Provision of Assistive Resources for Learners with Visual Impairment in Colleges of the University of Rwanda

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Abstract

The purpose of this study was to discuss the provision of assistive learning/teaching resources provided in inclusive colleges of the University of Rwanda. This study adopted the descriptive survey design. The target population was 205 respondents who included deans of schools, resource room managers, lecturers, and students with visual impairments. A sample size of 73 respondents selected through purposive, stratified and simple random sampling techniques was used. Questionnaire and interview guides were used to gather data. The findings revealed that the colleges of University of Rwanda do not have enough assistive learning/teaching resources and some of them are not in working conditions. University management was recommended to enhance the provision of assistive technologies and lecturers were recommended to adapt existing teaching/learning resources to meet the needs of learners with visual impairment.

Key words: provision, assistive resources, visual, impairment, inclusion, Rwanda

Background to the problem

Inclusive education refers to the promotion of specific group of learners mainly but not exclusively learners with disability or learners with special educational needs in the mainstream education (Armstrong, Armstrong & Spandagou (2011). Similarly, inclusive education is defined as the process of responding to diverse needs of all learners. To this end, inclusive education requires to change or to modify structures, content, and teaching/learning strategies to respond to the needs of all children, and in this regard, it is premised on the principles that in education children are endowed with different abilities and that they can experience different learning challenges (Smith, Tom, Allyn & Bacon, 1998). To this end, inclusive education put more focus on specific groups which had limited opportunities to educational services in the past. These groups include children from poor families, marginalized ethnic and linguistic groups, children with special educational needs or with disabilities, and girls in some societies among others (Lewis, 2002).

It is this perspective that Education For All (EFA) movements were therefore launched at the World Conference on Education for All in Jomtien, Thailand in 1990 with the purpose of ensuring that all children, young people and adults have right to education. Later on, the vision of EFA was reaffirmed at Dakar World Education Forum a decade after its declaration (World Education Forum, 2000). During this forum, positive action was called for to address barriers hindering education of children from disadvantaged groups. This was also motivated by the recommendations of the World Conference on Special Needs Education which took place in Salamanca, Spain. This conference recommended that “schools should accommodate all children regardless of their physical,

intellectual, social, emotional, linguistic or other conditions" (UNESCO, 1994). In line with these recommendations, governments started initiating measures to include all children. For instance, in African countries, special needs education has passed through different stages during which education systems explored different ways of addressing children with learning disabilities whereby most of African governments committed themselves to promote SNE. While developed countries have gone beyond the provision of SNE to full inclusion, most of African countries were still lagging behind. To support this idea, Bennet, Bruns and Deluca (1997) emphasize that special needs education is still a new concept in Africa. They emphasize that majority of countries in Africa have mainly shown interest in special needs education through formulation of policies such as mainstreaming, family, community or social rehabilitation and through their effort to give to all children regardless their physical or mental conditions equal opportunities to educational services.

Conversely, starting from France, it is since 18th century that started changing their attitudes towards persons who were bind and the first school for the blind children was established in 178 in France, 1791 in the UK, 1806 in Germany, 1809 in Sweden, and 1829 in the United States (Moodley, 2002). It is to be noted that at regional level, the first school for the blind created in Kenya in 1946 by the Salvation Army. The school started as a vocational school to provide educational services to those who were wounded during Second World War and later it became Thika School for the Visually Impaired. In addition to two integrated programmes, until 1986 it was the only school that was offering secondary school education to the blind in the region. At primary level, there were six schools that were receiving blind people and four integrated programmes (Ministry of Education, 1987).

