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Policy Brief

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ICT AND DISABILITIES IN RWANDA

Contents

1. Preface

This Policy Brief aims at giving an overview of the use of ICT for disabilities in Rwanda by identifying, analyzing and evaluating the different existing national and international policies related to Persons with Disabilities. It states how far Rwanda has gone in terms of Inclusive ICT in Education for Persons with Disabilities. The challenges and opportunities related to ICT accessibility to persons living with disabilities in Rwanda, with an emphasis toward advocacy on accessibility to ICT services and infrastructures is focused on.

The methodologies used are: the identification of all organs/stakeholders that are interested in welfare of persons with disabilities, the desk review using the documentation method by consulting all the existing reports produced by NCPD and policies that have been designed for persons with disabilities, the site visits for observation of existing means like ICT Infrastructure and services accessibility in support of students with disabilities in Rwanda, and interviews with the administration of the NCPD, associations and centres responsible of welfare of disabled persons in Rwanda and the Educational organizations and professionals in Rwanda working with learners with disabilities.

Finally, some recommendations are formulated for the advocacy and the promotion of Inclusive ICT for persons with disabilities in Rwanda

2. Summary

This policy brief focuses on the use of Inclusive ICT by persons with disabilities in Rwanda to enhance the welfare and to support the implementation of the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD, 2006), specifically in-line with Article 9: Accessibility; Article 21: Freedom of Expression and Opinion, and Access to Information; Article 24: Inclusive Education. In-line with Article 9 of the UN Convention on the Rights of Persons with Disabilities, that is (UNESCO, 2014) *"…..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,…."*.

It highlights the challenges and the opportunities related to ICT accessibility of learners living with disabilities in Rwanda, with an emphasis toward advocacy on accessibility to ICT services and infrastructures by identifying barriers faced by learners with disabilities in using inclusive ICT services and equipment, curricula and by promoting specialized training centres and technological innovations to improve the ICT skills status of persons with disabilities and promote inclusive societies toward the specifications.

3. Concepts and Terms

Disability: human limitation of one kind or other, in performing various tasks performed by other human being in general. It may be one or more of the kind of physical, mental or sensory one including visual and hearing

ICT: stands for Information and Communications Technology and is defined as a "*Diverse set of Technological tools and resources used to communicate, and to create, disseminate, store and manage information*" (M.P.Mishra, Sharma, & R.C.Tripathi, 2010).

Inclusion: means the efforts made to include learners with a range of physical, sensory, communication or cognitive disabilities in both learning and wider social opportunities (Becta, 2003). Special needs includes conditions such as dyslexia, physical disabilities, speech and language disorders, visual impairment, hearing loss, difficulties in communication, emotional and behavioral difficulties, and gifted and talented children (Becta, 2003).

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.

Inclusive education: a process of addressing and responding to the diversity of needs of all learners through increasing participation in learning, cultures and communities, and reducing exclusion from education and from within education. The goal is that the whole education system will facilitate learning environments where teachers and learners embrace and welcome the challenge and benefits of diversity. Within an inclusive education approach, learning environments are fostered where individual needs are met and every learner has an opportunity to succeed (UNESCO) The ultimate goal of inclusive quality education is to end all forms of discrimination and foster social cohesion.

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. http://www.bataonline.org/ assistive-technology-definition)

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, coordination 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).

Inclusive Technology: it provides the very best special educational needs software, switches and computer access devices, simple communication aids, and Assistive Technology for learners with a physical disability, sensory impairment or learning difficulty.

4. Introduction

Many studies over the last 30 years have shown that technology can play a significant role in any work with specific disadvantaged groups such as the persons with visual impairments and those with movement disabilities. It can do so in the provision of media to facilitate communication and education (Poon & Head, 1985), but also in other learning. Studies have also shown how ICT can influence the education of learners with Learning Disabilities and have shown that this technology can play an important and useful role (Pillay, 2000; Quinn, 1996).

According to the Rwandan Ministerial order N° 20/18 of 27/7/2009 determining the modalities of classifying persons with disabilities into basic categories based on the degree of disability, in Rwanda context, people with disabilities shall be classified under the following categories:

- Physically disabled persons;
- Sight-impaired persons;
- Deaf-and-dumb persons or persons with either of these disabilities;
- Mentally disabled persons;
- Persons with disabilities not specified in the above categories approved by the Medical committee.

