free or open source software (FOSS) has been considered to address any difficulties encountered.
- Additional platform functionality has been addressed when required (Institutions should advocate vendors to address accessibility issues of their own platforms).
- Free and open source alternatives to the use of some proprietary commercial software have been implemented where needed.

##### Assessing Accessibility and Suitability of Content

- A mechanism (such as an embedded link to survey software) is included in the ODL course materials to allow users to report difficulties and provide feedback on the content and function of the materials.
- Follow-up is conducted with students with disabilities who do not complete an ODL course to determine the cause of the non-completion.
- Strategy developed to investigate reasons of non-attainment and non-attendance, taking into consideration gender aspects also.
- A series of 'checks' are built in to the course content that periodically request feedback on experiences from users.
- Satisfaction data and feedback from students are collected, analysed and finding addressed to improve access to content. Gender sensitive issues are taken into consideration.
- The instructor continually observes progress of the student by examining discussion threads and emails.

##### Examining Modalities

- Data is collected regularly on a wide variety of user experiences of ODL.
- A database has been compiled of known difficulties and potential solutions.
- Appropriate OER and OA content and FOSS to include has been identified.
- ODL course material is re-examined on a regular basis to address the experiences of users and strengthen the course for all learners.
- Data on platforms/software to conform to technical/accessibility standards.

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Open and Distance Learning (ODL), coupled with free and open source software (FOSS), Open Educational Resources (OER) and open access to scientific information (OA), has great potential to enhance educational opportunities for persons with disabilities. Increasing accessibility enhances the efficiency of education courses. In order to fully realize this potential it is imperative that educational institutions, instructors and instructional designers provide accessible materials for students with disabilities and staff with disabilities. On some occasions students with disabilities have reported poor outcomes as a result of low levels of accessibility. Although materials may be available electronically, they may not be accessible to students who use different modalities. Open source tools are available to developers and instructors to support their efforts in ensuring suitability of materials for a wide range of users, and can be used prior to, and during, implementation of ODL courses. These guidelines provide an overview for governments, institutions, instructors and instructional designers, along with quality assurance and qualifications recognition bodies, when developing ODL platforms, processes, courses, examination and other with a view to incorporating the needs of all users.



United Nations  
Educational, Scientific and  
Cultural Organization

Communication and Information Sector  
Knowledge Societies Division  
7, place de Fontenoy  
75352 Paris 07 SP, France



English version:  
<http://www.unesco.org/ict-disability>  
<http://www.unesco-ci.org/ict-pwd/>

French version:  
<http://www.unesco.org/webworld/fr/access-people-disabilities>  
<http://www.unesco-ci.org/ict-pwd/fr>

Spanish version:  
<http://www.unesco.org/webworld/es/access-people-disabilities>



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