At national level, the situation of people with disability in Rwanda more or less mirrored that of people with disabilities in other parts of the world. The first special school in Rwanda was established by the Roman Catholic in 1960's at Gatagara, South Province. Since then, other schools for learners with disability were established. However, such schools are still too few to accommodate all learners with special educational needs due to the fact that the society was not considering education for children with disability important. To change this perception, the Rwandan Ministry of Education at the time created the department of special education in 1997 with the mandate to promote special needs education in Rwanda. Likewise, to respond to the needs of students with disabilities, a resource centre was set up at the former Kigali Institute of Education (KIE) in 2000 (Karangwa & Kabano, 2004). The Rwandan constitution of 2003 in its article 40 also provides that education is a right that should be enjoyed by every Rwandan child irrespective of the nature of their needs. To this end, a policy on special needs education was formulated in order to fully implement Article 40 of the 2003 constitution and materialize the government commitment to both International Convention on the Rights of a Child and the African Charter on the Rights and Welfare of a Child (Karangwa & Kabano, 2004). Therefore, Rwanda being a young country in terms of inclusive education, it is encountering challenges. These challenges include among others: inflexible curriculum, inaccessible and unsafe environments, inadequately and inappropriately trained lecturers and overpopulated classrooms (Ministry of Education, 2007). These constraints put learners with visual impairment at a particular disadvantage and it is in

this perspective that the researchers felt that there is need to conduct research in inclusive education colleges of the University of Rwanda with the purpose of assessing the extent to which assistive technologies for learners with visual impairment are provided.

Statement of the problem

Access to education is a fundamental right to everyone and as the constitution of the Republic of Rwanda and other policy documents stipulate education should be provided to all Rwandan children regardless of the nature of their needs. In this regard, learners with visual impairment need to be provided with adequate assistive technologies and staff should be adequately trained to make their inclusion in mainstream education successful (Douglas, Corcoran & Charles, 2007). However, many educational institutions including the inclusive colleges of the University of Rwanda do not have adequate assistive technologies to enable learners with disabilities to learn effectively (Karangwa & Kabano, 2004, Marylyn, 2008). This does not only affect their participation but also their academic performance (Ajuwon & Oyinland, 2008). For instance, as the data from the graduation booklets of 2011 to 2013 indicate many learners with visual impairment learning in inclusive colleges of the University of Rwanda did not perform well in their academic work as compared to their sighted peers. Most of them had a second-class lower division and others only managed to get a pass. Could this poor performance be a result of the assistive learning/teaching resources provided? This study therefore seeks to investigate the provision of assistive learning/teaching provided in colleges of the University of Rwanda that have included students who are visually impaired with the purpose of exploring whether its provision hampers the performance of students with visual impairments.

Purpose of the study

This study aimed at exploring the provision of assistive learning-teaching resources for learners with visual impairment within the inclusive colleges of the University of Rwanda.

Objectives of the study

The specific objectives of this study were:

1. To find out the status of assistive learning/teaching resources provided in inclusive colleges of the University of Rwanda.

2. To find out respondents' views on the adequacy of the assistive learning-teaching resources provided in inclusive colleges of the University of Rwanda.

3. To establish the degree to which lecturers adapt the existing instructional resources to address the needs of learners with visual impairment in inclusive colleges of the University of Rwanda.

Review of related literature

Assistive Technology (AT) refers to any adaptive device or service that enhances inclusion of learners with disability by increasing their participation, achievement or independence (ECTA Centre, 2018). Assistive technologies are very important in inclusive education: they assist learners with visual impairment to increase their access to curriculum and in the long run they improve their academic achievement. Educators therefore have the responsibilities to decide on which devices, tools and technologies are appropriate to meet individual learning needs (ECTA Centre, 2018). It is l this perspective that assistive technologies should give to learners with disability fair advantages and independence to learn competitively with peers.

According to Lewis (2002) assistive technologies such as handheld magnifiers, video systems which magnify printed materials, magnifiers that are attached to eyeglasses as well as other telescopic devices are helpful for learners who are partially sighted. Lewis goes to say that "in addition to these assistive technologies, teachers can also use environmental dimensions such color, contrast, time, illumination, and space to maximize the vision of learners." This therefore requires teachers to assess visually impaired learners to be able to know which color shades they learners can easily see. This is because while some visually impaired learners can easily see bright colours, others can see dull colours with great ease (Keller, 2005).