The World Health Organization (WHO) states that 15 per cent of world population is with disabilities. However, Inclusive ICT has the potential for making significant improvements in the lives of these persons, allowing them to enhance their social and economic integration in communities by enlarging the scope of activities available to them. Approximately 10% of the world's population, or 650 million people, live with disabilities, of which 80% live in developing countries. According to the general census of population and housing in Rwanda, 2002, peoples with disabilities are estimated to 308,501, that is 3, 9% of the total population of that time (MINALOC & ADPD/RNDSC, 2010). Persons with disabilities represents 5.02% of the Rwandan Population (National Institute of Statistics of Rwanda, National Population Project 2007-2022, p21, July 2009) as cited in (MINALOC & ADPD/RNDSC, 2010). The current figures from the 2012 Rwandan population census show that there are 446,000 persons with disabilities in the country but that the disability criteria were not clear in some cases. From the 2014 Education Statistical Yearbook of Rwanda Ministry of Education, the pre-primary pupils with disabilities in 2014 are 1387 out of a total of 159291 pupils. The primary school pupils with disabilities in 2014 are 19778 out of 2.399.439 pupils and the overall computer-pupils ration

is 1:14. The secondary school students enrolled with disabilities are 5540 out of 565312 in 2014 and the computer-students ration is 1:32. The Vocational Trainees with disabilities in 2014 are 454 out of 21566 students. The computer student's ratio is 1:18. The tertiary education students with disabilities in 2014 are 188 out of 87013 students

5. International policies

5.1 Rights of persons with disabilities

The UN Convention on the Rights of Persons with Disabilities (UNCRPD) is the primary piece of international law informing national policy on disability affairs around the world. The Convention was adopted by the UN General Assembly in 2006 and became an enforceable legal instrument in 2008. As of September 2010, Rwanda like other 145 countries has signed and subsequently ratified the Convention. The Convention moves towards a view of disability resulting from barriers within society (such as steps at the entrance of a school building for a wheelchair user) and away from the view that disability results exclusively from a person's medical condition.

Through the Preamble of the UNCRPD, stipulating that "*… the importance of accessibility to the physical, social, economic and cultural environment, to health and education and to information and communication, in enabling persons with disabilities to fully enjoy all human rights and fundamental freedoms*" , persons with disabilities are internationally recognized and supposed to be facilitated for good life.

Within the General Obligations of Article 4.1, the requirement to: "*adopt all appropriate legislative, administrative and other measures for the implementation of the rights recognized in the present Convention*" is critical.

The need for progressive implementation towards the achievement of the rights outlined in the Convention is described in Article 4.2: "*With regard to economic, social and cultural rights, each State Party undertakes to take measures to the maximum of its available resources and, where needed, within the framework of international cooperation, with a view to achieving progressively the full realization of these rights, without prejudice to those obligations contained in the present Convention that are immediately applicable according to international law*."

5.2 Domestication of international policies regarding ICT and persons with disabilities in Rwanda

In terms of International Legal and Policy frameworks, the East African Community (EAC) Policy on persons with disabilities (March, 2012) was endorsed by the government of Rwanda. It is clearly stipulated that EAC shall through this policy promote development/establishment of disability user-friendly facilities and infrastructure including education, health, judiciary, transport including air transport, promote the use of sign language, Braille, tactile at EAC level including EAC conferences and establish a tax-free regime on all equipments that facilitate persons with disabilities including equipments and motor vehicles. Rwanda as EAC's member should adopt Inclusive ICT for implementation of that policy especially in education of learners with disabilities. However, the domestication of these and political intent is framed within: Rwanda Constitution; Law on Disability; Ministerial Orders; EDPRS 1 & 2; Policy Frameworks and Ministry Sector Strategic Plans.

In the EDPRS 2 document, disability is considered as crosscutting issue to take into account in all programmatic areas, and it is mentioned that: "*Rwanda does not intend to leave any of its citizens behind in its development. As such, specific steps will be taken to ensure that people with disabilities (PWDs) and other disadvantaged groups are able to contribute actively to the country's development and to benefit from it*".