For Keller (2005), "while learners with low-vision take one and a half times longer to read or complete assignment than their sighted peers, learners using Braille take twice as long." In view of this it is imperative to be aware of this and to accord to them extra time if need be. To emphasize this, Keller adds that visually impaired learners visually get tired, and in some circumstances, they need short breaks, or they opt to use two or more approaches to perform one task. For instance, such learners may need to listen to audio tapes after reading notes. As far as illumination is concerned, it is beneficial to increase lighting for learners with retinal detachments and for leaners with intact cataracts it good to reduce lighting or lighting from behind (Keller, 2005). Another alternative to assist learners with visual impairment is changing positions in the classroom. For instance, it would better for a learner with poor distance acuity to sit at the front of the class in order to study and perform well. Furthermore, it is beneficial for learners with visual field loss to sit in a seat that favours other fields. For instance, it is advisable that a learner who has lost the left field of vision sits on the left side of the classroom to be able to see his/her classmates. Likewise, a learner who has lost his/her central field of vision can use eccentric viewing (Keller, 2005).

Changing the size of the print can be another dimension of space to be considered in order to assist learners with visual impairment. Some learners may benefit from enlarged print and specialized optical devices such as Merlin is useful to either enlarge or reduce the size of items (Keller, 2005). Another device to enlarge text is an opaque projector. In a study conducted in UK, it was found that learners with partial sight benefitted much from increased letter spacing (Lewis, 2002). The study further adds that this helps teachers to save time used to assist such learners. Unlike the partially sighted learners, learners who are blind rely on other senses such as tactile. The most commonly known medium used for reading is 'Braille'. To this end, braille writing is done by using a slate and

stylus. In addition to this, Braille and Speak is another innovative medium for people who are blind. According to Hardman, Drew and Egan (2005) Braille and Speak is a small braille note taker powered with battery that is used to translate braille into synthesized speech or print through a small keyboard to enter data and voice output.

Another tactile device is the Optacon Scanner. With this device "printed material is exposed to a camera that produces the printed material on a finger pad by using a set of vibrating pins and this pins are tactile reproductions of the print." Likewise, JAWS for Windows is another powerful program that converts texts displayed on the computer screen into speech to enable people who are blind read (Albertter & Hartleys, 2002).

While strong training in the field of special education enhances understanding and improves attitudes towards inclusion, introductory courses offered in teacher preparation programs are sometimes inadequate to prepare the general educator for successful inclusion (Van Reusen, Shoho and Barker 2001). They concluded that teacher's qualification level does not significantly influence teacher's attitude towards the inclusion of students with disabilities into regular classes. Conversely, the study by Stoler (1992), revealed that teachers with high level of education have less positive attitudes towards inclusion than those with low level of education. Likewise, Kuroda, Kartika & Kitamura (2017) emphasize that schools receiving systematic training and support demonstrate positive attitudes towards inclusive education and more confidence in methods of teaching students with disabilities.

The contribution of all of the above-mentioned innovations to the learning of learners with visual impairment in inclusive education is significantly recognized. However, it is better that learners with visual impairment first enrol to special school in their early years of education in order to get skills enabling them to use specialized equipment effectively (Lewis, 2002). Furthermore, in the mainstream schools, materials should also adapted to meet the needs of all learners. To this end, Allwright (1990) argues that "materials should teach students to learn, they should be resource books for ideas and activities for instruction/learning, and they should give teachers rationales for what they do." In the same vein, Idol (2006) confirms that "material may be suitable for students' needs, even if they are not designed specifically for them." For Idol, these materials include textbooks, video tapes, computer software and visual aids. From this perspective, it is therefore very important to provide learning /teaching assistive devices to learners with visual impairment so as to give them an opportunity to achieve academically as compared to their peers. To this end, Ahmed (2018) confirms that assistive technology assist learners with disabilities because they enable both learners and teachers to create a powerful learning environment.

Methodology

This study adopted a descriptive survey design, and it was carried out at the University of Rwanda's College of Arts and Social Sciences which is located in Huye District, Southern Province, and at its College of Education located in Gasabo District, Kigali city. The two colleges were chosen because they are the only colleges of the University of

Rwanda that practice inclusive education. A sample size of 73 respondents was used, including 6 deans, 4 resource room managers, 18 students with visual impairment, and 45 lecturers. To obtain this sample, purposive sampling was used for deans, resource room managers, and students with visual impairments and stratified as well as simple random sampling were used to select lecturers. To collect data from this sample, different documents were reviewed, deans and resource room managers were interviewed, and questionnaires were administered to students with visual impairment as well as to lecturers. All questionnaires were returned. Content validity was checked to ascertain whether all questionnaire items were suitable for their purpose. To calculate the reliability of the research instruments, Spearman rank order correlation coefficient was used. The correlation coefficients obtained were 0.829 and 0.801 for both lecturers' and students' questionnaire respectively, hence the instruments were reliable. Descriptive statistics such frequencies and percentages were used to analyse quantitative data qualitative data were manually analysed using thematic approach. The findings were presented in tables and verbatim.