5.3 International policies vis à vis ICT for persons with disabilities

The General Principles outlined in Article 3 of UNCRPD are clear imperatives for ICT accessibility and Assistive Technology in support of inclusive education.

Three further General Obligations have to be considered important levers for promoting the use of inclusive ICT to support education:

- "*To undertake or promote research and development of universally designed goods, services, equipment and facilities, as defined in Article 2 of the present Convention, which should require the minimum possible adaptation and the least cost to meet the specific needs of a person with disabilities, to promote their availability and use, and to promote universal design in the development of standards and guidelines; In the context of inclusive ICT, Universal Design should apply to: the development of mainstream standards that must have built-in accessibility requirements (for example W3C and EPUB); The design of goods, services and equipment; school environments and procurement; the design of learning environments and educational opportunities*".
- *"To undertake or promote research and development of, and to promote the availability and use of new technologies, including information and communications technologies, mobility aids, devices and assistive technologies, suitable for persons with disabilities, giving priority to technologies at an affordable cost;"*
- *"To provide accessible information to persons with disabilities about mobility aids, devices and assistive technologies, including new technologies, as well as other forms of assistance, support services and facilities.*"

Article 9, on Accessibility, requires the identification and elimination of obstacles and barriers to accessibility, in all possible aspects of the life of a person with disabilities. This includes all forms of educational opportunities:

- The recommended Specific Measures identify action in relation to three areas with relevance to the use of ICTs to support inclusive education;
- To develop, promulgate and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services open or provided to the public;
- To promote access for persons with disabilities to new information and communications technologies and systems, including the Internet;
- To promote the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost;

Two Articles describing Specific Rights for people with disabilities underpin the formulation of the policy on Inclusive ICT in Education:

Article 21: Freedom of expression and opinion, and access to information;

Article 24: Education, which includes not only the right to education per se, but also access to an inclusive education system at all levels and lifelong learning that offers reasonable accommodation to meet individual needs.

Furthermore, Article 26 focusing upon Health and Article 29 focusing upon Participation in Political and Public Life, each refer to the availability of assistive devices and new technologies. Each of these policy sectors requires consideration to ensure co-ordination of all policy goals, as well as all services offered to people with disabilities.

6. Rwanda National Policies

Rwanda has endorsed many legal instruments. The Ministerial Orders, sector policy & strategic plans related to persons with disabilities welfare are plentiful but implementation of several of them is still in early stages or unimplemented. Rwanda (since December 2008) ratified both the UN Convention on Rights of Persons with Disabilities (UNCRPD) and its optional protocol.

Through these legal instruments, Rwanda is fully committed to help persons with disabilities for their inclusion in society. The government has planned different kinds of facilities so that persons with disabilities may be treated like any other person in Rwandese society.

The law No 01/2007 of 20/01/2007 relating to protection of disabled persons in general specifies in article 3 that "*Every disabled person shall be entitled to equal rights with others persons before the law. He or she shall be respected and be entitled to human dignity.*"

In Article 4, it is stipulated that "c*entres or associations which cater for disabled persons are obliged to fulfill the conditions to enable the disabled persons to have a decent living in matters relating to security and health. The centres and associations are required to have sufficient capacity and equipment in order to be able to integrate disabled persons into the social life and to have a role in the development process. The State has the obligation to monitor and support the federations, associations and centres that cater for disabled persons."*

The government of Rwanda through the **NCPD Strategic Plan and its Operational Plan for the Implementation for July 2013-June 2018** in its Strategic Objective 2 envisaged to monitor application of laws and other instruments designed to promote inclusion of people with disabilities in society; and conduct advocacy, with other allies, on issues affecting the development and rights of persons with disabilities.

6.1 Weaknesses of these legal instruments

These legal instruments are silent on inclusive education based on Inclusive ICT while ICT started to be taught in schools some years ago. The use of ICT remained only based on very few applications that are not showing the full integration of ICT in Inclusive and Special Education. The ICT services

and infrastructure (hardware and software) available in schools that learners have access to are mostly not adapted to all the types of disabilities like physical impairment, visual and cognitive impairments. More emphasis is put on learners with visual impairment.

The new competence based curriculum to be implemented in Rwandan twelve basic education systems from 2016 doesn't clearly provide a good environment of teaching and learning for students with disabilities. In planned materials to support education, the Assistive Technology and any other special tool to facilitate the education of students with disabilities are not clearly articulated.

6.2 Expectations in Inclusive ICT

In **ICT in Education Master Plan** which is aligned to the **Smart Rwanda Master Plan**, the **Education Sector Strategic Plan (ESSP)** and the **Draft ICT in Education Policy**, the Government of Rwanda planned to support learners with disabilities by making sure that appropriate accessible and Assistive Technology will be deployed to ensure equality and accessibility are addressed for vision impairments, learning impairments, mobility and dexterity impairments, hearing impairments and deafness, and language impairments.

More effort on the National level is needed for all learners with disabilities in schools to strengthen lifelong learning and to increase their opportunities in Rwanda society as for any other persons. This work deserves great support from Inclusive ICT.

7. Themes of ICT and disabilities in Rwanda

7.1 Research and development initiatives

Normally, research studies are likely to significantly impact on the efficacy of any policy interventions. In general these research studies should aim to establish the current installed bases of ICT in schools at present, the state of current services that could support schools and the attitudes and experiences of teachers and learners in the use of ICT for education of learners with disabilities.

However, there are no available supporting research and development initiatives in teaching and learning of persons with disabilities using ICT in general and Inclusive ICT in particular.

The existence of 43 centres/associations around the whole country should provide the adequate field of experiment with the required data to enrich the research and development in education of persons with disabilities by using inclusive ICT.

The school of Inclusive and Special Needs Education that started in 2014-2015 in University of Rwanda, College of Education in collaboration and partnership with other interested institutions should lead the research and development initiatives by conducting research, disseminating, evaluating and monitoring the findings in the area of inclusive ICT in education of learners with disabilities.

7.2 Stakeholders and consultation

In this policy area, executive consultation with relevant stakeholders helps ensure the policy interventions are implementable and engage properly with the regulatory environment they seek to influence.

7.2.1 Stakeholders

From the NCPD Strategic Plan and its Operational Plan for the Implementation (July 2013-June 2018), in its Annex 5: Annex Five Strategic Issues and details from NCPD stakeholders, Stakeholders include:

- persons with disabilities, their families, careers and advocates;

- national and regional educational authorities, including agencies with a particular remit in this area;
- school boards, teachers and accessible ICT specialists and support staff;
- private and public operators, from Internet service providers to specialist Assistive Technology practitioners and vendors, mainstream ICT providers (local, national or multinational);
- disability service providers;
- Disabled Persons Organizations;

In Law No 01/2007 of 20/01/2007 relating to protection of disabled persons in general, the government of Rwanda reserved a very important place to centres/associations and associations protecting the persons with disabilities. In Article 7, it is stipulated that "*A disabled person is entitled to the right of freedom of expression on any general national issues, on any particular issue he or she is concerned with and shall have a role in the national development of his or her country in accordance with his or her capacity. Where possible, disabled persons shall be consulted and they shall give views on activities and services accorded to them. The Coordinator of the federation of the disabled persons at local levels shall participate in the consultative councils elected at those levels.*"

There are real opportunities for effective mainstreaming of Inclusive ICT in Rwanda because ICT has been considered as one of the pillars of Rwanda Vision 2020.

7.2.2 Consultations

Despite obvious willingness of many structures and organizations, little is known on how to go about disability-related issues. It is why in terms of Inclusive ICT, locally there is no existence of effective dialogue and consultation involving learners with disabilities and other stakeholders of the inclusive ICT eco-system. In some Schools, centres/associations, it is still at its embryonic stage.

The existing associations and centres interested in the education of persons with disabilities are more concerned with other facets than the use of Inclusive ICTs in education. This is due to the lack of competent qualified staff in ICT for persons with disability. The lack of enough ICT resources is also a key factor that plays the role of barrier in implementation of Inclusive ICT in education.

Therefore, in some schools and centres dealing with education of persons with disabilities, there exist some cooperatives of parents, teachers and persons with disabilities. This improves their financial

situation and allows those schools and centres to sustain their programmes of helping learners with disabilities as well as their families.