Presentation and discussion of the findings

The study evaluated the Provision of assistive learning/teaching resources for learners with visual impairment in the two inclusive colleges of the University of Rwanda: College of Arts and Social Sciences and College of Education. This section presents the findings in accordance with the objectives of this study.

1. Assistive learning-teaching resources provided in inclusive colleges of the University of Rwanda

The first objective of this study was to find out the status of assistive learning/teaching resources provided in the two inclusive colleges of the University of Rwanda. The following table summarizes the type, quantity and status of assistive learning/teaching resources provided in the two inclusive colleges of the University of Rwanda.

S/N	Assistive learning/teaching resource	Status		Total
		Functioning	Not Functioning	
1	Victor Readers	7	21	28
2	Braillino	7	7	14
3	Braille display	4	1	5
4	Perkins Braille	21	9	30
5	Computer -Laptop	5	8	13
6	Computer -Desktop with JAWS	14	17	31
7	Braille embossers	4	2	6
8	Smart View	15	3	18
9	Talking calculators	10	0	10
10	Scanner	1	1	2

Table 1 indicates that all resource rooms in the two colleges of the University of Rwanda are equipped with assistive technologies. However, the table revealed that some of the assistive technologies provided are not in working conditions, i.e. they are damaged and students cannot use them for academic purposes. During the interview with

resource room managers, it was revealed that in addition to some resources being in a not functioning status; there are some resources that students do not use because they have never been trained on how to use them. This may therefore affect their learning. It is to be noted that learners with visual impairment are advised to attend special schools in their early years of education where they can be familiar with some specialized equipment (Lewis, 2002).

2. Views of respondents on the adequacy and suitability of the assistive learning-teaching resources provided in inclusive colleges of University of Rwanda

The second objective was to find out the views of learners with visual impairment (VI) on the adequacy and suitability of the available assistive learning-teaching resources. The following table presents the findings on adequacy of the provided assistive learning-teaching resources.

Table 2 Views on adequacy of the assistive learning/teaching resources provided for students with VI

Are the resources provided enough for all students with VI?	Frequency: n=18	Percentage
Yes	4	22.2
No	14	77.8
Total	18	100%

Table 2 shows that 14 (77.8%) of students with VI said that the assistive learning/teaching resources provided are not enough while only 4 (22.2%) confirmed that the provided assistive resources are enough. This is in agreement with the views of both the deans and resource room managers who during the interview revealed that the assistive learning/teaching resources provided are not enough for all students with visual impairment. One of them from the College of Education revealed that in the following as follows:

> "*The materials provided are not enough for all students. Some students are forced to share one victor reader and this becomes a challenge when the two students have lessons at the same time and may be one is in level one and the other one level two or they are in the same level but taking different subjects. The Braille machines are not enough and students shy off taking them to class because of the noise they produce and also some lack competence in using them. They fear that the noise produced by these machines may disturb the rest of the students."*

Another one from the College of Arts and Social Sciences had this to say:

> "*There are not enough assistive technologies for learners with visual impairment. For example, although some students with visual impairment are not competent in using Braille machine, they are very few in the resource room, furthermore there are few victor readers and most them are not in working conditions."*

Another one from the College of Education added:

> *"I think there is need to provide more assistive technologies. For instance, the resource room does not have enough braille machines, when mine is broken it is hard to get another one to use. Sometimes*

one braille machine is shared by two or three students! The same to the victor readers and this is a big challenge especially when we need them at the same time. It is really challenging."