7.3 Data collection

For the purpose of policy benchmarking, monitoring and evaluation, the government of Rwanda through the Ministry of Education, and the NCPD collects annually data on education in Rwanda in general and on education of persons with disabilities in particular. Therefore, up today, there is no availed data related to Inclusive ICT in Rwanda. However, the Ministry of Health through its health Sector Policy is involved in social integration of people living with disabilities by reducing the mortality and morbidity due to events causing disabilities and in improving access to health services for people with disabilities.

The World Health Organization (WHO) Country Cooperation Strategy 2014-2018 Rwanda through its strategic agenda for WHO cooperation, wants to address the challenges of Noncommunicable diseases, mental health, violence, injuries and Disabilities. There are no clear indications on how learners with disabilities could be helped in learning and teaching by using technology;

7.3.1 Data collected for persons with disabilities

The current figures from the 2012 Rwandan population census show that there are 446,000 persons with disabilities in the country but that the disability criteria were not clear in some cases.

From the 2014 Education Statistical Yearbook of Rwanda Ministry of Education, the pre-primary pupils with disabilities (Hearing, Visual, Speaking, Other Physical, Learning and Multiple disabilities) in 2014 are 1387 out of a total of 159291 pupils where 17.7% have learning disability and 29.4% have other physical disability. The number of children with disabilities enrolled in pre-primary school has increased from 1,153 pupils in 2013 to 1,387 pupils in 2014.

The primary school pupils with disabilities in 2014 are 19778 that represent 0.8% of 2,399,439 enrolled in primary education where 41% have other physical disability, while 17% have learning

disability. The number of males is greater than that of female and between 2013 and 2014 the number of pupils with disabilities has decreased from 21,708 to 19,776. The overall computer-pupils ration is 1:14

Learners with disability are 5540 that represent 0.9% of 565,312 enrolled in secondary education in 2014 where 46.6% of 5,540 learners have other physical disability. The number of learners with disabilities in secondary school decreased from 5,942 in 2013 to 5,540 in 2014. The computer-students ration is 1:32.

The Vocational Trainees with disabilities in 2014 are 454 that represent 2% of 21566 students enrolled in VTCs where 42.7% have other physical disability. The computer student's ratio is 1:18.
The tertiary education students with disabilities in 2014 are 188 that represent 0.2% of 87013 enrolled students where 70.7% have other physical disabilities than the learning disabilities.

The NCPD is providing tangible data on learners with disabilities in universities. The Report from visiting learners with disabilities in universities and high learning institutions produced by the NCPD in December 2012 is giving a comprehensive situation of learners with disabilities.
According to the Field visit report produced in July 2012, some challenges faced by learners are:

- The lack of school fees,
- The inaccessibility of the infrastructures,
- The lack of transport facilities,
- The time allocated to the exams is not enough especially those who have the problem in writing.
- The problem of transport of chairs from one class to another which is a big challenge to the learners who have physical disability,
- There are not known by the authorities,
- The lack of financial support to look for medicines,
- The lack of appropriate accommodation,
- The inaccessibility of the infrastructures,
- The lack of extra time for the learners with problems in writing.
- Learners with hearing and speaking impairment do not have any interpreters. All lecturers do not know sign languages which is a big problem to teach those learners.
- The lack of digital camera to be used,

- There is implementation gap to the Ministerial order concerning learners with disabilities,
- The learners with hearing and speaking impairment are not assisted at all in their education.
- The lack of guidance and cancelling.

7.3.2 Data in Inclusive ICT

The data collection for Inclusive ICT for persons with disabilities lacks the following:

- The current ICT infrastructure within specific school including number of computers and school connectivity to the Internet;
- The types and numbers of accessible ICT required;
- The information affordability and availability in Rwanda of required accessible ICT;
- The efficacy and sustainability of current funding strategies for provision and support of ICT;
- The attitudes, knowledge of learners, of parents and of teachers towards accessible ICT;
- The preparedness of teachers to incorporate accessible ICT into their pedagogical practices;
- The availability of support dedicated networks for teachers and learners;
- Availability of services such as community based rehabilitation services that could potentially support learners and teachers in the use of high and low tech ATs for use in learning environment.