This inadequate provision of assistive learning/teaching resources may affect the performance of students with visual impairment. To this end, Marylyn (2008) found out that access by learners with visual impairment to textbooks and teaching/learning resources in the appropriate media and at the same time with their peers who are sighted is an important aspect of accommodation. This implies that braille or recorded media and large print text or optical devices are used in class for learners who are blind and for learners with low vision respectively. This is supported by the findings Allwright (1990) who found that instructional materials should be designed in such a way that they assist learners to learn and they justify what teachers do. However, this was contradicted by Idol (2006) who asserts that instructional materials such textbooks, video tapes, computer software and visual aids may be suitable for students' needs even when that they are not adapted.

Regarding the conditions of the available assistive learning/teaching resources, all deans and resource managers confirmed that some materials had broken down and were not in use because there were no technicians to repair them. They had also confirmed that some materials which the resource room managers had no knowledge on how to use them and this affected the academic performance of students with visual impairments because they could not introduce the materials to them. To ensure that assistive technologies function well, Simon et al (2010) say that the users of equipment and the maintenance team should be trained to have enough skills to maintain and pair repair such equipment.

3. Adaptation of teaching-learning resources to address needs of learners with visual impairment

The third task of this study was to find out whether lecturers adapt available teaching/learning resources in order to respond to the needs of learners with visual impairment. The following table presents the findings on that issue.

Table 3 Adaptation of teaching-learning resources to meet the needs of learners with VI

In your lecture, do you adapt teaching/learning resources to meet the needs of learners with VI?	Frequency: n=45	Percentage
Yes	3	6.7
No	42	93.3
Total	45	100%

Table 3 shows that 42 (93.3%) of lecturers confirmed that they never adapt learning/teaching resources to respond to the needs of learners with visual impairment while 3 (6.7%) of them said that they adapt learning/teaching resources to meet the needs of students with V.I. This is due to the fact that most of the lecturers are not trained in the area of SNE and therefore they have no idea on how the adaptations can be done. During the interview, the majority of the deans suggested that the teaching staff should be provided with trainings to equip them with knowledge and skills to

assist students with visual impairment. It is to be noted that teachers are required to manage the classroom in such a way that the needs of each and every learner are met (Carmen, 2014). In the same vein, Doorlag and Lewis (1999) and UNESCO (2005) suggested that to assist learners with visual impairment by providing extra instructions or assistance especially in areas where they mostly challenged.

Conclusion and Recommendations

The main purpose of this paper was to discuss the provision of assistive learning/teaching resources for learners with visual impairment within the two inclusive colleges of the University of Rwanda. From the findings of the research, it was concluded that like elsewhere as it was highlighted in the literature review the two colleges are not sufficiently provided with assistive learning/teaching resources and even some of the provided learning and teaching resources are not in working conditions. It was also concluded that the majority of lecturers in the two inclusive colleges of the University of Rwanda never adapt teaching and learning resources to respond to the needs of learners with visual impairment. Basing on these conclusions, the management of University of Rwanda was recommended to increase the provision of assistive learning/teaching resources in the two colleges, to train both students with visual impairment and the staff on how to use different assistive resources, and to hire a technician who can repair the available assistive technologies once they are damaged. It was also recommended that university lecturers at the two colleges of the University of Rwanda should adapt all their teaching and learning resources to cater for the needs of learners with visual impairments.

References

Ahmed, A. (2018). Perceptions of Using Assistive Technology for Students with Disabilities in the Classroom. *International Journal of Special Education*. 33 (1) 129-139.

Ajuwon, P. M. & Oyinland, A. O. (2008). Educational placement for children who are blind or have low vision in residential and public schools: A national study of parents' perspectives. *Journal of Visual Impairment and Blindness,* 102(6), 325-339.

Allwright, R. L. (1990). *What do we want teaching materials for? In R. Rossnerand R. Bolitho, (Eds), Currents in language teaching*. London: Oxford University Press.

Arbetter, S. & Hartleys (2002). Teachers and Pupils Experience of Integrated Education in Uganda. *International Journal of Disability, Development of Education.*

Armstrong, D., Armstrong, A.C., & Spandagou, I. (2011). Inclusion: By choice or by chance? *International Journal of Inclusive Education*. 15(1) 29-39.

Barton, L. (2009). *Policy Experience and Change: Cross Cultural Reflections on Inclusive Education*. Springer, Netherlands.