It is clear that most of the learners with disabilities, their teachers and parents are not aware of the importance of Inclusive ICT for their educational system. They have to be sensitized and trained to the use of ICT.

Thus, there is no conducted research for survey on Inclusive ICT for persons with disabilities in formal schools and there is no available data on inclusive ICT for persons with disabilities especially for informal learners scattered in different centres and associations managed by private institutions.

In collaboration between the existing centres and associations of persons with disabilities and the government of Rwanda through NCPD, a survey has to be done to collect data related to inclusiveness of ICT for persons with disabilities.

7.4 Availability of Inclusive ICT to support learners with disabilities in Rwanda education

The technical infrastructure required supporting the use of ICT and the wider Assistive Technology infrastructure is not generally available in most of the schools and centres catering education of persons with disabilities.

The Ministry of Education has programmes in place for the use of ICT in education for persons with disabilities especially those having visual impairments. There are no Assistive technologies related to other kinds of disabilities. Now two problems exist:

- The availability and affordability of robust Assistive Technology solutions for all kinds of disabilities.
- The fact of getting “the right product, via the right person, and with the right instructions and training to the disabled end-user”.

There is a policy in Rwanda Revenue Authority and Rwanda Utilities Regulatory Authority stipulating that the IT equipment is exonerated of taxes. The schools and centres/associations having persons with disabilities in charge should be sensitized that infrastructure for ICT in education for persons with disabilities are tax exempted.

As the Government of Rwanda through the Ministry of Education has a plan to facilitate the acquisition of IT infrastructure and training of users in formal schools, there should be a program to think also about Assistive Technology for inclusive ICT for persons with disabilities. So there is a need of a sustainable funding model for the provision of hardware and software in the schools and centres/associations dealing with persons with disabilities.

The common challenges that all schools and centres/association continue to meet include:

- The high cost and/or availability of suitable ICT, in particular the availability of a□ordable high-tech assistive technologies such as screen readers in the language of the student.
- The provision of unsuitable technology or poor training and follow up support.
- Attitudes of teachers towards the perceived value and potential of the use of ICT by persons with disabilities.
- Poor support for teachers and learners for ICT to be implemented as a pedagogical tool and not just as an add-on to traditional teaching methods

There is a need of a policy for ICT in education for persons with disabilities so that educational authorities can be involved in international cooperation on research into the needs and experiences of both learners and teachers, sharing of experiences and expertise and research into the development of new and better Assistive Technology solutions and service delivery models.

Technology developments that policy makers should monitor include the possible use of cloud computing for the provision of ubiquitous accessible computing and the use of mobile learning. While the latter is particularly interesting for developing countries in which Internet access is limited, accessibility considerations for this mode of distributed learning are still being addressed.

7.5 Support for practice

It relates to the range of supports available to teachers and learners with disabilities. Support required is made of different stakeholders for accessible ICT in education to support services that work directly with children and teachers.

In some schools and centres/associations in charge of persons with disabilities, training of trainers has been conducted on pedagogical issues as well as in basic ICT by considering specific difficulties of a person with disabilities. The focus should be done on:

- Trained teachers in ICT should avail themselves to help disabled persons in ICT use with the hope that their life can improve positively in society.
- A scheme of training of teachers, learners, parents and managers of schools and centres/associations on the teaching methodology of persons with disabilities should be in place at national level with emphasis on Inclusive ICT and their use.

7.6 Curriculum Development

The current curriculum of pre-primary to secondary level that will start in 2016 is competence-based. Learners will be taught by targeting the learning outcomes. This could be facilitated by the use of ICT in each subject for all learners in general and for learners with disabilities in particular.

However the national educational policy should require educational systems to adopt the use of ICT in all areas of curriculum development. ICT can help transform static curriculum resources into flexible digital media. Standards and procedures for the production and/or provision of learning resources should be implemented to ensure they are provided in the required formats in a timely manner.