Bennet, T., Bruns, D. & Deluca, D. (1997). *Putting Inclusion into practice Perspective of teachers and parents:* Exceptional Children

Carmen, W. (2014). *Role of the Classroom Teacher.* London: University of Roehampton

Diana, P.C. (2008). *Foundation of Disability awarenesss*. Carfornia: University of San Diego.

Doorlag, D. H. & Lewis, R. B. (1999). *Teaching special learners in general education classrooms* (5th ed.). Upper Saddle River, N. J: Merrill.

Douglas, G., Corcoran, C., & Charles, N. (2007). Editorial-Special Issue on Social Inclusion and Visual Impairment. *British Journal of Visual Impairment*, 25(2), 2-4.

ECTA Centre (2018). What is Assistive Technology? Available from www.ectacenter.org.

Hardman, M. L. Drew, C. & Egan, M. W. (2005). *Human exceptionality: Society school and family (6th Ed)*. Boston: Allyn and Bacon.

Idol, L. (2006). Toward inclusion of special education students in general education. *Remedial and special education,* 27, 77-94.

Karangwa, E. & Kabano, J. (2004). *Special needs education module*. Kigali: Kigali Institute of Education.

Keller, E. (2005). *Strategies for teaching learners with visual impairments*. Retrieved from http://www.as.wvu.edu/vision.htm.6 May 2016.

Kuroda, K., Kartika, D., & Kitamura, Y. (2017). *Implications for Teacher Training and Support for Inclusive Education in Cambodia: An Empirical Case Study in a Developing Country*. JIKA-RI Working Paper. JICA Research Institute.

Lewis, S. (2002). Some thought in inclusion, alienation and meeting the needs of children with visual impairment. *Review*, 34(3), 99-101.

Marriam, S.B. (1998). *Qualitative research and case study applications in education.* San Fransisco: Jossey-Bass Publishers.

Rwanda Ministry of Education. (2007). *Teacher Development and Management Policy in Rwanda.* Kigali-Rwanda.

Kenya Ministry of Education. (1987). *Education in Kenya Information handbook*. Jomo Kenyatta Foundation.

Marlyn, (2008). *Special Education in Contemporary Perspectives for Specials school Professional.*Boston: Pearson Education .

Moodley, S. (2002). *The impact of different reading/ writing media on the education of the blind persons.* Unpublished PhD thesis, South Africa: University of South Africa.

Oliver, M. & Barnes, C. (1998). *Disabled People and Social Policy*: From Exclusion to Inclusion. Harlow: Longman.

Rieser, R. (2002). *Medical and social model of disability*. http//inclusion.Uwe.Ac.Uk/inclusionweek/articles/socmod.Html. Retrieved on 24th May 2013

Rex, E. J, Koening, A. J., Wormsley, D. P., & Baker, R. L. (1995). *Foundations of braille literacy*. New York, AFB Press.

Powdrill, S., Cordero, I. and Srinivasan, V. (2010). *Training for equipment maintenance and repair.* University of Kentucky College of Health Sciences

Simon, C., Echeita, G., Sandoval, M. & Lopez, M. (2010). The Inclusive Education process of students with visual impairment in Spain: *An analysis from the perspective of organization*

Smith, Tom E.C, Allyn & Bacon (1998). *Teaching students with special needs in Inclusive Settings*. New Jersy, Prentice Hall.

Stoler, R.D. (1992). Perceptions of regular education teachers towards inclusion of all handicapped students in their classrooms. *Clearing House, 66, 60-63.*

UNESCO (2005). *Guidelines for inclusion: Ensuring Access to Education for All.* Paris: UNESCO.

UNESCO (1994). *The Salamanca statement and framework for action on special needs education adopted by the world conference on special needs education: Access and quality.* Salamanca, Spain, 7-10 June 1994. Paris, UNESCO Retrieved from: www.unesco.org/education/pdf/SALAMA_E.PDF+unesco+salamanca+statement&hl=en

Van Reusen, A. K., Sholo, A. R. & Barker, K. (2001). High School Teacher attitudes toward inclusion. *The high school journal*, 84, 7-18.