The four key curriculum areas that educational policy should address and through which ICT skills and literacy can be improved are:

- ICT literacy – ICT skills are taught and learned as a separate subject;
- Application of ICT in subject areas – ICT skills are developed within separate subjects;
- Infusing ICT across the curriculum – ICT is integrated or embedded across all subjects of the curriculum;

- ICT specialization – ICT is taught and learned as an applied subject to train for a profession

There is also a need to improve access to curriculum for learners with disabilities where ICT are a requirement for Open Educational Resources to be made available in accessible formats. National policies and initiatives that require publicly funded websites to be accessible will help improve access to educational resources published online.

Actually, in curriculum design, the Universal Design for Learning (UDL) has to be adopted in educational system. UDL is an emerging and transformative idea which has at its core the development of curriculum that is designed for the outset to meet the greatest number of users, reducing the need for costly and time consuming.

By definition UDL embraces the use of ICT, particularly by persons with disabilities, to access and engage with the curriculum.

8. Recommendations

Inclusive education is a paramount need for all people disregards their sex, age and social membership. The success of inclusive education is possible in Rwanda if inclusive ICTs are promoted and used in specialized schools and centres in education of persons with disabilities. The following are recommended for the establishment of inclusive ICT in education of persons with disabilities in Rwanda:

8.1 For NCPD

- To occupy the chair of Disability Coordination Forum and raise awareness of all stakeholders (Ministry of education, Administrators of schools and centres of persons with disabilities, teachers, parents, organizations of persons with disabilities, learners with disabilities and Civil society) in Inclusive ICT for persons with disabilities, by organizing seminars, workshops and conferences on Inclusive ICT;
- To effectively support educational organizations and professionals in Rwanda working with learners with disabilities to use inclusive ICT to widen participation and increase learning opportunities for learners with disabilities;
- To invest in required infrastructure (hardware and software) for inclusive ICT. The government of Rwanda through NCPD should encourage the initiatives of creation of cooperatives in schools and centres/associations so that they improve their financial situations by facilitating a wide cooperation with internal and external donors/investors in inclusive education;

8.2 For the Ministry of Education (MINEDUC)

- To setup a plan where special space has to be reserved for learners with disabilities by allowing an easy acquisition of appropriate support (hardware and software) for inclusive ICT and the implementation of an effective infrastructure for the use of inclusive ICT in all education settings;
- To avail Inclusive ICT in schools dealing with learners with disabilities to support them in education across different educational and lifelong learning settings. The way Rwanda Ministry of Education is planning to create SMART classroom for conventional schools, has to be the same for schools/centers in charge of learners with disabilities;

- To train trainers and persons with disabilities in Inclusive ICT as a key tool for supporting learners with disabilities to participate in inclusive education and personalized learning opportunities; this should be done by using a cascading training where trainers are trained to finally train others;
- To plan and design a national policy that should emphasize on the compulsory use of inclusive ICT in education so that learners with disabilities are given equal opportunities like other children in schools and in society. MINEDUC has to design that policy where other important stakeholders (UR-CE, schools, centres/associations, civil society, Non-governmental Organizations, UNESCO, etc.) will take part;

8.3 For NCPD

- To make Inclusive ICT more understood as a tool to widen participation and increase educational opportunities and inclusion for learners with disabilities; this should be done through advocacy of NCPD towards Schools and Centres/Associations in charge of learners with disabilities by facilitating the acquisition and the use of Inclusive ICT;
- To encourage effective dialogue and consultation involving learners with disabilities, their parents and representatives in inclusive ICT eco-system; NCPD has to advocate for the creation of a common platform for the community of learners with disabilities by strengthening the federation, association and centres responsible for the welfare of persons with disabilities;

8.4 For University of Rwanda

- To support research and development initiatives that takes 'user involvement' as well as 'user centered approaches to facilitate the learning and teaching of persons with disabilities ;
- To encourage the school of inclusive and special needs education at University of Rwanda-College of Education (UR-CE) and other researchers interested in teaching and learning of persons with disabilities by using inclusive ICT to conduct research and development so that they improve and promote the life of persons with disabilities. The findings should be disseminated through national or international seminars, workshop and conferences;
- To collect Data for policy benchmarking, monitoring and evaluation in educational system where inclusive ICT is a key element for the development of persons with disabilities. The school of

inclusive and special needs education at UR-CE has to work with NCPD, the federation, association and centres responsible for the welfare of persons with disabilities for data collection.

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